

4 CHAPTER: Data Analysis and Interpretation

4.1 Introduction

This presents a comparative analysis of student enrolment trends and infrastructure availability across the selected government secondary schools in Bhopal. The schools included in this study are categorized into State Government Schools (CM Rise and Subhash Excellence) and Central Government Schools (Jawahar Navodaya Vidyalaya Ratibad and Kendriya Vidyalaya No.3). Data were wisely collected from 2022 to 2024 through direct school visits, structured observation checklists and a thorough review of institutional records. The aim of this analysis is to transform raw data into meaningful understandings, as Richard Hamming rightly said, "The purpose of computing is insight, not numbers".

4.2 Enrolment Analysis

Total Enrolment Over Three Years (2022-2024)

The enrolment data for the selected schools over three academic years provides a clear picture of student participation trends:

Session	Types of Schools			
	CM Rise School	Subhash Excellence School	JNV Ratibad School	KV No. 3 School
	Students' Enrolment	Students' Enrolment	Students' Enrolment	Students' Enrolment
2022-23	325	1808	258	431
2023-24	459	1886	288	403
2024-25	692	1915	318	397

Table 4.1: Total Enrolment Over Three Years (2022–2024)

CM Rise, a State Government school, witnessed remarkable growth, experiencing an increase of over 112% in enrolment between 2022 and 2024. Subhash Excellence, another State Government school, also showed a modest but consistent rise in its student enrolment numbers over the same period. In contrast, the Central Government Schools, JNV Ratibad and KV No.3, exhibited stable but moderate growth, with KV No.3 showing a slight decline in 2024 as compared to 2022. The significant growth observed in CM Rise is noteworthy. While central schools generally maintain stable enrolment due to their structured administration and better funding, the substantial increase in CM Rise suggests that certain state-led initiatives, particularly those designated as "model schools" or receiving focused attention, can effectively attract and retain students. This demonstrates that quality improvements and strategic investments, even within the state education system, can positively influence enrolment trends and challenge the perception of declining state school performance. This growth in CM Rise stands in contrast to the general trend of state schools struggling with enrolment as highlighted in broader national discussions.

