

Institutional Drivers and Structural Gaps in School-Based Innovation: Insights from INSPIRE–MANAK Implementation

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Abstract—This study critically examines the implementation dynamics of the INSPIRE–MANAK Scheme through a multi-stakeholder analysis of students, teachers, and Heads of Institutions. The findings reveal a structurally aware yet operationally underperforming innovation ecosystem. At the student level, only 54.11% reported awareness of the scheme, while formal exposure mechanisms remained limited, with merely 20% attending orientation programmes. Satisfaction with orientation was modest, as 32.34% expressed dissatisfaction and 40.58% remained neutral. Although 35.81% of students reported registration, a majority (64.19%) had never registered, with lack of awareness (51.75%) emerging as the principal barrier, followed by time constraints (15.29%) and procedural difficulty (14.73%). Teacher-level data indicate relatively higher awareness (84%) and conceptual understanding (76%); however, only 16% had received formal orientation, and 84% reported no structured training. While 80% of teachers expressed willingness to support students, 72% acknowledged mentoring challenges, primarily due to resource constraints (48%) and awareness gaps (32%). Institutional leadership demonstrated complete awareness (100%), yet only 40% had undergone orientation, of whom merely 20% found it effective. Participation outcomes remained modest, with most institutions reporting involvement of only 1–5 students. The findings underscore a persistent disconnect between policy visibility and participatory depth, suggesting that awareness without sustained capacity-building, leadership training, and resource support limits the development of a robust school-based innovation culture. Strengthening structured professional development and institutional mentoring frameworks is therefore critical for translating policy intent into measurable innovation outcomes.

Index Terms—INSPIRE-MANAK, Innovation ecosystem, Capacity-building asymmetry, prototype/model exhibits, Institutional Support.

I. INTRODUCTION

Innovation in school education has increasingly become a national priority in India, particularly in the context of promoting scientific temper, creativity, and problem-solving abilities among young learners. The Innovation in Science Pursuit for Inspired Research (INSPIRE) Scheme, launched by the Department of Science and Technology (DST), Government of India, represents one of the most significant policy interventions aimed at nurturing scientific talent from an early age. From 2016, called as MANAK (Million Minds Augmenting National Aspirations and Knowledge), this programme, invites original student ideas rooted in scientific inquiry and societal relevance from schools nationwide, targeting one million innovative submissions annually from school students. Selected ideas are nurtured through district, state, and national exhibitions, and receive mentorship and financial support for prototype development, thereby institutionalizing innovation as part of school education (DST, 2019; NIF, 2024). The scheme operates as a pipeline model of talent identification, idea selection, mentorship, and financial assistance, thereby institutionalizing grassroots innovation within the school ecosystem.

INSPIRE–MANAK seeks not merely to reward high academic achievers but to democratize innovation by

reaching students across varied socio-educational contexts. Selected student ideas receive financial support for model development, along with opportunities to present their innovations at district, state, and national platforms. The programme aligns closely with the objectives of the National Education Policy (NEP) 2020, which emphasizes experiential learning, critical thinking, creativity, and multidisciplinary approaches as foundational principles for 21st century education.

Complementing these national efforts, outstanding student innovators supported through INSPIRE–MANAK have opportunities to engage in international science exchange programmes, notably the Japan–Asia Youth Exchange Programme in Science, popularly known as the Sakura Science High School Programme. Administered by the Japan Science and Technology Agency (JST), this initiative has included India as a participating country since 2016, enabling cohorts of Indian students and supervisors to visit Japan for immersive exposure to advanced research institutions, laboratory experiences, and cross-cultural scientific collaboration (Ministry of Education, 2025; JST, 2024). Such international exposures deepen students’ scientific perspectives and align with the experiential learning emphasis of the National Education Policy (NEP) 2020, which advocates for learning that is holistic, inquiry-driven, and globally connected.

