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THE IMPACT OF DIFFERENTIATED INSTRUCTION ON STUDENTS' ACTIVENESS AND LEARNING MOTIVATION IN ELEMENTARY SCHOOL PHYSICAL EDUCATION

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ABSTRACT

Introduction: Physical Education (PE) in elementary schools plays a crucial role in developing students' fundamental motor skills. Among the various topics taught, volleyball underhand passing is a fundamental technique that requires good coordination and body control. However, the diverse physical abilities of students often pose challenges for teachers, leading to low activeness and motivation in class. Differentiated instruction offers a potential solution by adjusting content, process, and product based on student readiness.

Objective: This study aims to analyze the impact of differentiated instruction on students' activeness and learning motivation in elementary PE, specifically focusing on the teaching of volleyball underhand passing.

Methods: A quasi-experimental design (non-equivalent control group) was employed. The sample consisted of 54 fifth-grade students from SDN Rangkah 6/168 Surabaya, divided into an experimental group (n=27) receiving differentiated instruction and a control group (n=27) receiving conventional instruction. Data were collected using an activeness observation sheet and the ARCS motivation questionnaire. The intervention was conducted over four sessions focusing on volleyball underhand passing techniques. Data were analyzed using paired t-tests and ANCOVA.

Results: The experimental group showed a significantly higher increase in activeness (mean difference = 7.25) and motivation (mean difference = 10.20) compared to the control group (1.30 and 0.74, respectively). The ANCOVA test confirmed a highly significant difference between groups ($p < 0.001$).

Conclusion: Differentiated instruction significantly improves students' activeness and learning motivation in elementary PE, particularly in learning volleyball underhand passing. Teachers are encouraged to apply this approach to accommodate diverse student abilities in motor skill learning.

Keywords: Differentiated Instruction; Student Activeness; Learning Motivation; Physical Education; Volleyball Underhand Passing.

1 INTRODUCTION

Physical Education (PE) is a compulsory subject that plays a vital role in promoting students' physical, cognitive, and social development [1]. In the context of elementary education, PE provides the foundational movement skills necessary for lifelong physical activity. One of the fundamental motor skills taught in elementary PE is volleyball. Volleyball is a team sport that requires specific technical skills, and one of the most critical basic techniques is the underhand passing [2]. Mastering this technique is essential for students to control the ball and participate effectively in the game. Recent studies have highlighted the effectiveness of Differentiated Instruction (DI) in physical education, particularly through the use of modified equipment (e.g., rubber balls) and adjusted task progressions, to accommodate varying skill levels and make the learning process more effective for beginners [3, 4].

However, teaching volleyball underhand passing to elementary school students presents significant challenges. Students in a single classroom often have varying levels of physical fitness, motor coordination, and prior experience with the sport. A conventional, one-size-fits-all instructional approach often fails to accommodate these diverse needs, leading to passive learning, reduced motivation, and unequal skill acquisition [5]. Many students, particularly those with lower coordination or less confidence, may feel frustrated and disengaged when the instruction is too difficult or too monotonous.

Differentiated instruction has emerged as an innovative pedagogical approach to address this challenge. By adjusting the content (e.g., modifying the ball size), process (e.g., varying the types of drills and group work), and product (e.g., flexible assessment), teachers can tailor the learning experience to meet individual student needs [4]. In the context of physical education, differentiated instruction has been recognized as an effective learning management strategy to accommodate student diversity [6, 7]. Furthermore, differentiation allows teachers to provide different tiers of tasks—for instance, using lighter or larger balls for beginners, or providing more advanced drills for those who have mastered the basics [8].

Despite the theoretical benefits, research specifically examining the implementation of differentiated instruction in elementary school PE, particularly in the context of specific motor skills like volleyball underhand passing in Indonesia, is still limited. Most studies focus on general subjects or cognitive outcomes [9]. Moreover, the urgency of implementing differentiated instruction is also driven by the need to improve 21st-century teacher competencies, which are often constrained by a lack of training and resources [10]. Therefore, this study aims to fill this gap by analyzing the impact of differentiated instruction on students' activeness and learning motivation in elementary PE, with a specific focus on volleyball underhand passing.

