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Scientific Temper Among B.Ed. Trainees: A Comparative Study of Government and Grant-in-Aid Colleges in Mysuru

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Abstract:

This study investigates the level of Scientific Temper among B.Ed. trainees of Government and Grant-in-Aid colleges, a critical attribute for educators in a rapidly evolving, science-driven world. Employing a descriptive survey methodology, the research assesses the trainees' disposition towards Critical Mindedness, Open-Mindedness, Respect for Evidence, Suspended Judgment, Willingness to Change Opinions, Questioning Attitude and Objectivity and explores the factors influencing these attitudes, including academic background and exposure to pedagogical methods.This research paper attempts to study the Scientific Temper of B.Ed. trainees of Government and Grant-in-Aid B.Ed. Colleges of Mysuru affiliated to University of Mysore. The sample consists of 293 (74 Government and 219 Grant-in-Aid) B.Ed. trainees selected randomly. The data were collected by using Prof. K.S.Misra's scale of Scientific Temper Inventory (S.T.I.). The findings revealed that both B.Ed. trainees of Government and Grant-in-Aid colleges in Mysuru possessed a High level of Scientific Temper. However, B.Ed. trainees of Government college showed a slightly higher level of Scientific Temper compared to B.Ed. trainees of Grant-in-Aid colleges. It also showed that, there is no significant difference between B.Ed. trainees of Government and Grant-in-Aid colleges on various dimensions of Scientific Temper.

Key words: Scientific Temper, B.Ed. Trainees, Teacher Education, Comparative Study, Government Colleges, Grant-in-Aid Colleges, Mysuru.

1. INTRODUCTION:

Scientific temper is an essential cognitive and intellectual disposition characterized by objectivity, a questioning attitude, and a commitment to evidence-based reasoning, which serves as a foundational pillar for effective pedagogical practice in the 21st century. For prospective educators enrolled in Bachelor of Education (B.Ed.) programs, cultivating this rational mindset is critical, as it directly influences their ability to foster critical thinking, inquiry, and scientific literacy among future generations of students. Despite the pivotal role of teacher training institutions in shaping these dispositions, there remains a need to examine whether variations in institutional management specifically between Government and Grant-in-Aid colleges, impact the development of scientific temper among teacher trainees. This study addresses this gap by conducting a comparative analysis of

B.Ed. trainees in Mysuru, evaluating their levels of critical mindedness, open-mindedness, respect for evidence, and other key dimensions to determine if the nature of the institution serves as a significant differentiator in preparing teachers to navigate an increasingly complex and evidence-driven educational landscape.

II. LITERATURE REVIEW:

Stephen and Musthafa (2018) examined whether gender and subject specialization influence the scientific temperament of prospective teacher educators. The study revealed variations in scientific temperament across demographic variables such as gender and academic subject background. The findings emphasized the need for teacher education programmes to promote scientific temper equally among all prospective teachers.

Yadav (2018) highlighted the importance of developing scientific temper in modern society to promote rational thinking and scientific attitudes among individuals. The study emphasized that education plays a crucial role in cultivating inquiry, critical thinking, and evidence-based reasoning among students. It concluded that fostering scientific temper is essential for social progress and informed decision-making.

Acharya (2021) investigated the level of scientific temper among undergraduate students with reference to selected demographic variables. The study compared students on factors such as gender and academic background to identify differences in their scientific outlook. The findings indicated variations in scientific temper among students, highlighting the role of educational and demographic factors in shaping scientific attitudes.

Padhan, Suna, and Meher (2023) conducted a study to examine the level of scientific temper among undergraduate students with respect to demographic variables. The study found that most students possessed an above-average level of scientific temper, with higher levels observed among students from urban areas and joint families. However, no significant differences were found in scientific temper with regard to gender, stream, religion, or caste.

Khan and Khangai (2024) analyzed the relationship between the ancient Indian education system and the development of scientific temper from a historical perspective. The study highlighted that traditional Indian knowledge systems emphasized observation, logical reasoning, and empirical understanding in areas such as mathematics, astronomy, medicine, and environmental practices. The authors concluded that ancient educational traditions contributed significantly to the development of inquiry, rational thinking, and scientific outlook in society.

