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Implementation of Modified Sports Equipment as Learning Media for Baseball and Soccer in Elementary School

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Abstract:
Limited availability of sports facilities and equipment is a common challenge in elementary schools and often constrains the implementation of physical education learning. This community service program aimed to implement modified sports equipment as learning media for baseball and soccer at SD Negeri 1 Jaya Bakti. The activity involved 64 elementary school students and one physical education teacher as participants. The program was conducted through four stages: initial observation and identification of partner problems, preparation and development of modified sports equipment using simple and low-cost materials, training and simulation-based learning activities, and evaluation of implementation. The modified equipment was designed to be safer, lighter, and more suitable for students' physical characteristics. The results showed that the use of modified sports equipment increased students' participation, enthusiasm, and confidence during baseball and soccer learning activities. Most students demonstrated better engagement and skill execution when using the modified equipment compared to standard equipment. Teachers also reported greater flexibility in managing learning activities despite limited school facilities
Keywords: sports equipment modification; learning media; physical education; baseball; soccer

1. Introduction

Physical education plays a vital role in elementary school curricula by supporting students' physical development, motor skill acquisition, social interaction, and lifelong engagement in physical activity. Through structured learning experiences, physical education contributes not only to physical fitness but also to cognitive, emotional, and social development. Previous studies have highlighted that quality physical education programs are associated with positive educational and health outcomes among school-aged children (Bailey, 2006; World Health Organization, 2018). The effectiveness of physical education learning is strongly influenced by instructional design, teaching strategies, and the availability of appropriate learning resources. Teachers are required to create learning environments that are safe, engaging, and developmentally appropriate for students. Research in physical education pedagogy emphasizes that learning media and equipment play a central role in facilitating meaningful learning experiences and supporting student participation (Rink, 2014; Metzler, 2011).

In elementary physical education, sports-based activities such as baseball and soccer are commonly used to develop fundamental movement skills, coordination, teamwork, and basic game understanding. However, successful learning in these sports requires equipment that matches students' physical characteristics and skill levels. When equipment is too heavy, large,

or difficult to control, students may experience reduced confidence, lower participation, and limited learning progress (Ward et al., 2015; Rink, 2014). Despite the recognized importance of appropriate equipment, many elementary schools face challenges related to limited sports facilities and resources. Budget constraints, inadequate infrastructure, and unequal access to standard sports equipment remain common issues, particularly in public schools. Such limitations can restrict the implementation of effective physical education programs and reduce learning opportunities for students (Morgan & Hansen, 2008; World Health Organization, 2018).

These challenges were also observed at SD Negeri 1 Jaya Bakti. Preliminary observations and discussions with the physical education teacher indicated that the school had limited access to standard baseball and soccer equipment. As a result, learning activities often relied on substitute tools that were not fully suitable for elementary school students, making it difficult to conduct effective and safe learning simulations. One practical approach to addressing limitations in facilities and equipment is the modification of sports equipment. Equipment modification involves adjusting size, weight, material, and design to better suit students' developmental levels and learning needs. Previous research has demonstrated that equipment modification can reduce task difficulty, enhance skill acquisition, and increase student engagement in physical education settings (Ward et al., 2015; Metzler, 2011).

In addition to supporting student learning, modified sports equipment offers flexibility for teachers in managing instruction under resource-limited conditions. Adaptable learning media allow teachers to maintain instructional quality while ensuring safety and inclusivity. Such approaches are consistent with contemporary models of physical education that emphasize learner-centered instruction and contextual adaptation (Ennis, 2015; Casey & MacPhail, 2018).Therefore, this community service program aimed to implement modified sports equipment as learning media for baseball and soccer at SD Negeri 1 Jaya Bakti. The program was designed to provide practical, safe, and low-cost solutions for overcoming facility limitations, improving student participation and learning experiences, and supporting the effective implementation of physical education in elementary school contexts. This initiative aligns with broader efforts to promote accessible and sustainable physical education practices in schools.