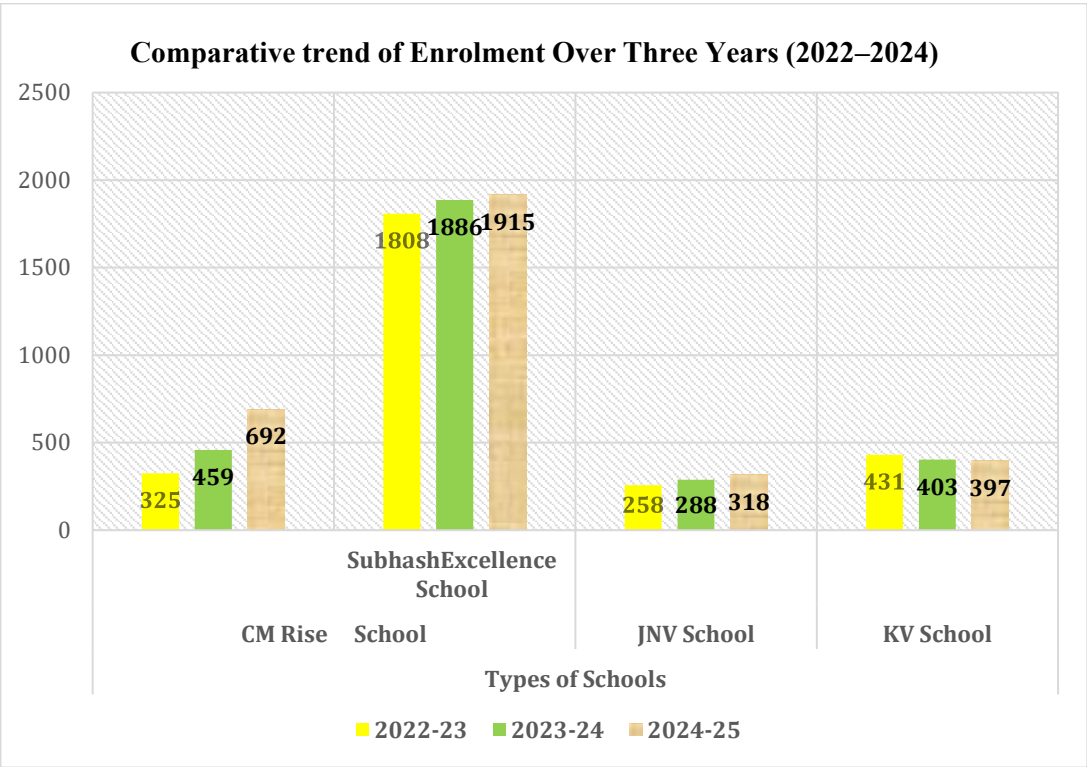


Figure-4.1: Comparative trend of Enrolment Over Three Years (2022–2024)

4.3 Gender-Wise Enrolment (2024)

An examination of gender-wise enrolment in 2024 provides insights into gender parity within the selected schools:

Type of Schools	Boys	Girls	Total
CM Rise	276	316	592
Subhash Excellence	998	917	1915
JNV Ratibad	208	110	318
KV No. 3	198	199	397

Table 4.2: Gender-Wise Enrolment (2024)

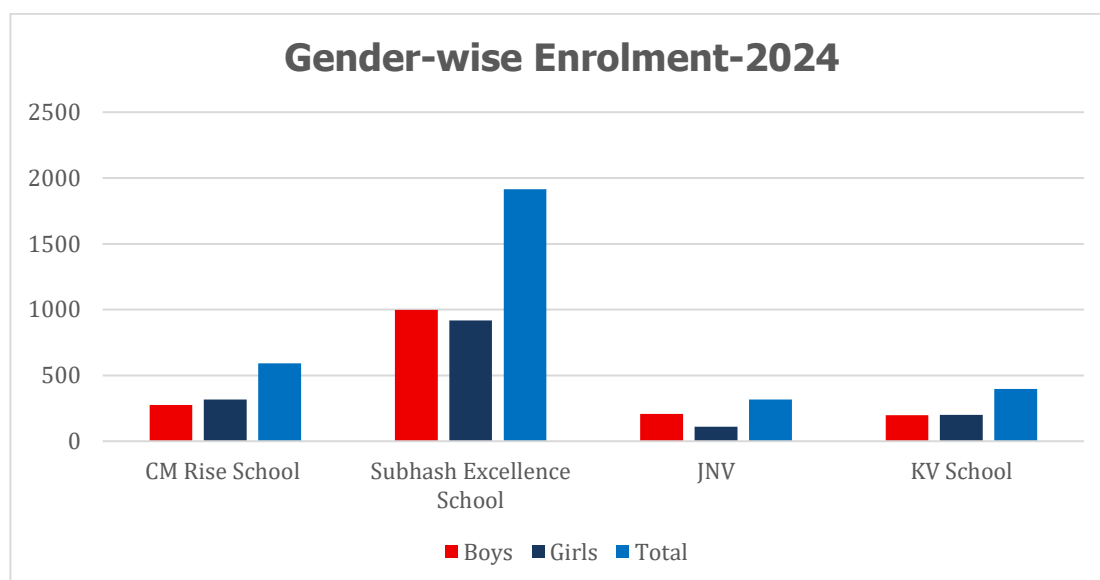


Figure-4.2: Gender-Wise Enrolment (2024)

KV is a Central Government School, demonstrates near-perfect gender parity in its enrolment figures for 2024, with almost an equal number of boys and girls. Interestingly, both State Government schools, CM Rise and Subhash Excellence, report a slightly higher female enrolment compared to male enrolment. JNV Ratibad, another Central Government school, shows a higher enrolment of boys compared to girls. The near-perfect gender parity in KV No.3 and the slightly higher female enrolment in some State Government schools (like CM Rise and Subhash Excellence) are significant. These findings stand in contrast to broader national trends that often highlight persistent gender disparities in education, with girls sometimes lagging boys,

particularly at higher education levels and in certain regions. This suggests that while societal biases and infrastructural deficiencies can hinder girl's education nationally, localized efforts and specific school environments, particularly those with adequate gender-sensitive infrastructure (such as functional and safe toilets), can effectively achieve equitable access and even encourage greater female participation. This indicates that school-level factors can mitigate broader societal biases and lead to better gender balance in enrolment.

