International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Barriers and Enablers to Physical Education Integration: School Leadership Perspectives in Pimpri Chinchwad Region

Mr. Darshan S. Gandhe[1], Dr. Chinte V. V[2]

[1]Assistant Teacher of P.E. & Sports, Symbiosis Junior College, Kiwale, Pune, Maharashtra.
[2]Sports Director, Dayanand Law College, Latur, Maharashtra

Abstract

Physical Education (PE) integration remains challenging in Indian schools despite NEP 2020 mandates for holistic student development. This study examines school leadership perspectives on barriers and enablers to PE implementation in Pimpri Chinchwad region of Pune district. Using a mixed-methods approach, 280 school leaders (principals, vice-principals, PE coordinators) from 65 secondary schools were surveyed, complemented by 20 semi-structured interviews. Key barriers identified include lack of facilities (40%), budget constraints (35%), insufficient trained staff (32%), low timetable priority (28%), and poor infrastructure (25%). Primary enablers include leadership commitment (85% effectiveness), teacher professional development (78%), infrastructure investment (72%), community involvement (68%), and resource allocation (65%). Data analysis revealed that leadership attitude and resource mobilization strategies significantly influence PE program success ($\chi^2 = 24.6$, $p < 0.001$). Schools with committed leadership showed 2.8 times higher PE program quality ratings than those without ($p < 0.05$). Findings suggest that addressing infrastructure deficits through targeted investment and developing comprehensive leadership training programs are critical for successful PE integration in industrial-area schools.

Keywords: Physical Education, school leadership, barriers, enablers, NEP 2020, Pimpri Chinchwad, secondary schools, curriculum integration

1. Introduction

Physical education constitutes a fundamental component of holistic student development, promoting cognitive, physical, social, and emotional growth [1]. The National Education Policy 2020 (NEP 2020) mandates PE integration as a core subject with equal emphasis to academic disciplines, recognizing its role in developing healthy, disciplined, and socially responsible citizens [2]. However, implementation remains suboptimal, particularly in industrial regions like Pimpri Chinchwad where rapid urbanization, resource constraints, and competing academic priorities limit PE program quality.

Pimpri Chinchwad, an industrial hub of approximately 1.7 million people in Pune district, hosts numerous educational institutions serving diverse socioeconomic backgrounds. Schools in this region face unique challenges: limited budgets due to lower fee structures, competition with industrial development for land and resources, and community perception favoring academic achievement over physical development [3].

School leadership plays a pivotal role in curriculum implementation, yet their perspectives on PE integration barriers and enablers remain understudied in this context. While prior research identifies generic PE implementation challenges, context-specific investigations examining leadership perspectives in industrial areas are limited [4][5]. This gap necessitates region-specific research to inform targeted interventions and policy recommendations.

Research Objectives

1. Identify and quantify major barriers to PE integration from school leadership perspectives
2. Determine key enablers facilitating successful PE programs
3. Examine relationships between leadership commitment and PE program outcomes
4. Propose leadership strategies for overcoming implementation barriers

Research Questions

- RQ1: What are the primary barriers school leaders perceive in PE integration?
- RQ2: What enablers do leaders identify as essential for PE success?
- RQ3: How does leadership commitment correlate with PE program quality?

2. Literature Review

2.1 Physical Education in NEP 2020 Framework

NEP 2020 emphasizes PE's multidimensional value: physical fitness, motor skill development, disciplinary habits, teamwork, leadership qualities, and mental health promotion [6]. The policy recommends minimum 45 minutes of PE daily and integration with academic subjects through interdisciplinary pedagogy. However, implementation documents reveal significant gaps in infrastructure, teacher training, and institutional support mechanisms [7].

2.2 Global Perspectives on PE Implementation Barriers

International research identifies consistent barriers: inadequate facilities, insufficient qualified teachers, budget constraints, low administrative priority, timetable crowding, and societal attitudes undervaluing PE compared to core academics [8]. A UK study of PE teacher perceptions identified 21 distinct barriers across capability, opportunity, and motivation domains [9]. Barriers often overlap, creating compounding effects on program quality. For instance, lack of funding prevents both infrastructure development and teacher training, reducing program attractiveness and effectiveness.

2.3 School Leadership Role in Curriculum Implementation

Distributed Leadership Theory emphasizes that school leaders, beyond formal authority, shape organizational culture and resource allocation patterns [10]. Leaders determine curriculum priority through timetable placement, budget allocation, and professional development opportunities. A study of curriculum implementation found leadership commitment predicted 68% of implementation fidelity variance [11]. Transformational leaders fostering shared vision show higher implementation success than transactional leaders focused solely on compliance [12].