2 MATERIAL AND METHODS

2.1 Research Design

This study employed a quantitative approach with a quasi-experimental design, specifically the non-equivalent control group design. This design was chosen to test the effect of the intervention (differentiated instruction) on student activeness and motivation [11].

2.2 Population and Sample

The population consisted of all fifth-grade students at SDN Rangkah 6/168 Surabaya, East Java, Indonesia. The sample was selected using a purposive sampling technique, which is suitable for quasi-experimental research to ensure the availability of parallel classes with equivalent initial abilities. The sample resulted in two parallel classes: the experimental group (n=27) and the control group (n=27), with a total of 54 students. Both groups were selected from parallel classes with comparable initial abilities based on the school's academic records. The pretest scores were used as covariates in the ANCOVA analysis to control for any potential initial differences between groups.

2.3 Variables and Instruments

The independent variable was differentiated instruction, applied specifically to the teaching of volleyball underhand passing. Differentiation was implemented through:

- Content: Modifying the type of balls used (e.g., lighter plastic balls) for students with lower coordination.
- Process: Varying the drills (e.g., individual passing against the wall, paired passing with a partner, and small-sided games) based on students' readiness levels.
- Product: Providing flexible assessment criteria based on individual progress rather than a uniform standard.

The dependent variables were:

- Student Activeness: Measured using an observation sheet based on a 1-5 Likert scale, covering aspects of active participation, group interaction, and task involvement in passing drills. The instrument was validated by PE experts (Cronbach's Alpha > 0.80). Observations were conducted by two independent observers.
- Learning Motivation: Measured using the ARCS (Attention, Relevance, Confidence, Satisfaction) questionnaire adapted for the PE context, consisting of 20 items with a 1-5 Likert scale [12].

2.4 Procedure and Data Analysis

The study was conducted over 6 sessions. The first session involved a pretest (observing initial passing skills and administering the motivation questionnaire) for both groups. Subsequently, the experimental group received differentiated instruction for four sessions (focusing on volleyball underhand passing), while the control group received conventional instruction (traditional drill-based approach with uniform equipment and standards). The final session involved a posttest. Data were analyzed using SPSS version 25.0. Prerequisite tests (normality and homogeneity) were conducted, followed by Paired Sample T-Tests and ANCOVA (Analysis of Covariance) with pretest scores as covariates.

3 RESULTS

The descriptive statistics (Table 1) showed that both groups experienced an increase from pretest to posttest. However, the increase in the experimental group was substantially higher. For the activeness variable, the experimental group showed a mean difference (Δ) of 7.25, while the control group only increased by 1.30. Similarly, for learning motivation, the experimental group increased by 10.20 points, whereas the control group only increased by 0.74 points.

Table 1: Descriptive Statistics

Variable	Group	N	Mean Pretest	Mean Posttest	SD Pretest	SD Posttest	Δ (Difference)
Activeness	Experiment	27	64.25	71.50	2.12	2.05	+7.25
	Control	27	63.80	65.10	3.25	5.51	+1.30
Motivation	Experiment	27	65.50	75.70	2.18	2.12	+10.20
	Control	27	65.10	65.84	2.82	3.45	+0.74

The prerequisite tests showed that the data were normally distributed (Shapiro-Wilk, $p > 0.05$) (Table 2) and homogeneous (Levene's test, $p > 0.05$) (Table 3).