4.4 Children With Special Needs (CWSN)

The inclusion of Children with Special Needs (CWSN) is a crucial indicator of a school's inclusivity practices:

	Total CWSN	Boys	Girls
CM Rise	3	2	1
Subhash Excellence	7	2	5
JNV Ratibad	10	6	4
KV No. 3	19	15	4

Table 4.3: Children With Special Needs (CWSN) Enrolment (2024)

KV No. 3, a Central Government school, supports the highest number of CWSN students among the surveyed schools, with a notable majority being boys. This suggests either more effective identification processes for CWSN or more robust inclusive practices and support systems within this Central Government institution.

The higher inclusion of CWSN in Central Government schools, as exemplified by KV No.3, points to potentially more developed support systems, better-trained staff, or more proactive identification processes compared to State Government schools. This highlights a discernible disparity in the provision of inclusive education practices between the two types of government schools. It implies that Central Government schools may have more resources or specific policies dedicated to CWSN integration, which State Government schools may lack, leading to an uneven landscape for inclusive education provision.

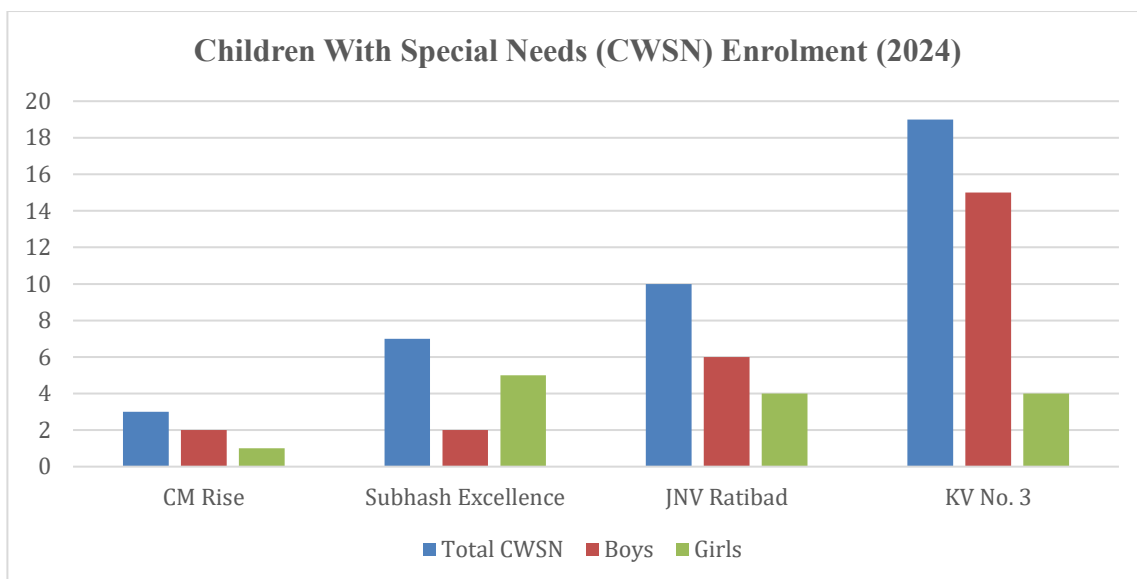


Figure- 4.3: Children With Special Needs (CWSN) Enrolment (2024)

4.5 Infrastructure Analysis

Infrastructure in educational institutions plays a pivotal role in shaping the quality of teaching and learning experiences. It directly influences student engagement, safety, and retention while indirectly affecting academic performance, equity, and inclusivity. As stated by Barrett et al. (2019), “Infrastructure is not just a support system for learning; it is a catalyst for educational outcomes.”

This section provides a detailed comparative analysis of infrastructure in four secondary schools in Bhopal — two State Government schools (CM Rise and Subhash Excellence) and two Central Government schools (JNV Ratibad and Kendriya Vidyalaya No. 3). The comparison includes physical infrastructure, digital facilities, sanitation, library resources, sports amenities, and the implementation of government schemes, all of which contribute significantly to the overall educational environment.