At the state level, the effective execution of the scheme depends significantly on institutional coordination. In Jammu & Kashmir, the State Council of Educational Research and Training (SCERT-J&K) functions as the State Nodal Agency responsible for implementing INSPIRE–MANAK at the grassroots level in collaboration with the National Innovation Foundation (NIF), which serves as the knowledge partner of DST. SCERT-J&K facilitates awareness generation, orientation programmes, teacher capacity-building, and district-level coordination to ensure systematic identification and mentoring of student innovators. The collaboration between SCERT-J&K and NIF is central to maintaining procedural clarity, transparency in idea selection, and alignment with national innovation benchmarks.

Despite the strong structural design of the scheme, its effectiveness ultimately depends on how awareness, mentoring, institutional leadership, and resource

availability converge within schools. Earlier empirical investigations (Mir, 2026; Mir et al., 2026; Mir and Lone, 2026) conducted examined the implementation dynamics of INSPIRE–MANAK across different educational settings within the region. These studies highlighted variations in awareness levels, institutional support, teacher engagement, and conversion rates from awareness to active participation. While some settings demonstrated relatively stronger institutional penetration and procedural facilitation, others revealed persistent gaps in orientation outreach, mentoring structures, and resource provisioning. Collectively, these findings underscored that innovation policy outcomes are mediated not merely by scheme design but by local institutional culture, leadership practices, and systemic readiness.

Building upon this continuum of district-level empirical inquiry, the present study further examines the micro-level implementation patterns of INSPIRE–MANAK, focusing on the interplay between student awareness, teacher facilitation, and institutional leadership. By situating the analysis within the broader framework of national innovation policy and state-level execution mechanisms, the study aims to critically assess how effectively the scheme’s objectives are translated into sustained innovation practices within schools.

II. METHODOLOGY

Study Area: Educational institutions (Middle stage & Secondary stage) across District Kupwara of Kashmir Division were selected for the study.

Sample Size: A total of 05 educational institutions comprising a total of 170 students, 25 teachers and 05 Heads of the Institutions (HOI) were selected for carrying out the impact of INSPIRE MANAK programme. A duly framed questionnaire for students, teachers and HOIs were used to ascertain the impact of INSPIRE MANAK scheme.

Statistical Analysis: The retrieved copies of questionnaire were subjected to statistical analysis using Statistical Package for the Social Sciences (SPSS) for proper analysis. The data of the study was analysed through descriptive and inferential statistics.

III. RESULTS

In the current section, the data received from students, teachers and Heads of Institutions from different schools were statistically analysed using appropriate descriptive techniques. Based on this analysis, the following category-wise findings emerged:

Student Responses

The findings indicate moderate but incomplete awareness of the INSPIRE–MANAK Scheme among students. While 54.11% reported being aware of the scheme, a substantial 45.89% remained unaware. Exposure to structured awareness initiatives was also limited, with only 44.70% having attended an awareness programme. Participation in formal orientation programmes was particularly low, as merely 20% of students reported attending one.

Among those who attended orientation programmes, perceptions of effectiveness were mixed: 21.76% were very dissatisfied, 10.58% dissatisfied, 40.58% neutral, 23.52% satisfied, and only 3.52% highly satisfied. Registration levels were also modest, with 35.81% of students having registered under the scheme, while 64.19% had never registered.

The primary reasons cited for non-registration included lack of awareness (51.75%), time constraints (15.29%), difficulty in understanding the registration process (14.73%), lack of interest in innovation (6.23%), and other factors (12%).

Regarding teacher motivation, only 12.35% of students strongly agreed and 24.11% agreed that teachers actively inspire them to participate, while a majority (52.94%) remained neutral. Teacher assistance in research for innovative models was acknowledged by 40.41%, whereas 48.23% were neutral. Similarly, assistance in prototype/model development was confirmed by 34.45%, with nearly half expressing neutrality.

Parental engagement was largely occasional: 35.29% reported active involvement, 57.07% indicated that parents were sometimes engaged, and 7.64% reported no parental engagement. Students suggested greater school-level orientations, workshops, and structured awareness initiatives to improve participation.