Panchal and Mahadevaswamy (2025) examined the relationship between scientific temper and professional development among teacher educators. The study revealed a significant positive association between scientific temper and the professional growth of teacher educators. It concluded that educators with a strong scientific outlook are more likely to adopt innovative and evidence-based teaching practices, enhancing their professional effectiveness.

Sharma and Tripathy (2025) investigated teachers' perceptions regarding the concept and importance of scientific temper in school education. The study surveyed a large number of trained graduate teachers and found that many teachers had limited awareness of the term "scientific temper," though they acknowledged its importance in developing rational thinking among students. The authors emphasized the need for orientation and training programs to strengthen teachers' understanding and promotion of scientific temper in classrooms.

Shitire, Yadav, and Odyuo (2025) conducted a study to examine the level of scientific temper among B.Ed. students in Nagaland. The study used a sample of 550 students from eight B.Ed. colleges and applied statistical techniques such as mean, SD, t-test, and ANOVA for analysis. The findings revealed that B.Ed. students possessed a high level of scientific temper and no significant differences were found with respect to gender, management, and pedagogy.

Khan (2018) analyzed the representation of science, scientific literacy, and scientific temper in school curricular documents. The study highlighted that educational curricula emphasize inquiry, critical thinking, and rational understanding as essential components of scientific temper. It concluded that curriculum frameworks play a significant role in promoting scientific attitudes and scientific literacy among learners.

III. OBJECTIVES OF THE STUDY:

The present study was undertaken to achieve the following objectives:

1. To study the level of Scientific Temper among B.Ed. trainees of Government and Grant-in-Aid colleges.
2. To compare the B.Ed. trainees of Government and Grant-in-Aid colleges on various dimensions of Scientific Temper.

IV. HYPOTHESES OF THE STUDY:

1. There is no significant difference between B.Ed. trainees of Government and Grant-in-Aid colleges on various dimensions of Scientific Temper.

V. METHODOLOGY:

The proposed study was carried on by quantitative research method. The population of the present study confined to as the B.Ed. trainees in various B.Ed. colleges of Mysuru affiliated to University of Mysore in the academic year 2024-25. Three B.Ed. colleges of Mysuru were randomly selected. There were total 293 B.Ed. trainees as sample (74 Government and 219 Grant-in-Aid). A Scientific Temper Inventory (S.T.I.) which was constructed and standardized by Prof. K.S. Misra, has been used to collect data. It consists of 28 items according to their area of Scientific Temper. The scale measures seven dimensions of Scientific Temper- (i) Critical Mindedness, (ii) Open-Mindedness, (iii) Respect for Evidence (iv) Suspended Judgment (v) Willingness to Change Opinions (vi) Questioning Attitude (vii) Objectivity

The reliability coefficient is 0.7214 and validity is 0.633. In this study, The raw data was subjected to percentage, mean, S.D. and t-test for statistical treatment. The following table shows the statistical analysis of the data. t-test was used to compare the various dimensions of Scientific Temper of Arts and Science B.Ed. teacher trainees.

VI. STATISTICAL ANALYSIS AND INTERPRETATION:

The raw data was subjected to percentage, mean, S.D. and t-test for statistical treatment. The following table shows the statistical analysis of the data.

SECTION 'A'-DESCRIPTIVE ANALYSIS:

Percentage computation of B.Ed. trainees of Government and Grant-in-Aid colleges on Scientific Temper.

Table 1.1: Showing the overall Percentage of Scientific Temper among B.Ed. trainees of - Government and Grant-in-Aid colleges.

