



Adaptive Management of Sports Facilities Under Budget Constraints to Boost Student Achievement

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ABSTRACT

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This study aims to examine how sports facilities and infrastructure are managed under budget constraints to support student achievement. The research employs a qualitative descriptive approach, focusing on the strategic management of planning, procurement, utilization, and maintenance processes. Data were collected through in-depth interviews with facility managers and analysis of official student competition records. The findings indicate that management practices emphasize priority-based planning, adaptive maintenance strategies, and optimization of existing facilities rather than expansion. Procurement is conducted through formal e-procurement procedures, while utilization is facilitated by a digital booking system that enhances accessibility. Maintenance is performed selectively due to limited budgets, often requiring a single vendor to manage multiple locations. These results suggest that effective management under fiscal constraints relies on strategic prioritization and resource optimization to sustain student performance. Although budget limitations restrict expansion and comprehensive maintenance, adaptive strategies enable facilities to continue supporting student athletic development.

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INTRODUCTION

Student sports achievement represents a critical component of non-academic educational outcomes and significantly contributes to the overall quality of education (Thompson et al., 2022). Beyond cognitive development, sports participation fosters physical health, teamwork, discipline, and resilience, which are essential for holistic student development (Aliyev et al., 2025; Javornik & Mirazchiyski, 2023). Effective performance in sports is influenced not only by natural talent or coaching quality but also by the availability, accessibility, and systematic management of sports facilities and infrastructure (Kang et al., 2024).

In management theory, these facilities must be guided by the fundamental functions of planning, organizing, actuating, and controlling, as proposed by George R. Terry (Terry, 2021), to ensure that infrastructure supports measurable performance outcomes. In the public sector, efficient facility management aligns with principles of New Public Management, emphasizing accountability, efficiency, and performance orientation. Evidence from previous studies shows that well-managed sports facilities are strongly correlated with enhanced student athletic performance and broader educational benefits (Gunawan et al., 2021). Therefore, the societal importance of effective sports infrastructure management is clear: it enables institutions to develop capable, healthy, and competitive students, reinforcing education quality and community engagement (Sun et al., 2024).

Despite the recognized importance of sports facilities in promoting student achievement, many educational institutions and public agencies face persistent challenges in infrastructure management (Kubitskyi et al., 2022; Thompson et al., 2024). Budget constraints, limited land availability, and competing priorities often restrict the scope and quality of facility development and maintenance (Saputri & Fatmawati, 2024). Public institutions must allocate resources across multiple sectors, including academic programs, administrative functions, and community services, which can reduce the available funding for sports infrastructure (Valiyev et al., 2025). Consequently, facilities may suffer from deferred maintenance, inadequate equipment, and underutilization, all of which negatively affect student training programs and competitive readiness (Ananda et al., 2023). These limitations create a systemic problem in which institutions are unable to fully capitalize on the potential benefits of sports programs for students, resulting in performance gaps and reduced opportunities for skill development. Addressing these challenges requires not only additional resources but also strategic management practices capable of optimizing available infrastructure to sustain student achievement under fiscal pressures (Radebe et al., 2025).

In practice, managing sports facilities under fiscal constraints presents a complex operational challenge for public institutions. Multi-use facilities must accommodate diverse stakeholders, including school programs, community groups, and public events, often within limited schedules and physical capacity (Anshori et al., 2022). In such conditions, prioritization becomes critical; facilities that directly support student competitions and training must be scheduled and maintained before less critical activities. For instance, in several municipal sports divisions, limited budgets necessitate phased maintenance and selective procurement, with one vendor often responsible for multiple sites, which can delay or limit repair processes. Simultaneously, digital solutions, such as online

booking systems, have been implemented to improve accessibility and reduce scheduling conflicts. However, these adaptive strategies still face constraints that require careful planning, resource allocation, and monitoring to ensure that infrastructure continues to support student athletic performance without compromising quality or equity in access (Novianti et al., 2024).

Previous research consistently highlights the critical role of financial resources in the management of educational and sports infrastructure. Budget availability influences maintenance routines, facility renewal, and infrastructure expansion, all of which directly affect service quality and student performance outcomes (Saputri & Fatmawati, 2024; Ananda et al., 2023). Studies in sports education further demonstrate that reliance on specific funding sources often encourages institutions to form partnerships or collaborative arrangements to sustain facility operations. Furthermore, the strategic alignment of infrastructure management with performance objectives has been shown to mitigate some negative effects of limited funding. For example, structured and priority-driven management approaches in schools and provincial sports programs enable continued athlete development and competitive readiness despite budgetary restrictions (Gunawan et al., 2021; Aliyya Burhanudin et al., 2024). These findings underscore the importance of managerial quality and strategic planning as key mediators between resource scarcity and performance outcomes, rather than financial inputs alone.

