



DISPARITIES IN SCIENCE STREAM ACHIEVEMENT AT THE HIGHER SECONDARY LEVEL: EVIDENCE FROM COHSEM EXAMINATION RESULTS (2021–2025)

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Abstract

This paper explores the achievement gap of community and gender in higher secondary science stream in Manipur based on secondary data of Council of Higher Secondary Education, Manipur (COHSEM) that was released in 2021-2025. The research follows a descriptive and analytical methodology whereby, pass percentages in four communities; General, Other Backward Classes, Scheduled Castes, and Scheduled Tribes are disaggregated by gender. The results show high overall pass percentages in general, but there are still very high levels of variances between communities and regions. These results showed a consistent high score in 2021, which is mostly linked to COVID-19-related internal assessment methods and the results showed a significant drop in 2022 due to the resumption of public examinations, revealing existing disparities, especially among Scheduled Tribe students who were highly concentrated in hill districts. Gender equity is evident since female students performed better than male students in communities. Still, the disadvantages of communities and regions are still restricting the distribution of equal results in science education. The research points out that the pass rates alone are not a guarantee of equity and there should be specific interventions by the regions in line with the equity goals of the National Education Policy 2020.

Keyword:

Science; Disparities; Gender; Community; Manipur.

1. INTRODUCTION

The education of science at the higher secondary level holds a pivotal role in the system of education since it forms a bridge in accessing higher education and work in the fields of science, technology, engineering, and medicine. The science stream performance is widely considered as a measure of individual academic readiness and the quality of education in the system. In underdeveloped countries, science performance, as prevailing inequalities in the wider society, tends to be unequal, so a study of the inequalities is an important step towards planning the educational process fairly (UNESCO, 2017; Tilak, 2018). In India, there still exist a high degree of inequality in the educational attainment within the social groups and genders. In spite of constitutional protection and affirmative action, students with Scheduled Castes (SC), Scheduled Tribes (ST), and





Other Backward Classes (OBC) are often faced with structural disadvantages in terms of poverty, parental education, the quality of schools and learning provisions. Such difficulties are acute especially in science education as it demands a long-term support of instruction, laboratories, and qualified educators (Kingdon, 2007; NCERT, 2020). Gender also overlaps with community status, and it affects access to science learning opportunities and academic success, but recent research shows that gender inequality in some territories is narrowing gradually (World Bank, 2020).

In the case of Manipur, the geographical scenario is distinct in terms of education disparity. It is a state of 16 districts of which are 10 hill districts and 6 valley districts. General, OBC and SC populations mainly constitute the valley districts whereas the ST population is majorly focused in the hill districts. There are educational implications of this spatial segregation. The schools in the hill districts are usually plagued by lack of infrastructure, lack of skilled science teachers, and lab facilities, rugged terrain, and less economic status of families of students. All these influences the involvement and result of students in science streams (Government of Manipur, 2019; Planning Commission of India, 2014). Conversely, the physical infrastructure, teacher supply, and access to the private coach together with robust parental academic support are typically better in the valley districts, which increases the favourable learning conditions (ASER, 2022).

COHSEM is the statutory organization that provides higher secondary examinations in the state. Examination of the COHSEM science examination outcomes in 2021 to 2025 indicate that the pass percentage in General, OBC, and SC groups remain constantly high, whereas in ST students, it remains relatively low and varies. These trends illuminate the same patterns of enduring community and region-specific gaps in science performance, although there has been an improvement in pass percentages over the past few years.

Despite the fact that the National Education Policy (NEP) 2020 is characterized by the importance of equity, inclusion, and special attention of socio-economically disadvantaged groups, there is a lack of empirical research based on recent and official examination data on the state level, especially in Manipur. To fill this gap, the current paper will examine community- and gender-based differences in higher secondary performance in science examinations based on the COHSEM data of 2021-2025. It is hoped that the findings will offer evidence-based information, which can be used by policy makers, educators, and administrators to devise specific interventions to reinforce science education in underprivileged areas.

2. OBJECTIVES OF THE STUDY

1. To examine the year-wise trends in pass percentage of higher secondary science stream students in Manipur from 2021 to 2025.
2. To analyse community-wise differences (GEN, OBC, SC, and ST) in pass percentage in the higher secondary science examination conducted by COHSEM during the study period.
3. To compare gender-wise (male and female) pass percentages in the science stream across different communities from 2021 to 2025.
4. To identify patterns of disparity and convergence in science stream achievement among communities and genders over the five-year period.