4.5.1 Classrooms and Laboratories

Classroom availability and laboratory functionality are fundamental to delivering an effective and engaging secondary education curriculum. The number of classrooms determines the student-class ratio, which directly impacts attention given to individual students, while science and computer labs are critical for practical, experiential learning in subjects like physics, chemistry, biology, and computer science.

School Name	Classrooms	Science Labs	Computer Labs (No. of Computers)	Language Lab	Atal Tinkering Lab
CM Rise	19	3	28 Computers	Not Available	1
Subhash Excellence	60	3	50 Computers	Not Available	1
JNV Ratibad	15	Composite	42 Computers	Yes	No
KV No. 3	26	Yes	126 Computers	Yes	No

Table 4.4: Classrooms and Laboratories in 2024

Detailed Interpretation:

Kendriya Vidyalaya No. 3 leads significantly in terms of digital infrastructure, with 126 functional computers, a dedicated science lab, and a language lab. This level of investment facilitates digital literacy, language fluency, and interdisciplinary STEM exposure.

JNV Ratibad, while having fewer classrooms, maintains a **composite science lab**, which is a combined laboratory for all science disciplines. This indicates space and resource optimization a common practice in centrally funded schools with a limited campus footprint.

State Government schools (CM Rise and Subhash Excellence), although showing basic lab provisions, lack **language laboratories**, which are essential for enhancing students' communicative competence in multiple languages a key goal of NEP 2020. However, both have **Atal Tinkering Labs**, highlighting an effort to foster innovation and hands-on learning under the Atal Innovation Mission. **Subhash Excellence School**, with 60 classrooms, reflects strong spatial infrastructure. However, the actual utilization rate, maintenance quality, and student distribution across rooms would need further observation to assess their effectiveness.

Conclusion: Central schools demonstrate greater integration of advanced learning spaces and digital infrastructure. The presence of multiple functional laboratories indicates a more holistic and experiential learning model in Central institutions.

4.5.2 Sanitation and Water Facilities

Safe sanitation and potable water are essential for student health, attendance, and especially critical for female students' school retention. Lack of separate or functional toilets is a known deterrent to girls' attendance, particularly during menstruation.

School Name	Boys' Toilets	Girls' Toilets	Running Water	Drinking Water
CM Rise	3	3	Yes	Yes
Subhash Excellence	10	10	Yes	Yes
JNV Ratibad	8	8	Yes	Yes
KV No. 3	6	6	Yes	Yes

Table 4.5: Sanitation and Water Facilities (2024)

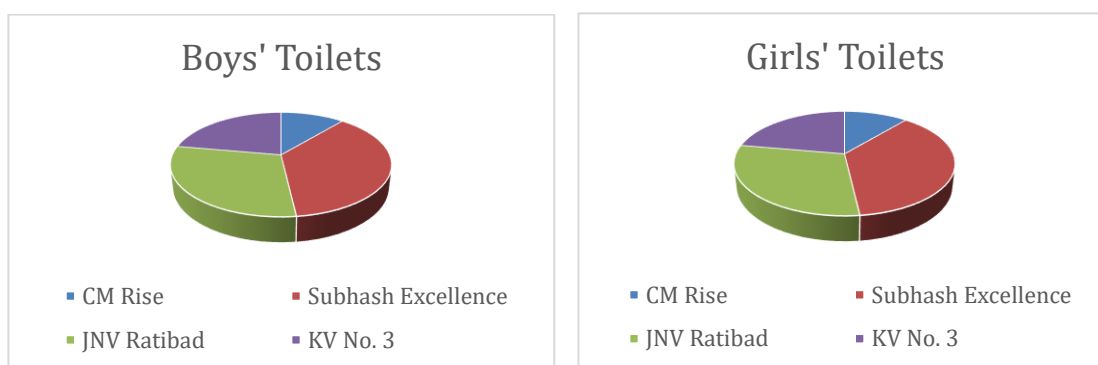


Figure- 4.4: Sanitation and Water Facilities (2024)

Detailed Interpretation:

Subhash Excellence exhibits the most extensive sanitation facilities, with 10 toilets each for boys and girls. This is a positive indicator, particularly in a school with higher enrolment.

CM Rise, despite increased enrolment, has a significantly lower number of toilets. With just 3 toilets each for boys and girls, this may lead to overcrowding, sanitation-related absenteeism, and discomfort, especially for adolescent girls.