2. Materials and Methods

This community service program was conducted at SD Negeri 1 Jaya Bakti and involved 64 elementary school students and one physical education teacher as participants. The program aimed to address limitations in sports facilities by implementing modified sports equipment as learning media for baseball and soccer. The method used in this community service activity was an educational and training-based approach, designed to provide practical solutions that could be directly applied in the school context.

The implementation of the program was carried out through four main stages: observation and problem identification, preparation of modified equipment, implementation of learning activities, and evaluation. These stages were designed to ensure that the activities were systematic, contextual, and aligned with the needs of the partner school.

The first stage was observation and problem identification. At this stage, the community service team conducted initial observations and informal interviews with the physical education teacher to identify existing problems related to sports facilities and learning implementation. The results of this stage indicated that the school lacked appropriate baseball and soccer equipment, causing students to practice using substitute tools that were not suitable for their physical characteristics.

The second stage was preparation and development of modified sports equipment. Based on the identified problems, the team prepared modified baseball and soccer equipment using simple, safe, and low-cost materials such as paper, raffia rope, rubber bands, and lightweight wood. The modified equipment was designed to be lighter, safer, and more appropriate for elementary school students, while still allowing the simulation of basic baseball and soccer skills.

The third stage was implementation through training and simulation-based learning activities. During this stage, students were introduced to the modified equipment and guided on how to use it correctly in baseball and soccer learning activities. The learning process emphasized active participation, basic skill practice, and safety. Teachers were also involved to ensure that the modified equipment could be integrated into regular physical education lessons.

The final stage was evaluation of the implementation. Evaluation was conducted through direct observation of student participation, engagement, and skill execution during learning activities, as well as feedback from the physical education teacher. The evaluation results were used to assess the effectiveness of the modified equipment as learning media and to identify potential improvements for future implementation.

3. Results

Implementation of Modified Sports Equipment

The community service activities were carried out according to the planned stages, beginning with the introduction of modified sports equipment to students and teachers at SD Negeri 1 Jaya Bakti. Students were first familiarized with the characteristics and functions of the modified equipment before participating in baseball and soccer simulation activities. The modified equipment was made from simple, lightweight, and safe materials, allowing students to use it comfortably during learning sessions.

Figure 1

Figure 2

Figure 3

Figure 1. Simulation of soccer learning using modified sports equipment
Figure 2. Simulation of baseball learning using modified sports equipment
Figure 3. Discussion and question-and-answer session during the activity

The use of modified equipment created a more engaging learning atmosphere. Students showed curiosity and enthusiasm when interacting with the learning media, which encouraged more active participation throughout the session.

Student Participation and Learning Performance

Observation results during the learning activities showed differences in student performance when using modified and standard equipment. A total of 34 students demonstrated better performance when using modified equipment, particularly in controlling the ball and executing basic movement skills. Meanwhile, 30 students performed better when using standard equipment, generally those who already had higher motor skill proficiency.

To clarify these results, student performance based on equipment type is presented in the following diagram.

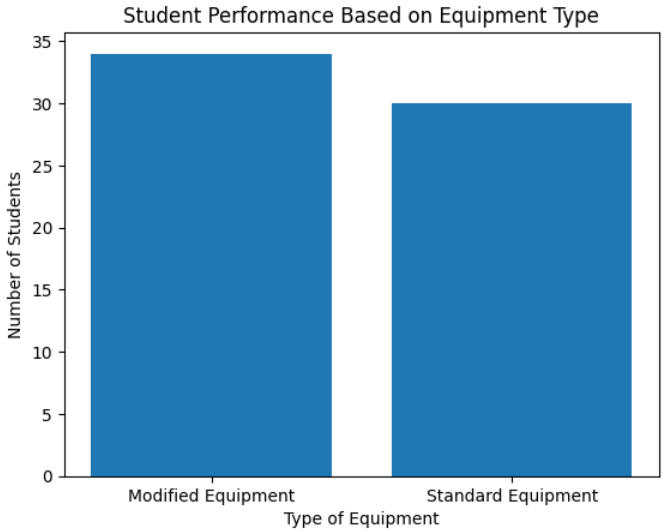

Figure 4. Student Performance Based on Equipment Type

This finding indicates that modified equipment is particularly effective during the introductory and practice phases, where students are still developing fundamental skills and confidence. Standard equipment remains relevant at later stages for students who are ready to transition to more realistic game conditions.