Despite these insights, significant research gaps remain. Most studies focus either on school-based infrastructure or provincial-level competitions, leaving limited understanding of how municipal public agencies manage multi-stakeholder sports facilities under fiscal constraints. Specifically, little attention has been given to how local government divisions strategically prioritize planning, procurement, utilization, and maintenance to support student achievement at the city level (Shalihin et al., 2021). Moreover, while the Resource-Based View (Elya Dasuki, 2021) and managerial function frameworks (Terry, 2021) provide theoretical guidance, empirical studies integrating these perspectives with public sector governance and budget limitation realities remain scarce. Addressing these gaps is essential to develop evidence-based strategies that optimize facility performance, enhance student outcomes, and inform policy and practice for municipal sports infrastructure management. This also allows exploration of adaptive and strategic mechanisms that transform budget limitations into opportunities for innovative governance (Andrade et al., 2024; Silva et al., 2022).

This study contributes originality by combining management theory, public sector governance frameworks, and Resource-Based View perspectives to analyze sports infrastructure management under fiscal constraints. Unlike prior research focused primarily on single institutions or higher-level regional

programs, this study examines municipal-level management where multi-stakeholder utilization, budget restrictions, and public accountability intersect. It investigates not only the structural and operational challenges but also the strategic mechanisms adopted to sustain student athletic achievement. By integrating qualitative data from facility managers and official performance records, the research offers both theoretical and practical insights. The novelty lies in demonstrating how adaptive, priority-driven, and efficiency-oriented management practices enable student performance to be maintained despite financial and capacity limitations. Such findings extend the current literature on public sports infrastructure management by showing the potential for strategic governance to mediate resource scarcity and institutional performance, thereby informing policy and administrative strategies in comparable public sector contexts.

Accordingly, this study addresses the question: How can municipal sports facilities be managed under budget constraints to effectively support student athletic achievement? It argues that while financial and capacity limitations present structural challenges, strategic prioritization, adaptive planning, selective procurement, optimized utilization, and preventive maintenance can sustain institutional performance. This approach positions managerial quality as the critical intervening variable between budget constraints and student outcomes. By conducting a case study at a municipal sports division and analyzing both management practices and student competition results, the research contributes empirically grounded insights into effective governance under fiscal pressure. The study therefore advances understanding of public sector sports infrastructure management and offers practical guidance for optimizing limited resources while maintaining student achievement, bridging theoretical frameworks with real-world municipal challenges.

RESEARCH METHODS

This study employed a qualitative case study design with an evaluative orientation to analyze the management of sports facilities and infrastructure in supporting student athletic achievement. The case study approach was selected to enable an in-depth understanding of real-world practices within a municipal public institution, particularly under conditions of budget constraints. By focusing on the managerial stages of planning, procurement, utilization, maintenance, and development, the study aimed to examine how sports facilities are systematically managed to optimize performance outcomes, consistent with theoretical frameworks such as George R. Terry's managerial functions (Terry, 2021) and Resource-Based View. This design allows for the exploration of complex governance dynamics that cannot be captured through quantitative methods alone.

The research was conducted at the Youth and Sports Division (PORA) of the municipal Department of Education, Youth, and Sports, selected due to its central role in managing city-level sports infrastructure and supporting student

competitions. Purposive sampling was applied to select participants directly involved in facility management, ensuring that informants possessed sufficient professional experience to provide comprehensive insights into operational workflows, government procurement procedures, budget allocation limitations, coordination with schools, and strategic decision-making. Primary data were collected through semi-structured interviews, focusing on planning, procurement, utilization patterns, maintenance systems, and service innovations. Secondary data included official documents, such as the PORISWA Champion Decrees for 2024 and 2025, to contextualize student sports achievement and validate interview findings (Shalihin et al., 2021).

Data analysis followed an interactive model, consisting of data reduction, data display, and conclusion drawing. Interview transcripts were thematically coded based on the stages of infrastructure management and emergent patterns, including fiscal constraints and strategic prioritization. Triangulation was applied to ensure data validity, combining source triangulation from multiple informants and document verification (Aliyya Burhanudin et al., 2024; Gunawan et al., 2021). Ethical considerations were observed by maintaining participant confidentiality and protecting sensitive institutional information, consistent with social research ethics standards. This methodology enabled a rigorous, contextually grounded understanding of municipal sports infrastructure management under budget limitations.

RESULTS AND DISCUSSION

Budget Constraints as a Structural Reality in Sports Infrastructure Management

The findings indicate that sports facilities and infrastructure management within PORA operates under recurring structural budget constraints. The allocated annual budget is insufficient to fully accommodate all maintenance, rehabilitation, and development needs, requiring some programs to be postponed, reduced in scope, or implemented in phases. These constraints reflect structural fiscal conditions inherent in local government budgeting, as sports infrastructure competes with other public services for funding (Valiyev et al., 2025).

