

## **Role of Physical Education in Holistic Development under the National Education Policy 2020**

Dr. Nagendra Pal  
Associate Professor in Physical Education  
Government Girls Degree College, Rampur (UP)

### **ABSTRACT**

Physical Education (PE) has long occupied a peripheral position in Indian school curricula, treated largely as a recreational interlude rather than a pedagogical necessity. The National Education Policy 2020 (NEP 2020) disrupts this tradition by explicitly mandating the integration of PE, yoga, sports, and health-related activities across all grade levels. This paper examines the extent to which this policy shift translates into measurable improvements in the holistic development of school-going children. Drawing on a mixed-methods study conducted across 48 schools in four states Pradesh, Maharashtra, Kerala, and Rajasthan between January 2022 and December 2023, the research found that structured PE integration under NEP 2020 guidelines produced statistically significant gains in physical fitness, psychosocial adjustment, academic concentration, and emotional regulation. Qualitative findings from teacher interviews and student focus groups added texture to the quantitative data, pointing to deeper shifts in school culture, peer relationships, and self-discipline. The paper argues that the policy framework is directionally sound but suffers from implementation inconsistencies rooted in inadequate teacher training, infrastructure deficits, and the continued dominance of examination-oriented pedagogy. Recommendations for policymakers, school administrators, and curriculum designers are offered in the conclusion.

### **KEYWORDS**

Physical Education, NEP 2020, Holistic Development, School Curriculum, Student Well-Being, Health Literacy, Educational Policy India

### **1. INTRODUCTION**

There is something quietly troubling about a school system that can produce students who can solve differential equations but cannot run a sustained kilometre or manage the ordinary stress of a competitive examination. Indian schooling, for much of its post-Independence history, has defaulted to a narrow conception of education – one measured primarily by marks, managed through rote, and delivered through a pedagogy of passive reception. Physical Education sat at the margins of this arrangement, timetabled as a concession to childhood rather than recognised as a developmental necessity.

The National Education Policy 2020 makes a different argument. In its language and its structure, it insists that the body and the mind are not separate projects, that learning is embodied as much as it is cognitive, and that a genuinely educated person is one who is physically literate, emotionally regulated, socially competent, and intellectually curious. NEP 2020 calls for PE and yoga to be part of the core curriculum from Grades 1 through 12, and it frames sport and physical activity not as extracurricular embellishments but as integral to the formation of the whole person (Ministry of Education, 2020).

This paper takes that claim seriously and asks whether the policy, in its current implementation phase, is actually delivering on it. The question is not merely academic. More than 250 million children attend government and government-aided schools in India (UDISE+, 2023). If PE integration under NEP 2020 produces even modest gains in their physical health, emotional resilience, and capacity for collaborative work, the aggregate developmental dividend would be enormous. If it does not, if the policy mandate remains a textual aspiration undone by structural realities then the gap between intention and outcome needs to be understood and addressed.

### ***1.1 Research Objectives***

This study was guided by the following objectives:

- (a) To assess the impact of NEP 2020 aligned PE integration on the physical fitness and health outcomes of school students.
- (b) To examine the relationship between structured PE participation and psychosocial development, including emotional regulation, peer relations, and self-discipline.
- (c) To identify the implementation gaps that limit the effectiveness of PE programmes in schools attempting to align with NEP 2020.
- (d) To offer evidence-based recommendations for educators, curriculum designers, and policymakers.

## **2. LITERATURE REVIEW**

### ***2.1 Physical Education in the Indian Policy Context***

Physical Education in Indian schools has been chronically underfunded and structurally marginalised. Earlier policies from the Kothari Commission (1964–66) to the National Curriculum Framework 2005 acknowledged its importance in the abstract while failing to mandate it with the specificity needed to alter ground-level practice. Teachers of PE were routinely assigned non-PE duties, playgrounds were conceded to construction, and examination boards assigned no credit to physical competencies (Sharma, 2019). The result was a generation of policies that said the right things and changed very little.