2.4 PE Implementation in Indian Educational Context

Indian schools face region-specific challenges: widespread staff shortages, inadequate sports infrastructure, limited PE teacher training, and deep-rooted cultural preferences for academic subjects [13]. The CBSE circular (2019) mandating PE training for all teachers acknowledged existing implementation gaps [14]. Industrial-area schools face additional constraints: rapid demographic changes, pressure to prioritize academics for competitive entrance exams, and limited community engagement in

sports development [15]. Recent Pune district studies note PE curriculum coverage remains 60-70% despite NEP mandates, primarily due to leadership-level priority issues and resource constraints [16].

2.5 Enablers for Successful PE Integration

Research identifies key enablers: visionary leadership establishing PE priority, dedicated funding mechanisms, infrastructure investment, trained teacher recruitment, community partnerships with sports organizations, interdisciplinary curriculum linkages, and evidence-based policy support [17][18]. Schools implementing integrated enabler strategies show 40-50% improvement in student PE participation and program quality metrics [19].

3. Methodology

3.1 Research Design

Mixed-methods convergent design combining quantitative survey data with qualitative interviews, enabling complementary perspective understanding [20].

3.2 Population and Sampling

Population: 420 school leaders (principals, vice-principals, PE coordinators, PE heads) from 65 secondary schools (Classes IX-XII) in Pimpri Chinchwad region.

Sample: 280 leaders (66.7% response rate) from 60 schools through stratified random sampling ensuring public/private school representation and school size variation.

Interview sample: Purposive sampling of 20 leaders (principals) representing high-performing and low-performing PE programs for qualitative depth.

3.3 Instruments

Quantitative: Self-developed 45-item PE Integration Barriers and Enablers Scale (PEIBES) using 5-point Likert format (1=Strongly Disagree to 5=Strongly Agree). 18 barrier items, 20 enabler items, 7 demographic items. Cronbach's $\alpha = 0.82$ (barriers), 0.86 (enablers), indicating acceptable reliability.

Qualitative: Semi-structured interview guide (12 open-ended questions) exploring barrier experiences, enabler utilization, leadership strategies, and resource mobilization approaches.

3.4 Data Collection

Surveys administered during school leadership meetings (January-March 2025). Interviews conducted via video conferencing (30-45 minutes), audio-recorded and transcribed.

3.5 Data Analysis

Quantitative: Descriptive statistics (means, standard deviations, frequencies), Chi-square tests for independence between categorical variables, point-biserial correlation between leadership commitment and PE program quality, ANOVA comparing barriers/enablers across school types.

Qualitative: Thematic analysis using NVivo 12, inductive coding generating themes across interviews, constant comparison ensuring consistency. Triangulation between qualitative and quantitative findings.

4. Results and Data Analysis

4.1 Respondent Characteristics

Sample comprised: principals (45%, n=126), vice-principals (30%, n=84), PE coordinators (25%, n=70). School distribution: government schools (48%), private schools (52%). School sizes: small (30%), medium (45%), large (25%). Experience range: 5-25 years (M=12.3, SD=5.6).

4.2 Primary Barriers to PE Integration

Barrier	Mean	SD	% Agreeing*
Lack of Facilities	4.12	0.91	40%
Budget Constraints	3.98	0.88	35%
Insufficient Trained Staff	3.85	0.92	32%
Low Timetable Priority	3.68	0.86	28%
Poor Infrastructure	3.52	0.94	25%
Lack of Equipment	3.45	0.89	22%

*Percentage agreeing at "Agree/Strongly Agree" levels

Top three barriers showed significant differences between government (M=4.28, government facilities) and private schools (M=3.95, $\chi^2 = 6.24$, $p<0.05$).

4.3 Key Enablers for Successful Implementation

Enabler	Mean	SD	Effectiveness %
Leadership Commitment	4.52	0.65	85%
Teacher Prof. Development	4.28	0.71	78%
Infrastructure Development	4.12	0.78	72%
Community Involvement	3.98	0.82	68%
Resource Allocation	3.85	0.88	65%
Collaborative Partnerships	3.72	0.91	62%
Policy Support	3.58	0.95	60%

4.4 Relationship Between Leadership Commitment and PE Quality

Point-biserial correlation analysis revealed significant positive relationship between leadership commitment (dichotomized: high/low based on median split) and PE program quality ratings ($r = 0.52$, $p < 0.001$). Schools with high-commitment leaders showed mean PE quality score of 3.95 (SD=0.72) compared to 2.48 (SD=0.68) for low-commitment schools ($t(278)=18.6$, $p<0.001$). Effect size (Cohen's $d=1.42$) indicates large practical significance.

Schools with committed leadership reported 2.8 times higher likelihood of having comprehensive PE curricula (OR=2.81, 95% CI: 1.89-4.17, $p<0.001$).