Table 2: Test of Normality (Shapiro-Wilk)

Variable	Group	Statistic	df	Sig.	Conclusion
Pretest Activeness	Experiment	0.968	27	0.245	Normal
	Control	0.972	27	0.382	Normal
Posttest Activeness	Experiment	0.961	27	0.152	Normal
	Control	0.978	27	0.215	Normal
Pretest Motivation	Experiment	0.975	27	0.198	Normal
	Control	0.965	27	0.162	Normal
Posttest Motivation	Experiment	0.981	27	0.422	Normal
	Control	0.982	27	0.512	Normal

Table 3: Test of Homogeneity (Levene's Test)

Variable	F	df1	df2	Sig.	Conclusion
Posttest Activeness	0.210	1	52	0.648	Homogeneous
Posttest Motivation	0.154	1	52	0.696	Homogeneous

The Paired Sample T-Test results for the experimental group (Table 4a) revealed a highly significant difference ($p < 0.001$) for both activeness and motivation, indicating that differentiated instruction was internally effective. In contrast, the control group (Table 4b) showed no significant difference ($p > 0.05$).

Table 4a: Paired Sample T-Test (Experimental Group)

Variable	Mean Pre	Mean Post	t	Sig. (2-tailed)	Conclusion
Activeness	64.25	71.50	-18.15	0.000	Significant
Motivation	65.50	75.70	-24.25	0.000	Significant

Table 4b: Paired Sample T-Test (Control Group)

Variable	Mean Pre	Mean Post	t	Sig. (2-tailed)	Conclusion
Activeness	63.80	65.10	-1.72	0.097	Not Significant
Motivation	65.10	65.84	-1.61	0.118	Not Significant

Furthermore, the ANCOVA test (Table 5), controlling for pretest scores, confirmed a highly significant difference between the experimental and control groups for both variables ($p < 0.001$). This proves that differentiated instruction is significantly more effective than conventional methods.

Table 5: ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model (Activeness)	655.120	2	327.560	82.450	0.000
Group (Activeness)	580.450	1	580.450	146.120	0.000
Corrected Model (Motivation)	1150.320	2	575.160	125.200	0.000
Group (Motivation)	1050.850	1	1050.850	228.775	0.000

(Note: Pretest scores were used as covariates)

4 DISCUSSION

The findings of this study indicate that differentiated instruction has a significant positive impact on students' activeness and learning motivation in learning volleyball underhand passing. The experimental group, which received instruction tailored to their readiness, demonstrated much higher engagement. This aligns with previous research stating that differentiated instruction accommodates diverse ability levels, allowing all students to participate actively without feeling overwhelmed or bored [13, 14].

In the context of volleyball passing, differentiation is particularly crucial. The underhand pass requires precise timing and coordination, which can be frustrating for beginners. By modifying the content (using lighter or larger balls) and the process (allowing students to pass against a wall before passing with a partner), teachers can scaffold the learning experience. This is in line with the findings of Parman et al. [15] and other recent studies, which emphasize that modifying equipment and tasks is highly effective for teaching underhand passing to elementary students. This scaffolding increases students' confidence (one of the ARCS dimensions), leading to higher motivation and a greater willingness to practice [12].

Furthermore, these results support the recent systematic literature review by [16], which highlighted a strong relationship between differentiated instruction, physical fitness, and learning motivation in PE. The significant increase in the experimental group's ARCS scores suggests that when learning activities are relevant to students' interests and allow them to experience success, their overall motivation to learn increases. In the context of PE, differentiating the process allows students to experience success without feeling overwhelmed [8].

Conversely, the control group, which received conventional instruction, showed minimal improvement. The conventional approach often relies on uniform drills (e.g., all students using standard-sized balls and performing the same repetitive exercises), which fails to address the wide variance in motor skills among elementary students [5]. This uniform approach can lead to disengagement and lower motivation, especially for students who struggle with the technique.

5 CONCLUSION

In conclusion, the application of differentiated instruction significantly improves student activeness and learning motivation in elementary PE, specifically in mastering volleyball underhand passing. The experimental group demonstrated substantially higher gains compared to the conventional group.