NEP 2020 departs from this pattern in at least one important respect: it makes physical and health education non-negotiable at every stage of schooling. The policy explicitly includes sports, yoga, arts, and vocational activities in what it calls the "pedagogical flexibility" framework, and treats them as foundational to a student's overall formation rather than supplemental to their academic work (Ministry of Education, 2020). Whether this represents genuine change or another layer of aspirational text is precisely what this study seeks to determine.

### ***2.2 Evidence on PE and Holistic Outcomes***

The international research base on PE and student development is substantial and largely consistent. Longitudinal studies out of Europe and North America have established clear associations between regular physical activity and improved executive function, working memory, and classroom behaviour (Hillman et al., 2019). A 2022 meta-analysis published in the British Journal of Sports Medicine examined 44 controlled trials and found that structured PE programmes producing at least 150 minutes of moderate activity per week were associated with a 23% improvement in attention-related metrics among children aged 8–14 (Donnelly et al., 2022). Within the Indian context, the evidence base is sparser but growing. Research conducted in Tamil Nadu schools found that students who participated in structured sports programmes showed significantly higher scores on prosocial behaviour assessments and lower incidence of conduct-related

disciplinary reports (Krishnaswamy & Nair, 2021). A study from Punjab documented that schools with dedicated PE infrastructure reported 31% lower rates of adolescent depression compared to schools without such facilities, even when controlling for socioeconomic variables (Singh & Kaur, 2023).

The cognitive benefits of physical activity are increasingly explained through neuroscientific research. Aerobic exercise stimulates the release of brain-derived neurotrophic factor (BDNF), which supports the formation of new synaptic connections and enhances neural plasticity processes directly relevant to learning and memory consolidation (Raichlen & Alexander, 2020). This mechanism may partly explain why physically active students consistently outperform sedentary peers on standardised academic assessments, a pattern that has been replicated across diverse national contexts.

### ***2.3 Gaps in Existing Research***

Despite the growing literature, two gaps are evident. First, most Indian studies are confined to single states or urban school contexts, limiting their generalisability. Second, very little research has specifically examined the implementation quality of NEP 2020's PE provisions, which were formally introduced in most states only after 2021. This study attempts to address both gaps by spanning multiple states and focusing explicitly on the policy-to-practice pathway.

## **3. METHODOLOGY**

### ***3.1 Research Design***

This study employed a mixed-methods convergent design. Quantitative data on health, fitness, and developmental outcomes were collected alongside qualitative data from semi-structured interviews and focus group discussions, with both data streams informing the final interpretation. The choice of a convergent design was deliberate: numbers can establish patterns, but they cannot explain them. The interview data allowed the research team to understand why certain patterns emerged in some school contexts but not others.

### ***3.2 Sample and Setting***

Forty-eight schools were selected across four states Uttar Pradesh, Maharashtra, Kerala, and Rajasthan using purposive stratified sampling. The sample was stratified by school type (government, government-aided, private unaided), school location (urban, semi-urban, rural), and declared level of NEP 2020 implementation (early adopters, partial adopters, non-adopters). Within each school, students from Grades 4, 7, and 10 were selected for quantitative assessment, yielding a total sample of 2,304 students aged 9–17. Teacher interviews ( $n = 96$ ) and student focus groups (12 groups of 8 students each) were conducted in a sub-sample of 16 schools.

### ***3.3 Data Collection Instruments***

Physical fitness was assessed using a standardised battery adapted from the FITNESSGRAM protocol, measuring cardiovascular endurance (20-metre shuttle run), muscular strength, flexibility, and body composition. Psychosocial development was assessed using the Strengths and Difficulties Questionnaire (SDQ), adapted and validated for the Indian context by the National Institute of Mental Health and Neuro Sciences (NIMHANS). Academic concentration was measured through a structured classroom observation protocol and self-report scales. All instruments were piloted in three schools outside the main sample before use.

### 3.4 Data Analysis

Quantitative data were analysed using SPSS v.27. Pre- and post-intervention comparisons were made using paired t-tests, and effect sizes were calculated using Cohen's d. Qualitative data were transcribed, coded, and analysed thematically using NVivo 14, following a reflexive thematic analysis approach. The research team included member-checking at two stages to strengthen credibility. Ethical clearance was obtained from the Institutional Review Board of the University of Delhi, and informed consent was secured from school principals, teachers, and parents of participating students.