Levels	**N**	**Percentage**
Extremely High Scientific Temper	98	33.45
High Scientific Temper	79	26.96
Above Average Scientific Temper	71	24.23
Average Scientific Temper	36	12.29
Below Average Scientific Temper	9	3.07
Low Scientific Temper	0	0
Extremely Low Scientific Temper	0	0
Total	**293**	**100.0**
Mean Score	**112.44**	

Table 1.1 presents a descriptive analysis of the overall percentage of scientific temper among 293 B.Ed. trainees from Government and Grant-in-Aid colleges, revealing a generally high level of scientific disposition across the sample. The data indicates that a significant majority of the trainees fall into the upper categories, with **33.45%** (N=98) demonstrating an "Extremely High" level and **26.96%** (N=79) exhibiting a "High" level of scientific temper. Furthermore, **24.23%** of the participants possess an "Above Average" scientific temper, while **12.29%** are classified as "Average". Notably, only a marginal **3.07%** of trainees scored in the "Below Average" category, and there were no instances of "Low" or "Extremely Low" scientific temper reported. With an overall mean score of **112.44**, these findings suggest that the sampled B.Ed. trainees in Mysuru possess a strong foundation in the rational and objective thinking required for their future roles as educators.

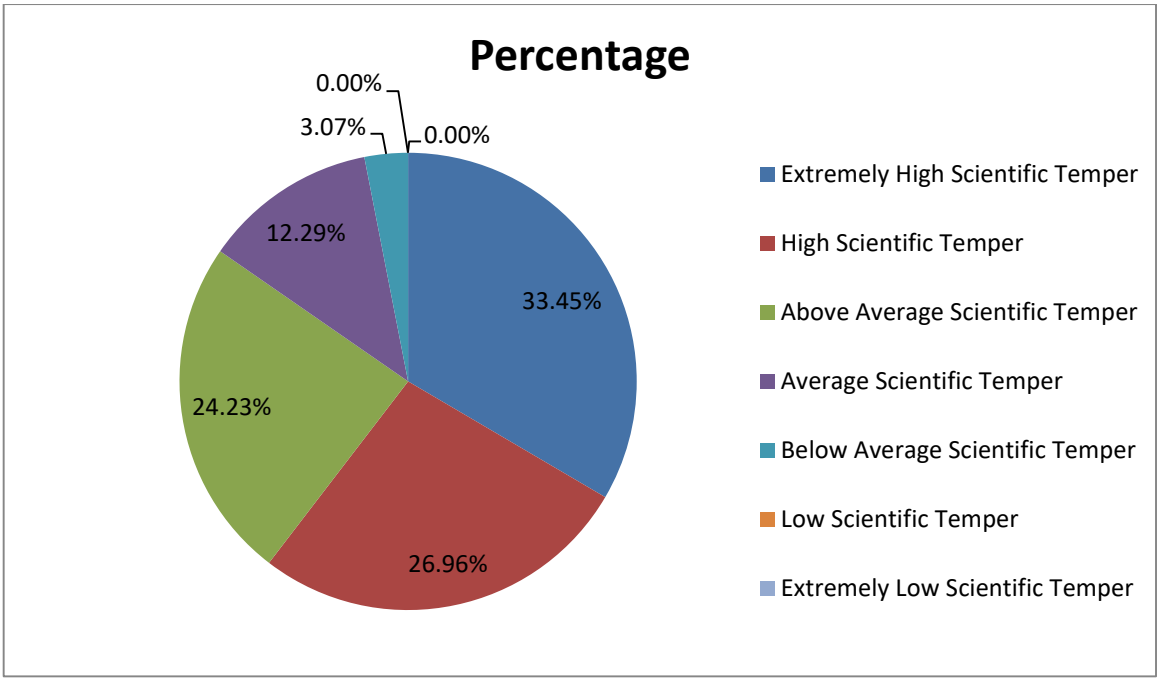

Fig. 1.1: Showing the overall Percentage of Scientific Temper among B.Ed. trainees of Government and Grant-in-Aid colleges.