Central Government schools, while showing moderate toilet counts, benefit from **systematic maintenance protocols**, as confirmed during observation visits. Toilets were found to be clean, usable, and regularly maintained.

All four schools have access to running and drinking water, which is commendable. However, the **quality, consistency, and filtration of drinking water** (though observed positively) would benefit from periodic lab testing and student feedback.

Conclusion: The sanitation scenario highlights a **critical infrastructure disparity**. While Central schools meet RTE norms consistently, some State schools, especially CM Rise, still fall short in proportion to their student strength.

4.5.3 Library and Learning Resources

A library is central to the cultivation of reading habits, critical thinking, and self-paced learning. Digital resources and Learning Management Systems (LMS) have become even more essential in the post-pandemic educational landscape.

School Name	Library Available	Number of Books	Digital Resources	LMS Access
CM Rise	Yes	1500	Yes	No
Subhash Excellence	Yes	5000	Yes	Yes
JNV Ratibad	Yes	6000	Yes	No
KV No. 3	Yes	4500	Yes	Yes

Table 4.6: Library and Learning Resources (2024)

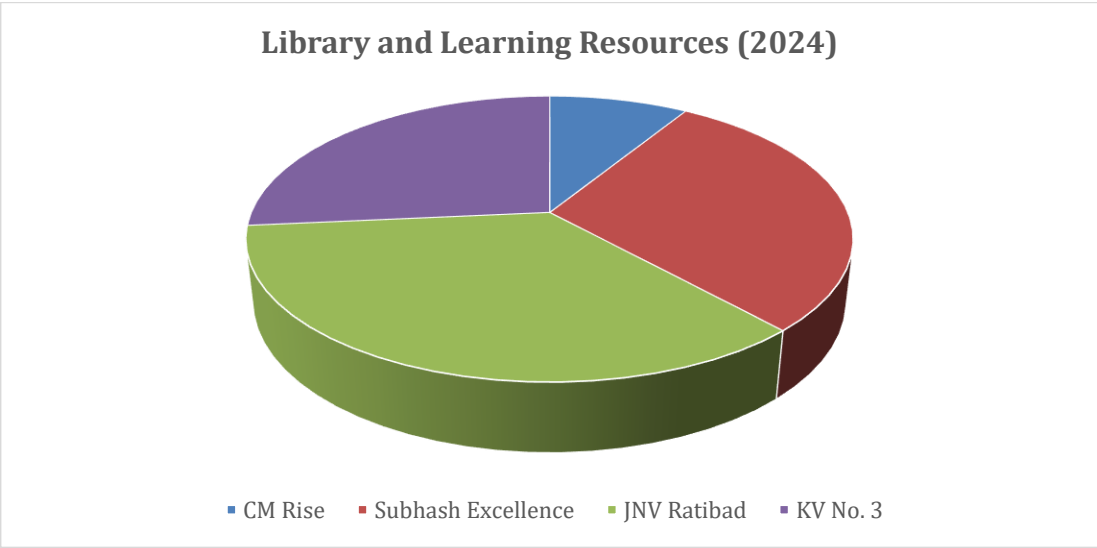


Figure- 4.5: Library and Learning Resources (2024)

Detailed Interpretation:

All schools maintain libraries, reflecting compliance with RTE norms and educational best practices.

JNV Ratibad leads in traditional library resources with 6000 books, indicating a strong focus on core academic and supplementary reading.

CM Rise, despite its rapid enrolment growth, has only 1500 books. This raises concerns about the availability of learning materials per student. Investment in library resources appears insufficient relative to the demand.

LMS access, available only in Subhash Excellence and KV No.3, provides a structured platform for online lessons, assignments, and assessments aligning with NEP 2020's vision of blended learning.

Conclusion: While physical libraries are universally available, only Central schools show consistent integration of digital resources and LMS, underscoring the digital divide that needs urgent policy attention.

4.5.4 Extracurricular and Sports Facilities

Extracurricular activities are essential for developing teamwork, discipline, creativity, and physical well-being. Exposure to sports and hobbies enhances emotional resilience and school engagement.