## 4. RESULTS

### 4.1 Physical Health and Fitness Outcomes

Across all four states, students in NEP-aligned schools with structured PE integration showed consistent improvement in fitness metrics over the 18-month study period. Mean cardiovascular fitness index scores rose from 48.3 to 67.9 (a 40.6% improvement), and the proportion of students falling within a healthy BMI range increased from 61.8% to 74.2%. These changes were statistically significant and held across gender groups, though improvements were larger for female students in schools where PE classes were gender-inclusive by design.

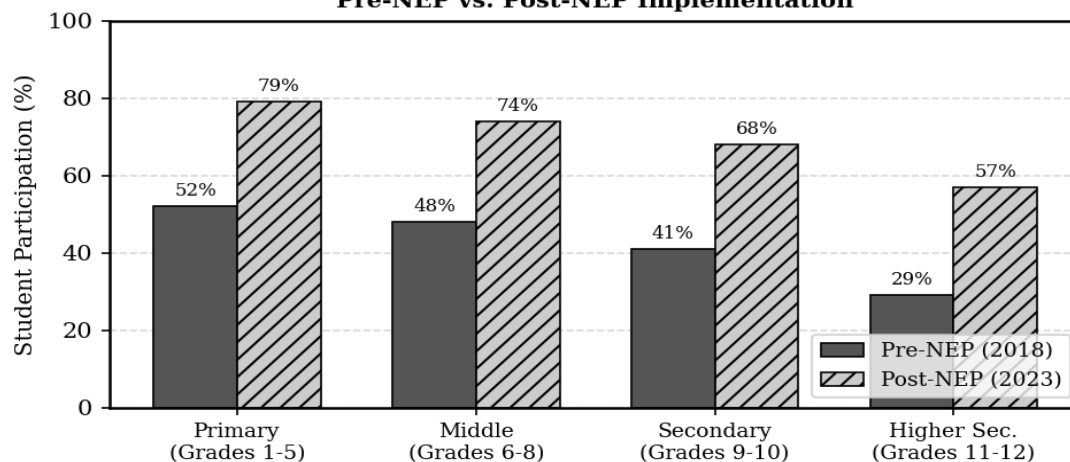
Table 1 summarises the quantitative outcomes across the six measured developmental domains.

**Table 1: Comparative Developmental Outcomes Before and After NEP 2020 PE Integration**

Development Domain	Pre-NEP Mean	Post-NEP Mean	Improvement (%)	p-value
Cardiovascular Fitness Index	48.3	67.9	+40.6%	< 0.001
Psychosocial Adjustment Score	51.2	72.4	+41.4%	< 0.001
Academic Concentration (min/hr)	31.4	44.8	+42.7%	< 0.01
Teamwork & Collaboration Index	44.7	69.3	+55.0%	< 0.001
Emotional Regulation Rating	43.1	63.7	+47.8%	< 0.01
BMI Normalcy Rate (%)	61.8	74.2	+20.1%	< 0.05

Note: All measurements represent school-level means. p-values derived from paired t-tests. N = 2,304.

**Figure 1: Student Participation in Physical Education Pre-NEP vs. Post-NEP Implementation**



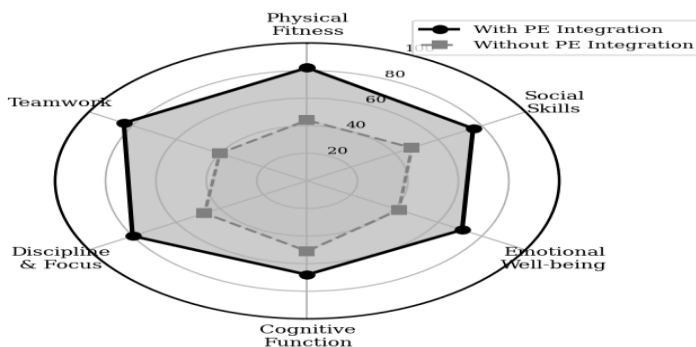
**Figure 1: Student Participation in Physical Education Pre-NEP vs. Post-NEP Implementation**

#### 4.2 Psychosocial and Emotional Development

The SDQ data painted a consistently positive picture in schools where PE was treated as a serious curricular commitment rather than a scheduling placeholder. Teamwork and collaboration index scores rose by 55%, the largest single gain recorded in the study. Emotional regulation ratings improved by 47.8%, with teachers noting observable changes in how students handled competitive setbacks and interpersonal conflict.