Teachers Response

A comparatively high proportion of teachers (84%) reported awareness of the INSPIRE–MANAK

Scheme, and 76% were familiar with its objectives. However, only 16% had attended an orientation programme. Among those oriented, 68% perceived it as effective, 12% were neutral, and 20% considered it ineffective.

Institutional support from Heads of Institutions (HOIs) was viewed positively, with 44% strongly agreeing and 40% agreeing that HOIs promote the scheme. In contrast, perceptions of support from SCERT (state nodal agency) were less favorable, as 52% expressed disagreement or strong disagreement regarding adequate support.

While 80% of teachers reported willingness to support students (strongly agree + agree), actual student participation remained limited. 32% of teachers reported no student participation from their schools, 52% indicated participation of 1–5 students, and only 16% reported more than five participating students.

Guiding students was perceived as challenging by a majority (72% strongly agree + agree). Key barriers identified included lack of resources (48%), inadequate awareness (32%), time constraints (16%), and insufficient teacher guidance (4%). For improving participation, 76% emphasized the need for more training and workshops, followed by regular feedback mechanisms (16%) and enhanced resource availability (8%).

HOI Responses

All HOIs (100%) were aware of the INSPIRE–MANAK Scheme; however, only 40% had received orientation training. Orientation content primarily covered objectives and innovation importance (40% each) and eligibility criteria (20%), but did not sufficiently address teachers' mentoring roles. Consequently, only 20% rated the orientation as effective, while 40% considered it ineffective and 40% remained neutral.

While 60% of schools reportedly organized student orientations, participation levels were modest: 20% of HOIs reported no participation from their schools, whereas 80% indicated participation of 1–5 students.

Teachers' involvement was rated as good or excellent by 60% of HOIs, though 20% each considered it insufficient or merely sufficient. Barriers to participation included guidance-related issues (40%), lack of resources (20%), time constraints (20%), and lack of awareness (20%). Suggested improvements included more orientation programmes and workshops

(40%), enhanced funding and resource provision (40%), and dissemination of printed materials (20%). The findings reveal a pronounced disconnect between institutional awareness and actual student participation in the INSPIRE–MANAK Scheme. Although awareness levels are relatively high among teachers (84%) and universal among HOIs (100%), student awareness remains moderate (54.11%), and registration rates are comparatively low (35.81%). Orientation exposure across stakeholders is limited and often perceived as ineffective, particularly among students and HOIs, indicating deficiencies in the depth and delivery of capacity-building efforts. A large proportion of students expressed neutrality regarding teacher motivation and assistance, suggesting either inconsistent mentoring practices or weak innovation culture within schools. Teachers, despite expressing willingness to support students, reported significant structural barriers, particularly lack of resources, limited awareness, and guidance challenges. Participation levels across institutions remain modest, with most schools reporting involvement of only 1–5 students. Collectively, the data point toward systemic implementation gaps where policy visibility has not translated into sustained grassroots innovation engagement.

IV. DISCUSSION

The findings reveal a clear awareness–participation gap across stakeholder groups. While institutional-level awareness (particularly among HOIs and teachers) is relatively high, student-level awareness and meaningful engagement remain moderate. Limited orientation exposure and perceived ineffectiveness of existing programmes indicate the need for more structured, practice-oriented, and mentoring-focused capacity-building initiatives.

The predominance of neutrality in student responses regarding teacher motivation and support suggests either inconsistent mentoring practices or limited experiential exposure to innovation-based learning. Similarly, teachers' identification of resource constraints and guidance challenges highlights systemic bottlenecks in translating policy intent into grassroots innovation engagement.

These findings align with earlier district-level investigations conducted in Srinagar and Kulgam (Mir, 2026), which reported similar gaps between policy

visibility and effective implementation at the school level. Consistent with previous empirical evidence, awareness, mentoring quality, institutional culture, and resource availability appear to be interdependent determinants of participation outcomes.

Strengthening school-level innovation ecosystems through sustained teacher training, structured mentoring frameworks, improved funding mechanisms, and periodic monitoring could significantly enhance participation under the INSPIRE–MANAK Scheme.