3. METHODOLOGY

In this descriptive and analytical study, secondary data was used to compare science stream achievement at higher secondary level in Manipur. The research used official Council of Higher Secondary Education, Manipur (COHSEM) pass percentages for higher secondary science students from 2021-2025. Data were disaggregated by community (GEN), Other Backward Classes (OBC), Scheduled Castes (SC), Scheduled Tribes (ST), and gender (male, female) for social group comparison. The study comprised all COHSEM higher secondary science exam takers during the reference period. The study employed aggregate secondary data, hence no sampling was done. The data were sorted by year and analyzed.





The statistical study was descriptive, using percentages, trend comparison, gender, and community-based differentials to find performance patterns. Annual trend analysis assessed pass % stability, fluctuation, and improvement. Comparative study revealed community and gender variances and similarities across time. Since the study used certified data from a statutory examining authority, reliability and validity were addressed. However, the researchers just analyze pass percentages and do not study accomplishment causes.

4. RESULTS AND DISCUSSION

Table 1: Pass Percentage of Higher Secondary Examination in Science Stream Conducted by COHSEM, by Community and Gender (2021–2025)

		2021	2022	2023	2024	2025
GEN	Male	99.80	89.31	92.93	99.20	95.99
	Female	99.80	93.28	92.83	99.48	96.79
	Total	99.80	91.23	92.85	99.33	96.37
OBC	Male	99.84	94.05	93.21	99.52	97.57
	Female	99.91	96.88	93.42	99.75	98.68
	Total	99.87	95.41	93.31	99.63	98.11
SC	Male	100	94.23	94.02	99.85	96.02
	Female	100	96.41	93.57	99.85	98.07
	Total	100	95.28	93.80	99.85	97.10
ST	Male	99.59	70.19	82.10	96.40	84.43
	Female	99.57	76.50	78.23	96.12	87.75
	Total	99.58	73.63	79.82	96.24	86.30

Source: COHSEM Examination Records (2021–2025).

Objective 1: To examine the year-wise trends in pass percentage of higher secondary science stream students in Manipur from 2021 to 2025.

The analysis in terms of the percentage of the years of study show that the level of performance is high in all four communities throughout the period being studied with significant variations in the years. In 2021, the percentage of passes was very high and even across the General, OBC, SC and ST communities with almost 100 percent of the values condensing to the same. This odd consistency can be explained by the COVID-19 pandemic, as in many ways, higher secondary students have been judged based on the school-level internal assessment as opposed to traditional public examinations. These distorted pass percentages in the period of the pandemic have been observed in a number of education systems.

In 2022, the percentage of the pass decreases, especially in the ST students, which implies that the shift to the traditional examination forms was disproportionately applied to the disadvantaged region students. An incremental recovery is found in 2023, followed by a sharp rise in all communities in 2024, with percentages passing of 96 percent and more. There is an insignificant decrease in 2025, but the overall performance was relatively high, which means that the examination system has stabilized during the post-pandemic time.

Objective 2: To analyse community- wise differences (GEN, OBC, SC, and ST) in pass percentage in the higher secondary science examination conducted by COHSEM during the study period.

The line graph shows a comparative perspective of the pass percentage in the higher secondary science stream, in the four communities namely General (GEN), Other Backward Classes (OBC), Scheduled Castes (SC) and Scheduled Tribes (ST) over a period of five years beginning with 2021 to 2025. In 2021, the four communities reported very high and almost equal percentages of passes that are close to 100 percent. This overlap can be mostly explained by the COVID-19 pandemic where student assessment was more collectively dependent on school-administered internal assessment instead of traditional public





examinations, which led to inflated and uniform student evaluation outcomes throughout communities.

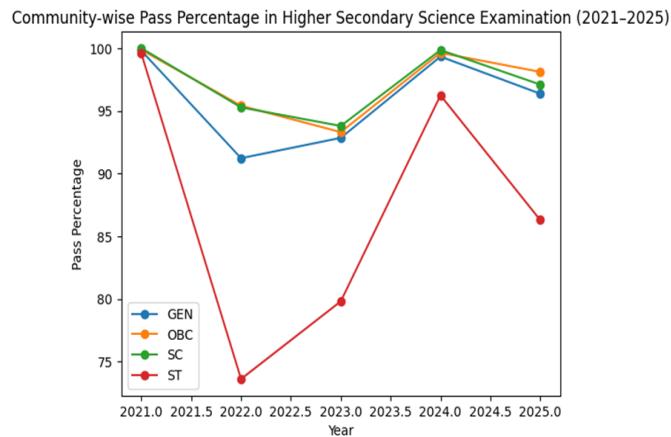


Figure 1: Community-wise Trends in Pass Percentage of Higher Secondary Science Examination in Manipur (2021–2025).