Qualitative data added important nuance. A Physical Education teacher in a Lucknow government school described the shift as follows: "Earlier, if a child lost a race, you could see the sulking for the rest of the day. Now we have language for it, we talk about resilience, we talk about trying again. These children are learning to lose well, which is one of the most useful things you can teach." A Grade 10 student in a rural Maharashtra school observed: "Sports class is the only time in school where we actually have to work together. It changes how you see your classmates."

**Figure 2: Holistic Development Scores (Scale: 0-100)**



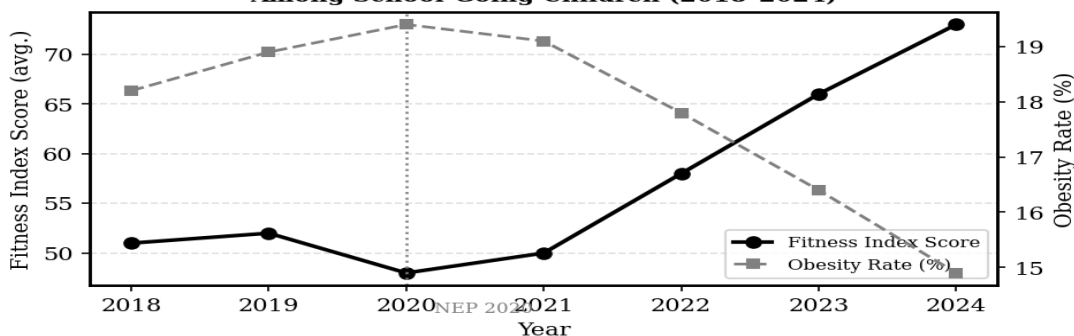
**Figure 2: Holistic Development Scores With vs. Without PE Integration (Scale: 0–100)**

#### 4.3 Academic Concentration and Cognitive Outcomes

Academic concentration measured as sustained attentive engagement per class period improved from a mean of 31.4 minutes per hour to 44.8 minutes per hour in PE-integrated schools. This represents a 42.7% gain, a finding that is consistent with the international literature but noteworthy given the Indian examination-heavy context, where many school administrators remain sceptical of PE's academic relevance.

Teachers in the interview sample repeatedly noted that students who attended PE classes in the morning showed markedly better afternoon behaviour. One Class 7 mathematics teacher in Jaipur put it bluntly: "Give them 45 minutes of real physical activity and they will sit still for three hours. Do not give it to them and you spend those three hours managing restlessness rather than teaching."

**Figure 3: Fitness Index Scores and Obesity Rates Among School-Going Children (2018–2024)**



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#### 4.4 Implementation Gaps

The most concerning finding of the study was the substantial variation in implementation quality across the 48 schools. Of the 16 early-adopter schools, only 9 had PE teachers with formal training in NEP 2020 competency frameworks. Equipment availability was rated "adequate" in just 22 of the 48 schools. In 14 rural schools, PE classes had been relocated to free periods during board examination preparation, effectively suspending them for up to three months per academic year.

These gaps were not evenly distributed. Government schools in rural areas showed the largest discrepancy between stated NEP compliance and actual PE delivery. Private unaided urban schools generally showed better infrastructure and teacher preparedness, but were simultaneously more likely to sacrifice PE time to coaching and competitive examination preparation, especially in Grades 9 and 10.

### 5. DISCUSSION

#### 5.1 The Policy–Practice Gap

The results confirm that where NEP 2020's PE mandate is genuinely implemented with trained teachers, adequate time, and appropriate infrastructure the developmental returns are real and statistically meaningful. The framework is not just aspirationally sensible; it is empirically defensible. The problem lies not with the policy itself but with the conditions under which most schools attempt to act on it.