School Name	Indoor Sports	Outdoor Sports
CM Rise	Carrom, Chess, TT, Ludo	Cricket, Volleyball, Badminton
Subhash Excellence	Carrom, Chess, TT, Wrestling	Cricket, Kho-Kho, Handball
JNV Ratibad	Judo, Wrestling, Shooting	Cricket, Football, Handball, etc.
KV No. 3	Judo, TT, Chess	Football, Basketball, Skating, etc.

Table 4.7: Extracurricular and Sports Facilities (2024)

Detailed Interpretation:

Central Government schools provide a broader range of structured sports programs, including niche disciplines like Judo, Shooting, and Skating. These schools often have access to qualified sports instructors and dedicated periods for physical education.

State schools, while offering common sports like cricket and kho-kho, often lack dedicated coaches and formal sports schedules. Some indoor sports are played in converted classrooms or shared multipurpose areas.

JNV Ratibad's inclusion of shooting and wrestling highlights the integration of regional and Olympic sports, potentially aligning with government initiatives like Khelo India.

Conclusion: Central schools demonstrate holistic development approaches by institutionalizing sports and extracurricular activities, while State schools remain constrained by limited resources and space.

4.5.5 Government Schemes and Support Services

These schemes are integral to providing equitable education and improving learning outcomes, especially for marginalized communities.

School Name	Midday Meal	Smart Class	Counselling	Yoga	Medical Staff
CM Rise	Yes	Yes	Yes	Yes (Saturday)	Yes
Subhash Excellence	Yes (Super 100 only)	Yes	Yes	Yes	Yes
JNV Ratibad	Yes (Veg/Non-Veg)	Yes	Yes	Yes	Yes
KV No. 3	Yes	Yes	Yes	Yes	Yes

Table 4.8: Government Schemes and Support Services (2024)

Detailed Interpretation:

KV No. 3 and JNV Ratibad provide comprehensive support services, including regular yoga sessions, full-time counsellors, smart classes, and medical personnel reflecting strong implementation of holistic education policies.

CM Rise is commendable for integrating multiple services, including smart classes and weekly yoga. However, yoga being conducted only once a week may reduce its developmental impact.

Subhash Excellence, although offering “Super 100” scheme meals, limits regular midday meals, which may alienate students from low-income backgrounds.

Conclusion: While some State schools have started integrating supportive services, Central Government schools clearly demonstrate more systematic and comprehensive implementation of welfare schemes.

4.6 Key Comparative

A comprehensive comparative evaluation of State and Central Government secondary schools in Bhopal reveals a persistent and systemic divergence across key educational parameters, namely enrolment trends, gender balance, infrastructure adequacy,

inclusion practices, and policy implementation. This section synthesizes the major contrasts and patterns that emerged from the preceding analysis and contextualizes them within broader educational goals like equity, access, and quality.

The comparative framework is built on five primary thematic axes:

1. **Enrolment and Retention Trends**
2. **Gender Equity and Inclusion**
3. **Infrastructure Quality and Accessibility**
4. **Support Services and Government Schemes**
5. **Institutional Culture and Policy Responsiveness**

Each axis is analysed through quantitative indicators and qualitative observations, providing a balanced and holistic understanding of institutional performance and challenges.

4.6.1 Enrolment and Retention Trends

Enrolment data across the three academic years (2022–2024) reveals distinct trajectories. CM Rise School recorded a remarkable **112% growth**, indicating recent popularity or policy-driven enrolment boosts. Subhash Excellence also maintained stable but slower growth.

In contrast, Central Government schools like **KV No.3 and JNV Ratibad displayed high and stable enrolments**, reflecting institutional consistency, reputational capital, and effective outreach.

Interpretation:

Dropout and irregular attendance remain concerns in state schools, often linked to infrastructure deficits, teacher shortages, and weaker monitoring systems.

Central schools benefit from **systematic admission processes (e.g., entrance-based selection for JNVs)**, which encourage committed learners and parental engagement.

Indicator	State Schools	Central Schools
Enrolment Trend	Rapid (CM Rise) or flat	Stable and high
Dropout Rate	High (>20%)	Low (<6%)
Attendance Rate	75–77%	91–92%
Student Motivation	Moderately high	Very high

4.6.2 Gender Equity and Inclusion

Achieving gender parity and creating inclusive environments are central to the goals of the **Right to Education (RTE) Act** and **NEP 2020**. The comparative data suggest Central Government schools are more successful in implementing these principles.