Source: COHSEM Examination Records (2021–2025).

The apparent divergence appears in 2022, as the pass percentages have decreased in all groups, and the most significant decrease is observed among ST students (73.63%). Although the communities GEN, OBC and SC were affected moderately, their performance was over 90 percent which is a sign of comparatively better academic strength. The steep downward trend of ST students indicates more susceptibility to the reversion to formal examination means. In 2023, there is a partial recovery at all the communities. Nevertheless, the recovery rate of ST students (79.82) was lower than the constant performance of GEN, OBC and SC which stabilized at more than 92 percent pass percentages. The pattern is indicative of structural and regional injustice to the ST students. In 2024, the convergence phase will be observed, and all communities will have the percentages of passing over 96 percent, which means the stabilization of the system in the post-pandemic phase. However, in 2025, GEN, OBC, and SC communities were performing at the high level, the ST pupils once again reported a relatively lower percentage of passes (86.30%), which resulted in the reoccurrence of the achievement gaps. On the whole, the five-year trend analysis indicates that despite relatively high percentages in higher secondary science pass in Manipur, the community-related disparities (especially in the case of ST students) have still existed. The results highlight the significance of the specific academic and infrastructural intervention in the hill districts to achieve equal results in the field of science.

Objective 3: To compare gender-wise (male and female) pass percentages in the science stream across different communities from 2021 to 2025.

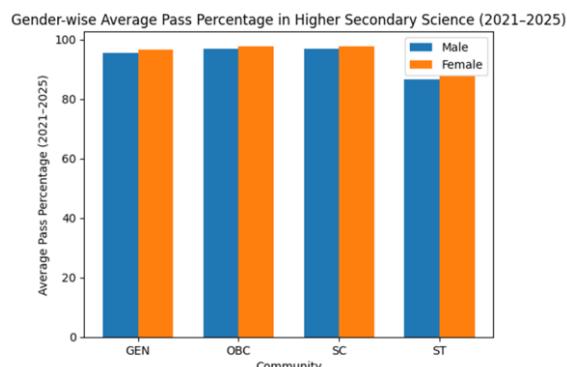


Figure 2: Gender-wise Average Pass Percentage in Higher Secondary Science across Communities in Manipur (2021–2025).

Source: COHSEM Examination Records (2021–2025).





The grouped bar graph gives average pass percentages of male and female students in science stream in four communities, that is, GEN, OBC, SC, and ST during the span 20212025. The graph depicts the obvious and consistent pattern: the female students have a more satisfying score than the male students in every community.

In the General community, there is a slight yet consistent difference in favor of female students over males, with rather equal access to educational opportunities and academic support. This gender advantage is even more evident in the OBC and SC groups, where female students do show better academic results as compared to male students. It is a trend, which implies that girls should become more involved in the field of science, persistent and scholarly even in the socially disadvantaged populations.

Again in the Scheduled Tribe (ST) community, even though female students outperform male students, the percentage of passes between the two genders are significantly lower than the rest of the communities. This implies that gender parity in the ST group is trending in the right direction, but, generally, there exist constraints in the community level, including geographical isolation, inadequate infrastructures, lack of trained science instructors and insufficient academic support that hinder overall performance.

According to the findings, it is evident that gender privilege alone does not necessarily lead to community equity. Women students can be doing better than males but when the same occur in both sexes that are in structurally disadvantaged situations, the performance of both groups is still influenced. This highlights the necessity to tackle regional and community-specific obstacles and gender-specific interventions.

Objective 4: To identify patterns of disparity and convergence in science stream achievement among communities and genders over the five-year period.

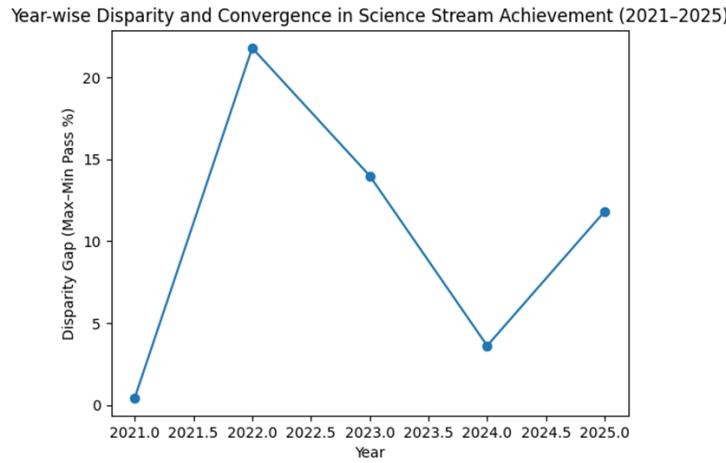


Figure 3: Year-wise Disparity and Convergence in Higher Secondary Science Achievement across Communities in Manipur (2021–2025).