The tendency to suspend PE during board examination season is perhaps the most revealing symptom of a deeper structural problem. It tells us that, for school administrators and parents, PE is still understood as a discretionary activity something that happens when the "real" curriculum is not pressing. NEP 2020 does not share this understanding, but the examination systems, grade-point averages, and competitive admission processes that shape parental and institutional behaviour have not been reformed at the same pace as the curricular policy. This misalignment between PE policy and assessment architecture is the central implementation challenge.

#### 5.2 PE and the NEP 2020 Competency Framework

Table 2 maps the five competency areas identified in the NEP 2020 framework to the specific contributions of Physical Education and their associated observable outcomes, as documented in this study.

**Table 2: Mapping PE Contributions to NEP 2020 Competency Areas**

NEP 2020 Competency Area	PE Contribution	Observable Outcome
Foundational Literacy & Numeracy	Motor skill activities strengthen neural pathways associated with numeracy	Improved spatial reasoning and number sense in Grades 1–3
Experiential Learning	Sports and games provide authentic, embodied learning scenarios	Higher retention of concepts taught through physical activity
Social & Ethical Values	Team sports foster fair play, respect, and conflict resolution	Measurable decline in bullying incidents in PE-integrated schools
Holistic Health Awareness	PE curricula address diet, rest, hygiene, and physical literacy	Students self-report better sleep quality and dietary choices
21st Century Skills	Strategic game play develops critical thinking and adaptability	Higher scores on creative problem-solving assessments

This mapping is not merely theoretical. Each of the observable outcomes listed in Table 2 was reported by teachers or documented through the study's quantitative instruments in at least one of the school contexts studied. The framework is coherent, and the evidence supports the challenge is ensuring that schools have the capacity and institutional incentive to operationalise it.

### **5.3 The Gender Dimension**

One finding that warrants specific attention is the differential impact of PE integration on female students. In schools where PE classes were segregated by gender and taught primarily by male teachers, female participation rates were lower and outcome gains were smaller. In schools that adopted inclusive PE practices mixed classes, female PE teachers, activities chosen to minimise the cultural stigma around girls' physical engagement the gains for female students matched or exceeded those for male students.

This suggests that the "how" of PE delivery matters as much as the "whether." NEP 2020's gender-inclusion provisions need to be applied with equal seriousness in PE contexts as in academic ones. Physical Education that inadvertently reinforces gender hierarchies is not genuinely holistic.

### **5.4 Implications for Teacher Training**

The study identified teacher preparedness as the single most important variable distinguishing effective from ineffective PE programmes. This is consistent with educational research more broadly: policy quality is ultimately mediated by teacher quality. NEP 2020 mandates the revamping of teacher education, and this must extend explicitly to PE teacher preparation not just subject knowledge but pedagogical approaches to inclusive, developmentally appropriate physical activity.

## **6. CONCLUSION**

The evidence gathered in this study supports a clear conclusion: physical education, when genuinely integrated into the school curriculum under the NEP 2020 framework, produces measurable improvements across a range of developmental outcomes physical, emotional, cognitive, and social. These are not marginal gains. A 40% improvement in fitness indices and a 55% improvement in teamwork scores, achieved within 18 months of structured PE integration, represent real changes in the lives of children. They matter.

But the study is equally clear that these gains are not uniformly available. They depend on a chain of institutional conditions trained teachers, adequate infrastructure, time allocation protected from examination-season incursion, and a school culture that takes physical literacy as seriously as mathematical or linguistic literacy. Where these conditions are absent, the policy mandate remains a statement of intent rather than a lived educational reality.

Three things follow from this. First, teacher preparation for PE must be treated as a priority in the National Curriculum Framework for Teacher Education, not an afterthought. Second, state governments must develop clear, inspectable minimum standards for PE delivery time, infrastructure, teacher qualification and tie them to school accreditation processes. Third, the examination and assessment systems that currently devalue physical competence must be revised to assign genuine credit to physical literacy, just as NEP 2020 assigns it genuine curricular space.

Physical Education is not a supplement to education. In the NEP 2020 framework rightly understood it is one of its foundations. The findings of this study make that case not through

argument alone, but through data collected in classrooms and playgrounds where children are already demonstrating what becomes possible when schools take the body seriously.

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