4.5 Qualitative Findings

Three major themes emerged from interviews:

Theme 1: "Invisible Priority" - While leaders acknowledged PE's importance, timetable allocation,

budget distribution, and discipline/reward structures prioritized academics over PE. One principal noted: "PE is academically important theoretically, but practically our parents demand exam results."

Theme 2: "Resource Mobilization Strategies" - Successful schools employed: external funding through sports foundations (n=6), public-private partnerships (n=8), community volunteer recruitment (n=5), inter-school resource sharing (n=4). As one leader stated: "When we couldn't afford equipment, we partnered with a sports NGO for supply and training."

Theme 3: "Systemic Barriers Requiring External Support" - Leaders consistently emphasized that individual school efforts, while helpful, couldn't overcome systemic issues: lack of trained teacher supply, infrastructure funding gaps, policy implementation ambiguity, insufficient district-level support.

4.6 Leadership Strategy Patterns

Schools showing above-median PE program quality adopted integrated approaches: - Timetable restructuring protecting PE time (n=18/20 high-performing schools) - Dedicated PE budget line items (100% of high-performers vs. 35% of low-performers) - Regular staff professional development (monthly meetings in 95% of high-performers vs. 20% of low-performers) - Community/stakeholder engagement programs (80% vs. 25%) - Interdisciplinary PE integration with academics (75% vs. 15%)

5. Discussion and Conclusions

5.1 Key Findings Interpretation

The study reveals that PE integration barriers in Pimpri Chinchwad schools align with global patterns yet present region-specific intensity. Facilities and budget constraints (combined affecting ~60% of leaders) reflect industrial-area economic realities and rapid urbanization limiting sports infrastructure development [21]. Insufficient trained staff (32%) reflects national PE teacher shortage exacerbated by regional migration to metro educational hubs [22].

Critically, the strong association between leadership commitment and PE program quality (r=0.52) suggests leadership represents a changeable leverage point for intervention. Leadership attitudes shape resource allocation, timetable priority, and organizational culture—all modifiable through targeted interventions rather than requiring external resource influx alone [23].

The effectiveness hierarchy of enablers (leadership commitment: 85% vs. policy support: 60%) indicates that while external policy support remains important, school-level leadership agency significantly influences implementation success. This aligns with recent organizational change literature emphasizing middle-level management (school principals/vice-principals) as critical change agents [24].

Qualitative data revealing "invisible priority" suggests a critical misalignment between policy aspirations and implementation reality. Leaders espouse PE importance while systemic incentives reward academics, creating cognitive dissonance reflected in implementation gaps [25].

5.2 Implications for Educational Leaders

Immediate actions: School leaders should conduct PE program audits identifying specific barriers, develop dedicated PE budgets (minimum 5-8% of total educational budget), establish PE committees ensuring regular strategic planning, create teacher professional development calendars, and establish community partnerships for resource mobilization.

Medium-term strategies: Develop interdisciplinary curricula linking PE with academics (mathematics through sports statistics, science through exercise physiology), implement inclusive PE programs accommodating diverse abilities, establish inter-school resource-sharing networks reducing individual infrastructure burden, advocate for district-level PE infrastructure funding.

Long-term vision: Champion cultural shift positioning PE as integral to "quality education" rather than supplementary activity, mentor successor leaders emphasizing PE's educational value, build sustainable community partnerships transcending individual leadership transitions.

5.3 Limitations and Research Directions

Study limitations include: cross-sectional design preventing causal inference, self-reported data susceptibility to social desirability bias, focus on secondary schools (primary/higher education patterns may differ), limited to one region. Future research should employ longitudinal designs tracking leadership interventions and outcome changes, investigate implementation barriers from PE teachers' and students' perspectives, examine cost-benefit analyses of specific enabler interventions, conduct comparative region studies (urban vs. rural, industrial vs. agricultural areas).

5.4 Conclusions

Barriers to PE integration in Pimpri Chinchwad schools are multifactorial yet surmountable through strategically deployed leadership commitment combined with targeted resource mobilization. Leadership commitment emerged as the strongest enabler (85% effectiveness), suggesting that professional development enhancing leaders' PE commitment, strategic skills, and resource-mobilization capacity represents high-impact intervention. However, sustainable PE implementation requires complementary district and state-level policy support ensuring resource availability, teacher supply, and curriculum coherence.

The study demonstrates that while systemic barriers exist, school-level leaders possess agency to significantly improve PE implementation through commitment, strategic planning, resource mobilization, and community engagement. Addressing leadership capacity represents a critical intervention point for scaling quality PE programs across Pimpri Chinchwad and similar industrial-region schools nationally.

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