Table 1.2: Showing the percentage comparison between B.Ed. trainees of Government and Grant-in-Aid colleges on levels of Scientific Temper

Levels	**Government**		**Grant-in-Aid**	
	N	**Percentage**	**N**	**Percentage**
Extremely High Scientific Temper	21	28.38	77	35.16
High Scientific Temper	18	24.32	61	27.85
Above Average Scientific Temper	21	28.38	50	22.83
Average Scientific Temper	12	16.22	24	10.96
Below Average Scientific Temper	2	2.70	7	3.20
Low Scientific Temper	0	0	0	0
Extremely Low Scientific Temper	0	0	0	0
Total	**74**	**100.0**	**219**	**100.0**

Table 1.2 presents a comparative percentage analysis of scientific temper levels between B.Ed. trainees from Government (N=74) and Grant-in-Aid (N=219) colleges. The data reveals that a higher proportion of trainees from Grant-in-Aid colleges possess an "Extremely High" level of scientific temper at **35.16%**, compared to **28.38%** in Government colleges. Similarly, the "High" scientific temper category favored Grant-in-Aid institutions (**27.85%**) over Government institutions (**24.32%**). Conversely, Government colleges showed a higher concentration of trainees in the "Above Average" (**28.38%**) and "Average" (**16.22%**) categories compared to their Grant-in-Aid counterparts, who recorded **22.83%** and **10.96%** in those respective levels. Both institutional types reported negligible figures for "Below Average" levels, **2.70%** for Government and **3.20%** for Grant-in-Aid. while neither group recorded any trainees in the "Low" or "Extremely Low" categories.

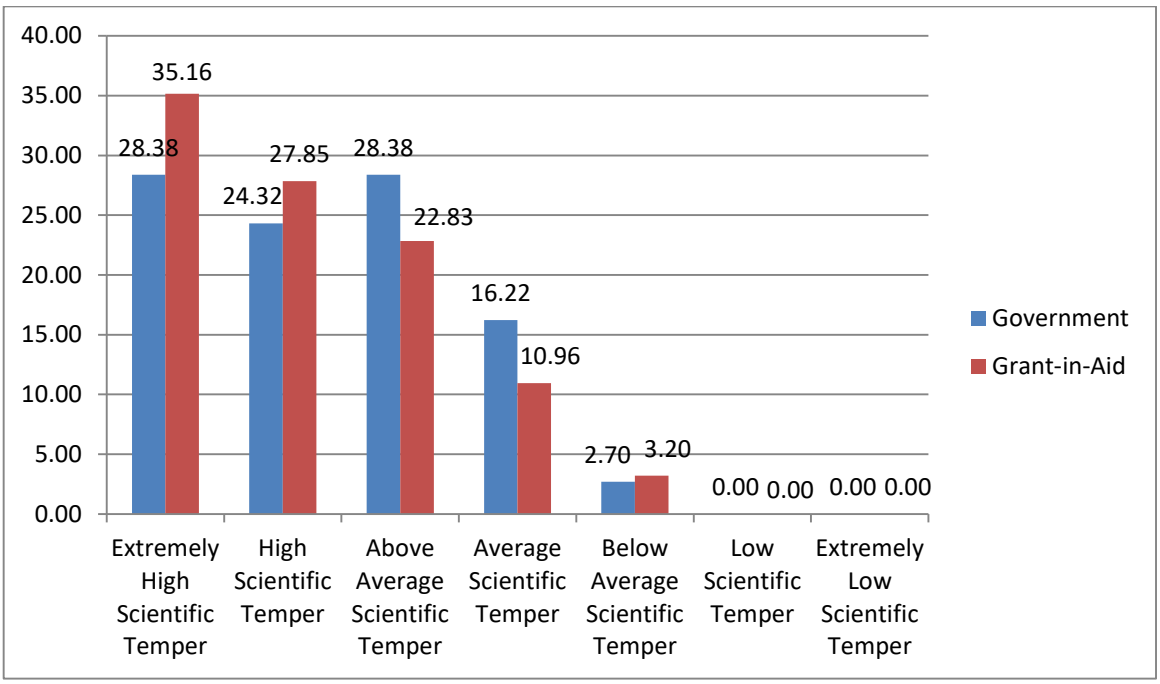

Fig. 1.2: Showing the percentage comparison between B.Ed. trainees of Government and Grant-in-Aid colleges on levels of Scientific Temper.