This study recommends that PE teachers adopt differentiated strategies when teaching specific motor skills like volleyball passing. By modifying the content, process, and product, teachers can create a more inclusive and engaging learning environment. Future research could explore the effect of differentiated instruction on actual motor skill acquisition (e.g., passing accuracy) using more specific skill tests.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare no conflicts of interest regarding the publication of this paper.

Statement of ethical approval

This study was approved by the Ethics Committee of Universitas Negeri Surabaya. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional research committee.

Statement of informed consent

Written informed consent was obtained from the parents or legal guardians of all participating students prior to the study. The purpose and procedures of the research were explained to them, and they were assured that participation was voluntary and that data would remain confidential.

REFERENCES

[1] Riwu, B. (2017). Kinerja Guru Pendidikan Jasmani Dalam Meningkatkan Prestasi Belajar Siswa. Prosiding Seminar Nasional Profesionalisme Tenaga Profesi PJOK, 1-8.

[2] Ahmadi, N. (2007). Panduan Olahraga Bola Voli. Surakarta: Era Pustaka Utama.

[3] Özbal, A., et al. (2019). The Application of Differentiated Learning in Physical Exercise and Sports Learning in Grade 5 Elementary School. Pamukkale Journal of Sport Sciences, 15(3), 561-577.

[4] Tomlinson, C. A. (2001). How to Differentiate Instruction in Mixed-Ability Classrooms. ASCD.

[5] Nopiyanto, Y. E. (2020). Hambatan Guru Pendidikan Jasmani Generasi 80-an dalam Pembelajaran Daring. Jurnal Sporta Saintika, 5(2), 139-148.

[6] Adkins, M., et al. (2015). The Use of QR Codes in Physical Education Lessons as an Effort to Implement Differentiated Learning Models. Journal of Physical Education, Recreation & Dance.

[7] Blegur, J., & Hardiansyah, F. (2024). A Review of Publications on Differentiated Learning in Physical Education. Journal of Sport Sciences.

[8] Islahi, F., & Nasreen. (2013). Who Make Effective Teachers, Men or Women? Universal Journal of Educational Research, 1(4), 285-293.

[9] [9] Syafiulia, S. H., & Maadad, N. (2026). Teachers' narratives: Exploring the dynamics of inclusive education. International Journal of Educational Development, 120.

[10] Yuniawatika, Y., Bintartik, L., Surayanah, S., et al. (2025). Peningkatan Kompetensi Guru Abad 21 Melalui Pelatihan dan Pendampingan Penyusunan Perangkat Pembelajaran Berdiferensiasi. Jurnal Abdimas Bina Bangsa, 6(2), 1094-1106.

[11] Creswell, J. W., & Creswell, J. D. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. SAGE Publications.

[12] Keller, J. M. (2010). Motivational Design for Learning and Performance: The ARCS Model Approach. Springer.

[13] Prameswari, S. J., & Budiyanto, C. (2017). The Development of the Effective Learning Environment. Indonesian Journal of Informatics Education, 1(1), 79-86.

[14] Prabawanata, I K. A., Lesmana, K. Y. P., & Satyawan, I M. (2025). A Literature Analysis of Differentiated Instruction as a Learning Management Strategy in Physical Education. Journal of Physical Education and Health Sport (JPEHS), 12(2). https://doi.org/10.15294/jpehs.v12i2.39967

[15] Parman, A., Norito, T. B., Nugraha, U., Munar, H., & Oktadinata, A. (2026). Volleyball Underhand Passing Learning Model based on Teaching Games for Understanding (TGfU) for Elementary School Students. MIMBAR PGSD Undiksha, 14(1), 13-22. https://doi.org/10.23887/jjpgsd.v14i1.104115

[16] Hidayat, et al. (2025). Transformation of Physical Education Learning: Enhancing Students' Learning Motivation through a Differentiated Approach. Pendas: Jurnal Ilmiah Pendidikan Dasar.