From the New Public Management perspective, fiscal limitations intensify the need for efficiency, rational allocation, and accountability in public spending (Indrawati, 2010). Meanwhile, the Resource-Based View emphasizes that scarcity challenges organizations to optimize the strategic value of existing resources rather than weakening performance (Elya Dasuki, 2021). Findings suggest that PORA interprets budget constraints as conditions shaping selective and adaptive management strategies, rather than absolute barriers. Prior studies often link

limited funding to deferred maintenance and declining facility quality (Sulz et al., 2022), yet this research shows adaptive adjustments can sustain functional support for student athletic performance.

Planning under Budget Constraints: Strategic Prioritization and Alignment

Budget limitations heavily influence infrastructure planning, which is conducted through strict prioritization mechanisms. Facilities directly supporting student training and competitions receive higher priority than broader expansion initiatives. This aligns with Terry's managerial functions, where planning establishes organizational direction and resource allocation strategies. Under fiscal pressure, planning becomes realistic and impact-oriented, emphasizing urgency and measurable contributions to student outcomes.

Phased planning further allows large-scale upgrades to be implemented over multiple fiscal periods, maintaining continuity while adhering to budget constraints. From a Resource-Based View perspective, prioritization maximizes the strategic value of existing facilities. Aligning planning with performance targets reflects New Public Management principles, ensuring expenditures correspond to tangible outputs. Overall, strategic planning transforms fiscal limitations into resource optimization rather than mere reduction.

Procurement Adjustment under Limited Budget: Selective and Rational Allocation

Procurement strategies under budget constraints prioritize urgent repairs and replacement of unusable equipment, while new acquisitions are selective and aligned with fiscal capacity (Sakdiyah et al., 2026). Each procurement decision is evaluated based on relevance to student training and competition preparation, demonstrating rationalized expenditure. Terry's managerial functions are reflected in this organized and deliberate procurement process (Terry, 2021).

In the New Public Management framework, procurement ensures value for money while maintaining minimum quality standards. From a Resource-Based View perspective, selective procurement preserves the strategic integrity of critical assets. Despite reduced acquisition volumes, functional capacity is safeguarded, illustrating that strategic focus can compensate for limited financial expansion.

Utilization Management and Limited Facility Capacity

Facility capacity limitations present additional managerial challenges, as multiple users require structured scheduling and coordination. Student training and competitions are prioritized, ensuring alignment with institutional

performance objectives. Terry's functions of actuating and controlling are evident in monitoring facility use and enforcing scheduling policies.

Effective utilization maximizes output from limited resources, demonstrating that competitive performance depends not solely on facility quantity but on managerial capability. This approach mitigates negative effects of capacity constraints, sustaining student athletic performance (Khadavi & Maulana, 2020).

Maintenance Strategy under Fiscal Pressure: Preventive and Sustainable Approach

Maintenance is most directly affected by budget constraints, leading to prioritization based on facility usage and urgency. Preventive maintenance minimizes severe future damage and reduces costs, shifting management from reactive to proactive (Terry, 2021).

Resource-Based View emphasizes maintaining infrastructure quality as a strategic asset, supporting long-term competitive performance (Elya Dasuki, 2021). Budget limitations, therefore, foster a preventive and efficiency-driven maintenance model rather than weakening facility functionality.

Implications for Student Achievement under Budget Constraints

Despite budget and capacity limitations, student athletic achievement has remained stable, supported by official PORISWA records for 2024 and 2025 (Shalihin et al., 2021). Financial constraints do not directly determine performance; effective prioritization, efficiency mechanisms, and monitoring play a decisive role.

From a Resource-Based View, student achievement results from strategic optimization of limited resources. Well-maintained and prioritized facilities act as strategic assets supporting athlete development (Elya Dasuki, 2021). The integrated application of Terry's managerial functions demonstrates that adaptive management mitigates structural limitations, showing that fiscal constraints can encourage selective, efficient, and performance-oriented practices (Wang et al., 2024). Effective governance, therefore, outweighs mere budget increases in sustaining student performance (Kassaw & Demareva, 2023; Kovács et al., 2024).

CONCLUSION

This study demonstrates that effective management of sports facilities and infrastructure under budget constraints relies on adaptive and strategic governance, where fiscal limitations and facility capacity do not inherently impede institutional performance but instead foster selective, prioritized, and

efficiency-oriented practices. Key findings highlight that systematic adjustments across planning, procurement, utilization, and maintenance enable limited resources to support sustained student athletic development, reinforcing the practical relevance of George R. Terry's managerial functions, the Resource-Based View, and New Public Management principles in public sector performance. The study contributes to the scholarly discourse by showing that strategic resource optimization and managerial quality can mediate the impact of financial limitations, offering empirical evidence that governance effectiveness can outweigh nominal budget size in achieving outcomes. However, the research is limited by its single-case design and reliance on qualitative data from one municipal context, which may constrain generalizability. Future studies could expand this analysis through comparative multi-municipality investigations or by integrating quantitative budget-performance correlations to further validate the mechanisms linking infrastructure management and student achievement.

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