SECTION 'B'-COMPARATIVE ANALYSIS

Comparative analysis of B.Ed. trainees of Government and Grant-in-Aid colleges on various dimensions of Scientific Temper.

Table 2.1: Showing the mean difference between B.Ed. trainees of Government and Grant-in-Aid colleges on 'Critical Mindedness' dimension of Scientific Temper

Dimension	Group	N	Mean	Std. Deviation	t-value	Level of Significance
Critical Mindedness	Government	74	14.99	2.54	0.6900	**
	Grant-in-Aid	219	14.84	2.89		

**= not significant at 0.05

Table 2.1 presents a comparative analysis of the "Critical Mindedness" dimension of scientific temper between B.Ed. trainees from Government and Grant-in-Aid colleges, utilizing a t-test to determine the significance of the mean difference. The results show that trainees from Government colleges attained a slightly higher mean score of **14.99** (SD = 2.54) compared to their counterparts in Grant-in-Aid colleges, who recorded a mean of **14.84** (SD = 2.89). Despite this marginal numerical difference, the calculated **t-value of 0.6900** was found to be statistically non-significant at the **0.05 level**. This suggests that the type of institution does not significantly influence the critical-mindedness of B.Ed. trainees, indicating a uniform level of analytical thinking across both types of colleges in the study area.

Table 2.2: Showing the mean difference between B.Ed. trainees of Government and Grant-in-Aid colleges on 'Open-Mindedness' dimension of Scientific Temper

Dimension	Group	N	Mean	Std. Deviation	t-value	Level of Significance
Open-Mindedness	Government	74	14.92	2.54	0.7893	**
	Grant-in-Aid	219	15.02	2.83		

**= not significant at 0.05

Table 2.2 illustrates the comparative mean scores for the "**Open-Mindedness**" dimension of scientific temper among B.Ed. trainees from Government and Grant-in-Aid institutions. The data reveals that trainees from Grant-in-Aid colleges achieved a slightly higher mean score of **15.02** (SD = 2.83) compared to the mean score of **14.92** (SD = 2.54) recorded by trainees from Government colleges. To determine if this variation was statistically meaningful, a t-test was applied, resulting in a **t-value of 0.7893**, which is **not significant at the 0.05 level**. These findings indicate that there is no substantial difference in the level of open-mindedness between the two groups, suggesting that the type of management of the teacher training institution does not play a significant role in shaping this specific cognitive trait among the trainees.

Table 2.3: Showing the mean difference between B.Ed. trainees of Government and Grant-in-Aid colleges on 'Respect for Evidence' dimension of Scientific Temper

Dimension	Group	N	Mean	Std. Deviation	t-value	Level of Significance
Respect for Evidence	Government	74	17.31	2.21	0.6755	**
	Grant-in-Aid	219	17.43	2.06		

**= not significant at 0.05

Table 2.3 provides a comparative assessment of the "**Respect for Evidence**" dimension of scientific temper among B.Ed. trainees from Government and Grant-in-Aid colleges. The statistical analysis reveals that trainees from Grant-in-Aid colleges obtained a slightly higher mean score of **17.43** (SD = 2.06) compared to those from Government colleges, who recorded a mean score of **17.31** (SD = 2.21). To evaluate the significance of this variance, a t-test was conducted, yielding a **t-value of 0.6755**, which is **not significant at the 0.05 level**. Consequently, the data indicates that there is no statistically significant difference between the two groups regarding their respect for evidence, suggesting that both institutional environments foster a comparable appreciation for factual and empirical validation among prospective teachers.