Teacher Response and Learning Management

From the teacher's perspective, the implementation of modified sports equipment provided greater flexibility in managing physical education learning. The modified equipment allowed learning activities to continue despite limited school facilities. Teachers reported that students were easier to organize during practice sessions and showed fewer safety-related issues compared to previous learning activities using standard equipment. The involvement of teachers during the activity also ensured that the modified equipment could be integrated into regular physical education lessons after the program ended, supporting the sustainability of the intervention.

Safety and Learning Environment

Safety was one of the most significant outcomes of this community service program. The use of soft and lightweight materials reduced the risk of injury during ball contact and movement activities. This safer learning environment increased students' confidence and willingness to participate actively, particularly among students who were previously hesitant to engage in baseball and soccer activities.

4. Discussion

The implementation of modified sports equipment in this community service program demonstrated a positive impact on student participation and engagement during baseball and soccer learning activities. Increased enthusiasm and active involvement indicate that learning media adapted to students' abilities can enhance motivation and learning comfort in physical education. This finding aligns with previous research emphasizing that appropriate learning environments and tools are fundamental to achieving meaningful learning outcomes in school-based physical education (Bailey, 2006; Morgan & Hansen, 2008). The observation that more

students performed better when using modified equipment highlights the importance of equipment suitability in elementary physical education. Modified equipment reduces task difficulty and allows students to focus on basic movement patterns rather than struggling with excessive physical demands. This result supports pedagogical perspectives suggesting that adapting equipment characteristics can facilitate skill acquisition and improve learning effectiveness among young learners (Rink, 2014; Ward et al., 2015).

The effectiveness of modified equipment was particularly evident during the introductory and practice phases of learning. At these stages, students are still developing fundamental motor skills and coordination. Motor learning and instructional theory emphasize that tasks should be simplified and progressively structured to match learners' developmental levels, enabling gradual mastery of skills (Metzler, 2011; Rink, 2014). From a teaching perspective, the use of modified sports equipment contributed to improved learning management. Teachers reported that learning activities were easier to organize, more controlled, and safer to implement. This finding is consistent with research suggesting that flexible instructional strategies and adaptable learning media support effective teaching practices, particularly in resource-limited school settings (Ennis, 2015; Casey & MacPhail, 2018). Safety emerged as a key benefit of the equipment modification approach. The use of lightweight and soft materials minimized the risk of injury and increased students' confidence to participate actively. Safety is a critical component of elementary physical education, as positive and secure learning experiences are essential for sustaining students' long-term engagement in physical activity (Bailey, 2006; World Health Organization, 2018). It is important to note that modified sports equipment does not replace standard equipment but functions as a transitional learning medium. Modified equipment supports the development of basic skills and confidence, while standard equipment remains relevant for advanced stages of learning. This progression reflects instructional models in physical education that emphasize gradual transitions from simplified to more complex learning conditions (Metzler, 2011; Hastie & Casey, 2014).

The implementation of modified equipment is particularly relevant for schools facing limitations in facilities and budgets. By utilizing simple and low-cost materials, teachers can maintain instructional quality without relying solely on standard equipment. Such approaches align with sustainable and inclusive physical education practices that prioritize accessibility and equity in school learning environments (Morgan & Hansen, 2008; World Health Organization, 2018). Overall, the discussion confirms that modified sports equipment serves as an effective and practical solution for improving physical education learning in elementary schools. By enhancing participation, safety, and skill development, equipment modification supports the broader goals of physical education and contributes to positive learning experiences. These findings reinforce the importance of innovation and adaptability in physical education practice, particularly within community service and school-based intervention contexts (Bailey, 2006; Ward et al., 2015).

Research Limitations

This community service program has several limitations that should be considered when interpreting the findings. First, the implementation was conducted in a single elementary school, SD Negeri 1 Jaya Bakti, with a limited number of participants. Therefore, the results may not fully represent conditions in other schools with different characteristics, facilities, or student backgrounds.