Source: COHSEM Examination Records (2021–2025).

The disparity convergence trend graph is used to show the change in the science stream outcomes over the years by communities by determining the difference between the worst-performing groups within the year and the top-performing groups between 2021 and 2025. The gap in the disparities is extremely small in 2021, which shows the close approach to the total convergence of pass percentages in all four communities. This convergence is mostly unnatural and can be explained by the COVID-19 epidemic when school-based assessment was used as the main method of evaluation instead of external exams, and similar results were achieved by the student.

The gap between the disparity peaks in 2022, but the disparity gap steeply increased throughout the five-year period. This dispersion suggests that the effect of the reversion to traditional examination systems is not equal as ST students have reported significantly lower success rates in terms of pass percentage and other communities were reasonably stable in





course performance. Despite the fact that the gap was reduced to some extent in 2023, there was a wide disparity, which implied uneven recovery among communities.

The year 2024 is a stage of significant convergence and the gap between the disparities was the smallest since the post-pandemic era. This is an indicator of a short-term system wide stabilization and enhanced academic alignment of communities. Nevertheless, this convergence was weak since the gap in disparity increased once again in 2025, mostly because of a new decrease in ST performance in comparison to General OBC and SC communities.

Overall, it can be seen that the graph shows that gender-based inequities seem to be decreasing, but community-and region-based inequities continue to exist. The results show that current policy interventions have been comparatively good in gender equity promotion but infamous in structural disadvantages in hill-district and ST students. Long-term convergence will thus be based on specific investments in infrastructure, teacher placement and academic support systems in hill districts, and not temporary or even homogenous policy initiatives.

5. OVERALL DISCUSSION

In the current research, higher secondary science stream community- and gender-wise trends in achievement were analysed using COHSEM examination data between 2021 and 2025. Although overall pass percentages in science showed consistent high values throughout the period of study, the findings indicate that there were always inequalities among communities and regions which are the indicators of the structural differences within the education system. Any high and consistent pass percentages in 2021 need to be viewed with some caution since they are concomitant to the COVID-19 pandemic whereby the evaluation of the students was predominantly on school-level internal examinations and not on the national exams. Pass rate inflation has been reported to be experienced across Indian school boards in a similar way during this period (NCERT, 2021; UNESCO, 2021). The dramatic fall that was witnessed in 2022, especially among Scheduled Tribe (ST) students, shows that the reversion to traditional examination forms had a disproportionate impact on students of disadvantaged backgrounds.

On the analysis of community-wise, it was observed that students belonging to General, OBC and SC communities had higher and more consistent pass percentages, and ST students registered low and more varying results. This trend represents the socio-regional situation in Manipur, in which the population of the STs is largely concentrated in the hill districts with infrastructural constraints, lack of trained teachers in the sciences, and economic obstacles (Planning Commission of India, 2014; Tilak, 2018). The results concerning gender also show that female students are more successful than male students in most communities, which is consistent with the recent data on better education results among girls (World Bank, 2020; ASER, 2022). Nevertheless, the fact that ST students, both boys and girls, continued to perform poorly, indicates that gender equity does not guarantee educational equity. Though temporary convergence in the achievement was seen in 2024, inequity was observed again in 2025, and thus, the development of specially designed, region-specific solutions in line with the equity vision of the National Education Policy 2020 was required to ensure a lasting change in science education.

6. CONCLUSION

The paper examined community- and gender-based higher secondary science success in Manipur based on 2021-2025 COHSEM results. The data show that, even while science pass percentages are typically high, community differences remain large, therefore high accomplishment does not always reflect the absence of inequitable education outcomes. The extraordinarily high and constant pass rates in 2021 were critically affected by COVID-19 assessment processes, which were based on internal evaluation, not external exams, and should be considered with concerns.

With the return of regular exams, Scheduled Tribe students had lower and more inconsistent pass rates than General, OBC, and SC students. These differences are caused by structural and regional concerns in hill districts such poor infrastructure, a shortage of trained scientific teachers, and academic facilities. The data also showed that female students outperformed male pupils in most locations, suggesting hopeful gender fairness in science education.





The discussion reveals that gender parity alone cannot achieve community equity. Even though partial convergence in achievement occurred in 2024, the outcomes were minimal, and in 2025, the discrepancies returned. Overall, the research emphasizes the necessity for ongoing and targeted interventions in disadvantaged communities to ensure that scientific education gains benefit all students.

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