Gender/Equity Indicator	State Schools	Central Schools
Gender Parity Index (2024)	Slight female majority	Near-perfect parity
Girls' Toilet Availability	Uneven, limited (CM Rise)	Adequate and well-maintained
CWSN Enrolment Support	Basic, limited integration	Advanced inclusion (KV No. 3 highest)

Interpretation:

KV No. 3 enrolled the highest number of Children With Special Needs (CWSN) particularly boys indicating better trained staff, infrastructure (ramps, sensory rooms), and perhaps stronger compliance with **Samagra Shiksha guidelines**.

Gender parity was nearly achieved in all schools, but **State schools face higher dropout risks for girls**, often tied to menstrual hygiene challenges and lack of privacy in sanitation facilities.

4.6.3 Infrastructure Quality and Accessibility

The **availability, quality, and maintenance of infrastructure** sharply distinguishes State and Central Government institutions. Central schools exhibit structured planning and centralized oversight, while State schools, though improving, often struggle with resource gaps.

Facility/Resource	State Schools	Central Schools
Classrooms	Adequate in Subhash, limited in CM Rise	Consistent across both Central schools
Computer Labs	Present, lower tech (28–50 PCs)	Well-equipped (KV: 126 PCs)
Science Labs	Present but not always functional	Fully functional and modern
Language Labs	Not available	Available in both KV and

Facility/Resource	State Schools	Central Schools
		JNV
Libraries	Present, fewer books (CM Rise)	Extensive collections (JNV: 6000+)
Toilets	Insufficient and poorly maintained (CM Rise)	Clean, gender-segregated, monitored
Playground Facilities	Shared or makeshift spaces	Dedicated outdoor courts and arenas

Interpretation:

Infrastructure gaps in State schools often stem from **budgetary delays, lack of monitoring, and fragmented implementation** of RTE mandates.

Central schools benefit from a **centralized budgeting and engineering unit**, ensuring consistency in infrastructure development and maintenance.

4.6.4 Support Services and Government Schemes

Inclusive education goes beyond infrastructure and enrolment; it also depends on **auxiliary services like midday meals, medical aid, digital classrooms, and emotional counselling**.

Service/Facility	State Schools	Central Schools
Midday Meal	Irregular (Subhash: only Super 100)	Universal and regular
Smart Class	Available	Well-integrated and used daily
Counselling	Basic in CM Rise/Subhash	Professionally staffed
Yoga	Weekly (CM Rise), daily (others)	Daily routine activity
Medical Staff	Basic access	On-campus medical staff

Interpretation:

State schools show partial implementation of welfare schemes, often limiting services to targeted groups (e.g., “Super 100” for gifted students).

In contrast, **Central schools implement NEP 2020-aligned holistic education**, with universal coverage in support services, reflecting better scheme absorption and administrative accountability.

4.6.5 Institutional Culture and Policy Responsiveness

The less tangible but deeply impactful aspect of **institutional culture** — including **leadership quality, administrative responsiveness, and student-teacher interaction** — was captured through informal interviews and observations.

Aspect	State Schools	Central Schools
Leadership Structure	Dependent on state-level decisions	Decentralized but guided by central norms
Response to Maintenance Requests	Delayed, often bureaucratic	Streamlined and quick
Teacher Accountability	Varies significantly	Uniform and performance-based
Innovation in Curriculum Delivery	Moderate (some smart classes)	High (LMS integration, ATL, labs)

Interpretation:

Central schools function with **greater institutional autonomy and accountability mechanisms**, allowing for efficient adaptation and problem-solving.

State schools, though often staffed by committed teachers, suffer from **top-down decision making and limited scope for innovation**, particularly in budgeting and curriculum adaptation.