Second, the evaluation of program outcomes was primarily based on descriptive observations of student participation, performance, and teacher feedback. Quantitative measurements of skill improvement, such as standardized motor skill tests or validated performance assessment instruments, were not applied in this program due to its community service orientation and time constraints.

Third, the duration of the implementation was relatively short and focused on introductory and practice phases of baseball and soccer learning. As a result, the long-term effects of using modified sports equipment on students' skill development, learning retention, and physical fitness could not be comprehensively examined.

Directions for Future Research

Future research is recommended to expand the scope of this study by involving multiple schools and larger participant groups to enhance the generalizability of findings. Comparative studies between schools with different facility conditions may provide deeper insights into the effectiveness of modified sports equipment in diverse educational contexts.

In addition, future studies could incorporate experimental or quasi-experimental designs to quantitatively measure the impact of modified sports equipment on specific learning outcomes, such as motor skill development, coordination, and physical fitness levels. The use of standardized assessment instruments would strengthen empirical evidence related to the effectiveness of equipment modification.

Further research is also encouraged to explore the long-term implementation of modified sports equipment within regular physical education curricula. Investigating teacher readiness, sustainability of equipment use, and integration with progressive learning stages may contribute to the development of practical guidelines for physical education teachers in resource-limited schools.

5. Conclusions

This community service program demonstrated that the implementation of modified sports equipment can serve as an effective learning medium for baseball and soccer in elementary school physical education. The use of simple, safe, and low-cost modified equipment successfully addressed limitations in facilities at SD Negeri 1 Jaya Bakti and enabled learning activities to be conducted more effectively.

The results showed that modified sports equipment increased students' participation, confidence, and engagement during learning activities, particularly during introductory and practice phases. The equipment was more suitable for students' physical characteristics and contributed to a safer learning environment. From the teachers' perspective, the modified equipment provided greater flexibility in managing learning activities despite limited infrastructure.

Overall, the implementation of modified sports equipment offers a practical and sustainable solution for improving the quality of physical education learning in elementary schools with limited resources. This approach can be adapted and replicated in similar school contexts to support active participation, skill development, and positive learning experiences.

Conflict of Interest

The authors declare no conflict of interest.

6. References

Bailey, R. (2006). Physical education and sport in schools: A review of benefits and outcomes. Journal of School Health, 76(8), 397–401. https://doi.org/10.1111/j.1746-1561.2006.00132.x

Casey, A., & MacPhail, A. (2018). Adopting a models-based approach to teaching physical education. Physical Education and Sport Pedagogy, 23(3), 294–310. https://doi.org/10.1080/17408989.2018.1429588

Ennis, C. D. (2015). Knowledge, transfer, and innovation in physical education teacher education. Sport, Education and Society, 20(5), 588–606. https://doi.org/10.1080/13573322.2014.964162

Hastie, P. A., & Casey, A. (2014). Fidelity in models-based practice research in sport pedagogy. Journal of Teaching in Physical Education, 33(3), 422–431. https://doi.org/10.1123/jtpe.2013-0141

Kirk, D. (2010). Physical education futures. London: Routledge.

Metzler, M. W. (2011). Instructional models for physical education (3rd ed.). Scottsdale, AZ: Holcomb Hathaway.

Morgan, P. J., & Hansen, V. (2008). Physical education in primary schools: Classroom teachers' perceptions of benefits and outcomes. Health Education Journal, 67(3), 196–207. https://doi.org/10.1177/0017896908094637

Rink, J. E. (2014). Teaching physical education for learning (7th ed.). New York, NY: McGraw-Hill.

Ward, P., Kim, I., Ko, B., & Li, W. (2015). Effects of equipment modification on student skill acquisition in physical education. Journal of Teaching in Physical Education, 34(2), 261–279. https://doi.org/10.1123/jtpe.2013-0184

World Health Organization. (2018). Global action plan on physical activity 2018–2030. Geneva: WHO.