Table 2.4: Showing the mean difference between B.Ed. trainees of Government and Grant-in-Aid colleges on 'Suspended Judgment' dimension of Scientific Temper

Dimension	Group	N	Mean	Std. Deviation	t-value	Level of Significance

Suspended Judgment	Government	74	15.63	3.09	0.0100	**
	Grant-in-Aid	219	16.58	2.59		

**= not significant at 0.05

Table 2.4 details the comparative analysis of the "**Suspended Judgment**" dimension of scientific temper between B.Ed. trainees from Government and Grant-in-Aid colleges. The descriptive statistics indicate that trainees from Grant-in-Aid colleges achieved a higher mean score of **16.58** (SD = 2.59) compared to the mean of **15.63** (SD = 3.09) recorded by their peers in Government institutions. To evaluate the statistical significance of this difference, a t-test was employed, yielding a **t-value of 0.0100**. This value was found to be **not significant at the 0.05 level**, leading to the conclusion that there is no substantial variation between the two groups in their ability to withhold judgment until sufficient evidence is presented. These results further support the observation that institutional management type does not significantly impact specific dimensions of scientific temper among prospective teachers in the study area.

Table 2.5: Showing the mean difference between B.Ed. trainees of Government and Grant-in-Aid colleges on 'Willingness to Change Opinions' dimension of Scientific Temper

Dimension	Group	N	Mean	Std. Deviation	t-value	Level of Significance
Willingness to Change Opinions	Government	74	15.46	2.97	0.5627	**
	Grant-in-Aid	219	15.67	2.62		

**= not significant at 0.05

Table 2.5 presents the comparative data for the "**Willingness to Change Opinions**" dimension of scientific temper among B.Ed. trainees from Government (N=74) and Grant-in-Aid (N=219) colleges. The results indicate that trainees from Grant-in-Aid institutions obtained a slightly higher mean score of **15.67** (SD = 2.62) compared to those from Government institutions, who recorded a mean of **15.46** (SD = 2.97). To assess the significance of this mean difference, a t-test was conducted, yielding a **t-value of 0.5627**, which was found to be **not significant at the 0.05 level**. This statistical outcome suggests that the type of college management does not significantly influence a trainee's inclination to revise their viewpoints in light of new evidence, indicating a comparable level of intellectual flexibility across both institutional categories.

Table 2.6: Showing the mean difference between B.Ed. trainees of Government and Grant-in-Aid colleges on 'Questioning Attitude' dimension of Scientific Temper

Dimension	Group	N	Mean	Std. Deviation	t-value	Level of Significance
Questioning Attitude	Government	74	17.57	2.36	0.9475	**
	Grant-in-Aid	219	17.55	2.16		

**= not significant at 0.05

Table 2.6 provides a comparative analysis of the "**Questioning Attitude**" dimension of scientific temper among B.Ed. trainees from Government and Grant-in-Aid institutions. The data reveals that trainees from Government colleges achieved a slightly higher mean score of **17.57** (SD = 2.36) compared to the mean score of **17.55** (SD = 2.16) recorded by trainees from Grant-in-Aid colleges. To determine if this variation was statistically meaningful, a t-test was applied, resulting in a **t-value of 0.9475**, which is **not significant at the 0.05 level**. These findings indicate that there is no substantial difference in the level of questioning attitude between the two groups, suggesting that both institutional environments are equally effective in fostering an inquisitive mindset among prospective teachers.

Table 2.7: Showing the mean difference between B.Ed. trainees of Government and Grant-in-Aid colleges on 'Objectivity' dimension of Scientific Temper

Dimension	Group	N	Mean	Std. Deviation	t-value	Level of Significance
Objectivity	Government	74	14.08	2.87	0.0204	**
	Grant-in-Aid	219	14.95	2.75		

**= not significant at 0.05

Table 2.7 illustrates the comparative analysis of the "**Objectivity**" dimension of scientific temper between B.Ed. trainees from Government and Grant-in-Aid institutions. The descriptive data shows that trainees from Grant-in-Aid colleges achieved a higher mean score of **14.95** (SD = 2.75) in comparison to the mean of **14.08** (SD = 2.87) recorded by those in Government colleges. To determine the statistical importance of this difference, a t-test was conducted, resulting in a **t-value of 0.0204**. This value was found to be **not significant at the 0.05 level**, indicating that the type of college management does not significantly impact the level of objectivity among prospective teachers.