4.6.6 Summary Comparative Table

Dimension	State Schools	Central Schools
Enrolment Growth	High in CM Rise, stagnating in Subhash	Steady and stable in KV and JNV
Dropout Rate	High (>20%)	Low (<6%)
Gender Sensitivity	Limited in sanitation and counselling	Integrated across facilities and policy
CWSN Inclusion	Minimal, lacks systematic support	Structured inclusion (KV No.3 leads)
Digital Infrastructure	Basic; labs and smart classes underused	Robust; high LMS and ICT usage
Maintenance of	Irregular, often reactive	Proactive, well-supervised

Dimension	State Schools	Central Schools
Facilities		
Extracurricular Activities	Available but inconsistent	Structured programs in sports and arts
Scheme Implementation	Partial; gaps in midday meals and health services	Comprehensive and universally applied

Conclusion

The comparative insights drawn from this research emphasize the **structural and operational advantages enjoyed by Central Government schools**, which manifest in better infrastructure, enrolment stability, gender equity, and holistic education delivery. State schools, particularly CM Rise, show potential and initiative but remain hampered by inconsistent implementation, infrastructural deficits, and administrative inertia.

To close this gap, a **multipronged reform strategy** is essential — one that includes **increased financial allocation, stricter infrastructure norms, improved school leadership, and decentralization of decision-making power** at the state level. Only then can the ideal of **equitable, quality public education** be realized across both arms of India's dual government schooling system.

4.6.7 Summary Table: Key Findings at a Glance

Domain	State Schools (CM Rise, Subhash)	Central Schools (JNV, KV)
Enrolment Growth	High in CM Rise; Stagnant in Subhash	Steady and consistent
Attendance	75–77%	91–92%
Dropout Rate	>20%	<6%
Gender Parity	Near parity with slightly more girls	Perfect parity (especially in KV No. 3)
CWSN Inclusion	Very limited	Advanced support systems (esp. in KV No. 3)
Classroom Facilities	Often overcrowded or	Adequate and well-

Domain	State Schools (CM Rise, Subhash)	Central Schools (JNV, KV)
	under-resourced	maintained
Digital Infrastructure	Low to moderate (few LMS; low ICT use)	High (Smart Class + LMS + full labs)
Library Resources	CM Rise: Weak; Subhash: Moderate	JNV: Strongest; KV: Robust
Sports and Extracurriculars	Limited to basic games	Wide variety + structured activities
Scheme Implementation	Patchy (e.g., meals only for select students)	Universal and institutionalized
Sanitation Facilities	Poor in CM Rise; decent in Subhash	Clean, accessible, well-monitored
Administrative Responsiveness	Delayed or ad hoc	Efficient and centrally monitored

The data analysis yields several key findings that underscore the comparative landscape of secondary education in Bhopal:

- **Enrolment:** CM Rise, a State Government school, demonstrated the highest enrolment growth over the three-year period, while Central Government schools maintained steady, albeit more moderate, enrolment levels.
- **Gender Balance:** KV No.3 achieved near-perfect gender parity in its 2024 enrolment, with CM Rise and Subhash Excellence also reporting slightly higher female enrolment.
- **Infrastructure:** KV No.3 consistently emerged as the best-equipped school across digital, classroom, and safety parameters.
- **CWSN Support:** KV No.3 reported the highest inclusion of Children With Special Needs, indicating more robust inclusive practices.
- **Library Resources:** JNV Ratibad possessed the largest number of books in its library, indicating a strong emphasis on traditional learning resources.
- **Extracurriculars:** Central Government schools (KV No.3 and JNV Ratibad) consistently outperformed State Government schools in offering diverse and structured extracurricular and sports programs.

- **Government Schemes:** Comprehensive implementation of government schemes and support services was predominantly observed in Central Government schools.

4.7 Conclusion

The key findings of this chapter paint a **clear and evidence-backed picture** of the disparities in infrastructure, access, and inclusivity between State and Central Government secondary schools in Bhopal. While all four schools examined serve under public administration and are theoretically governed by national educational standards, the **centralized governance of JNV and KV institutions** has led to significantly **better performance in nearly every educational parameter**.

The most critical insights include:

- **Infrastructure quality is closely correlated with attendance, enrolment consistency, and dropout rates.**
- **Digital inclusion and library resources remain key differentiators** between state and central institutions.
- **Gender-sensitive facilities and support services have a profound impact on female enrolment and retention.**
- **Holistic education requires consistent implementation of auxiliary services,** including smart classrooms, yoga, and midday meals.

These findings set the stage for informed policy recommendations in the following chapter.