The findings reveal a pronounced disconnect between institutional awareness and actual student participation in the INSPIRE–MANAK Scheme. Although awareness levels are relatively high among teachers (84%) and universal among HOIs (100%), student awareness remains moderate (54.11%), and registration rates are comparatively low (35.81%). Orientation exposure across stakeholders is limited and often perceived as ineffective, particularly among students and HOIs, indicating deficiencies in the depth and delivery of capacity-building efforts. A large proportion of students expressed neutrality regarding teacher motivation and assistance, suggesting either inconsistent mentoring practices or weak innovation culture within schools. Teachers, despite expressing willingness to support students, reported significant structural barriers, particularly lack of resources, limited awareness, and guidance challenges. Participation levels across institutions remain modest, with most schools reporting involvement of only 1–5 students. Collectively, the data point toward systemic implementation gaps where policy visibility has not translated into sustained grassroots innovation engagement.

V. SUMMARY

The overall findings reveal a significant gap between awareness of the INSPIRE–MANAK Scheme and meaningful student participation across stakeholder groups. Among students, awareness stands at 54.11%, leaving 45.89% unaware of the scheme. Participation indicators are even lower, with only 35.81% having registered. Exposure to structured orientation is minimal, as merely 20% attended any formal orientation programme. Even among those who attended, perceptions of effectiveness were weak, with over 32% expressing dissatisfaction and 40.58%

remaining neutral, indicating limited impact of orientation initiatives. The major barriers to registration reported by students include lack of awareness (51.75%), time constraints (15.29%), difficulty understanding the process (14.73%), and limited interest in innovation (6.23%). Additionally, more than half of students (52.94%) remained neutral regarding teacher motivation, and nearly half were neutral about teacher assistance in research and prototype development, reflecting a fragile mentoring ecosystem. Parental engagement was largely occasional (57.07% sometimes engaged), further limiting sustained innovation support at home.

Among teachers, awareness levels are relatively high (84% aware; 76% familiar with objectives), yet only 16% have received orientation training. While 68% of those oriented consider it effective, the low coverage of such training significantly constrains institutional implementation. Teachers identified multiple systemic challenges, including lack of resources (48%), awareness gaps (32%), time constraints (16%), and difficulties in guiding students (72% agreeing that mentoring is challenging). Despite 80% expressing willingness to support students, participation remains modest, with 32% reporting no student participation and 52% reporting only 1–5 participating students. Perceived limited support from the state nodal agency (with 52% expressing dissatisfaction) further underscores coordination gaps.

At the institutional level, while 100% of HOIs are aware of the scheme, only 40% have undergone orientation, and just 20% consider it effective. Orientation content appears incomplete, particularly lacking emphasis on teachers' mentoring roles. Although 60% of schools conduct student orientations, participation remains low, with 80% of institutions reporting only 1–5 participating students. HOIs identified key constraints including guidance issues (40%), lack of resources (20%), time constraints (20%), and limited awareness (20%). Teacher involvement was rated as good or excellent by 60%, yet implementation gaps persist.

Collectively, the evidence highlights systemic challenges: limited and ineffective orientation coverage, inadequate mentoring structures, resource constraints, coordination gaps with nodal agencies, procedural complexity, and insufficient parental engagement. These findings suggest that policy

visibility has not yet translated into a robust school-level innovation culture.

VI. RECOMMENDATIONS TO IMPROVE PARTICIPATION IN INSPIRE-MANAK

- (i) Comprehensive and periodic orientation programmes for students, teachers, and HOIs;
- (ii) Structured mentoring frameworks with defined teacher roles and innovation clubs;
- (iii) Enhanced funding and provision of prototyping resources;
- (iv) Simplified and guided registration processes;
- (v) Dissemination of printed and digital awareness materials;
- (vi) Regular monitoring, feedback, and evaluation mechanisms; and
- (vii) Active parental sensitization initiatives.

A coordinated, resource-backed, and mentoring-focused approach is essential to transform INSPIRE–MANAK from a policy initiative into a sustained grassroots innovation movement within schools.

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