Table 2.8: Showing the mean difference between B.Ed. trainees of Government and Grant-in-Aid colleges on 'Overall dimensions' of Scientific temper

Dimension	Group	N	Mean	Std. Deviation	t-value	Level of Significance
Scientific Temper	Government	74	110.95	13.14	0.2528	**
	Grant-in-Aid	219	112.94	12.88		

**= not significant at 0.05

Table 2.8 presents a comparative analysis of the overall Scientific Temper scores between B.Ed. trainees from Government (N=74) and Grant-in-Aid (N=219) colleges. The data indicates that Grant-in-Aid trainees achieved a slightly higher mean score of 112.94 (SD = 12.88) compared to the mean score of 110.95 (SD = 13.14) recorded by trainees from Government colleges. To determine the statistical significance of this variation, a t-test was conducted, yielding a t-value of 0.2528. The results confirm that there is no statistically significant difference in the overall scientific temper between the two groups, suggesting that the type of institutional management does not fundamentally impact this collective cognitive trait.

VII. DISCUSSION:

The analysis of the data indicates that B.Ed. trainees in Mysuru possess a high level of scientific temper, suggesting that teacher training programs are successfully fostering the rational and objective mindset essential for modern educators. The comparative analysis across the seven dimensions Critical Mindedness, Open-Mindedness, Respect for Evidence, Suspended Judgment, Willingness to Change Opinions, Questioning Attitude, and Objectivity demonstrates that the type of institutional management (Government vs. Grant-in-Aid) does not lead to statistically significant differences in these cognitive traits. While descriptive statistics showed minor variations in mean scores, the t-test results confirm that these differences are not statistically meaningful. This suggests that the foundational elements of scientific inquiry are being cultivated with consistent effectiveness across both types of colleges, implying that the curriculum and pedagogical environment rather than the administrative structure serve as the primary drivers for developing a scientific temperament in trainees.

VIII. IMPLICATIONS:

The findings have significant implications for educational policy and teacher training curriculum development. Given that there is no significant difference between trainees from Government and Grant-in-Aid colleges, it appears that the current pedagogical approaches in Mysuru are uniformly effective at embedding scientific values. Policy makers can take confidence in this consistency, knowing that the quality of scientific disposition in prospective teachers is not compromised by the institutional setting. Furthermore, since scientific temper is crucial for promoting inquiry-based learning in schools, these results encourage teacher educators to continue emphasizing these seven dimensions in their training modules. The study also suggests that future initiatives could focus on enhancing these traits even further, potentially by integrating more practical research-based projects or laboratory-based experiential learning to ensure that the "high" level of scientific temper observed is translated into proactive classroom practices.

IX. CONCLUSION:

In conclusion, the study provides a clear insight into the scientific temper of B.Ed. trainees in Mysuru, revealing that both Government and Grant-in-Aid students exhibit a strong scientific disposition. The empirical evidence gathered through the Scientific Temper Inventory confirms that the null hypothesis, which posited no significant difference between the two groups—must be accepted, as all statistical tests yielded non-significant results across the measured dimensions. Therefore, it is concluded that institutional management type does not act as a variable that alters a trainee's ability to think critically, question, or remain objective. The research successfully achieves its objectives by demonstrating that B.Ed. trainees, regardless of their college affiliation, are well-equipped with the rational cognitive tools necessary to navigate and contribute to a science-driven educational landscape.

X. DELIMITATION OF THE STUDY:

This study was subject to several delimitations designed to focus the scope of the research. Firstly, the sample was confined to 293 B.Ed. trainees from only three randomly selected colleges in Mysuru during the 2024-25 academic year, which may limit the ability to generalize these results to all B.Ed. colleges in the state or nation. Secondly, the investigation was limited to the use of Prof. K.S.

Misra's Scientific Temper Inventory; while this provided a standardized and valid framework, it relies on self-reported data, which might be influenced by individual biases or social desirability.

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