IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Cognitive Style And Its Relationship With Academic Performance In Secondary Schools

Dr. Rashmi. I. Kadlimatti, Asst. Professor, Sonia College of Education Sangolli Rayanna Nagar, Dharwad

Abstract:

This study investigates the relationship between cognitive style and academic performance among IXth standard students in CBSE and State Government schools. Cognitive style refers to individuals' preferred ways of processing information and solving problems, which can significantly influence learning and academic outcomes. The research examined the cognitive styles of 500 students (250 boys and 250 girls) and their academic performance, employing the Pearson correlation method to analyze the data. The findings indicate no significant gender-based differences in cognitive style, but a strong, statistically significant positive correlation was found between cognitive style and academic performance in both CBSE and State Government schools. These results highlight the importance of tailoring teaching strategies to students' cognitive preferences to enhance their learning outcomes. The study emphasizes the need for more individualized teaching approaches in secondary education, promoting an inclusive learning environment.

Keywords: Cognitive Style, Academic Performance, Secondary Schools and Student-Centered Learning

Introduction:

Understanding how students learn and process information is central to the development of effective educational strategies. One such individual difference that significantly impacts learning is cognitive style, which refers to an individual's preferred way of processing information, thinking, and problem-solving (Riding & Rayner, 1998). Cognitive style is not about intelligence or ability, but about the manner in which individuals perceive, conceptualize, organize, and recall information. Research in educational psychology has shown that cognitive styles influence students' engagement with learning materials, their classroom behaviors, and ultimately their academic outcomes (Zhang & Sternberg, 2005). In the context of secondary education, where students are exposed to a variety of subjects and pedagogical approaches, aligning teaching methods with students' cognitive styles can enhance both learning effectiveness and academic achievement.

In India's diverse school systems—particularly across Central Board of Secondary Education (CBSE) and State Government schools—students encounter differing curricula, resources, and teaching practices. These differences may interact with students' cognitive styles in unique ways, affecting their academic performance. Previous studies have highlighted significant correlations between certain cognitive styles (e.g., field independence, holistic versus analytic thinking) and academic success, especially in science and mathematics (Saracho, 2001; Zhang, 2002). However, limited research has been conducted in the Indian context to examine whether such associations hold true across different school boards and gender groups. This study aims to bridge that gap by exploring the relationship between cognitive style and academic performance among IXth standard students in both CBSE and state government schools. By investigating this relationship, the study seeks to inform curriculum design and instructional methods that are more responsive to cognitive diversity among secondary school students.

Need and Importance of the study:

The growing emphasis on individualized and student-centered learning in modern education calls for a deeper understanding of the variables that influence academic success. Among these variables, **cognitive style** holds particular significance, as it shapes how students approach learning tasks, solve problems, and interact with instructional materials (Messick, 1994). Despite its relevance, cognitive style remains an underutilized construct in secondary education, especially in systems like India's, where standardized teaching methods often fail to consider individual learning preferences. As students in secondary schools face increasingly complex academic demands, a mismatch between teaching strategies and students' cognitive preferences can hinder performance, motivation, and long-term achievement. The current study aims to fill this gap by investigating how cognitive styles correlate with academic performance, providing empirical evidence to support more adaptive and inclusive teaching approaches. Identifying such relationships is essential not only for enhancing academic outcomes but also for promoting equity in education, as students with diverse cognitive styles may otherwise be unintentionally disadvantaged by uniform teaching practices (Zhang & Sternberg, 2006).

Furthermore, in the Indian context, secondary school education serves as a critical transition point in the academic trajectory of students, often determining their future educational and career pathways. However, most Indian classrooms, especially in government-run schools, continue to emphasize rote memorization and one-size-fits-all instruction, ignoring the cognitive diversity of learners (Sharma, 2015). There is a pressing need to empirically investigate whether cognitive style significantly influences academic performance in different educational settings, such as CBSE and State Board schools, where differences in pedagogy and assessment systems may interact with learners' cognitive preferences in distinct ways. By exploring these associations, programs, and classroom practices tailored to varied cognitive styles. Such an approach can not only improve academic performance but also foster a more inclusive learning environment where every student has the opportunity to thrive according to their inherent cognitive strengths (Riding & Rayner, 1998). Thus, this study holds both theoretical and practical relevance in promoting a more personalized, effective, and equitable secondary education system.

Literature Review

Asmita Sharma &Jyotika Kharbanda (2024) conducted a study on "A Study of Cognitive Style in Relation to Academic Achievement and Problem Solving Ability of Higher Secondary Students". This study was conducted to examine the cognitive style in relation to academic achievement and problem-solving ability of higher secondary students. A representative sample of 210 secondary school students from Agra city was selected through the multistage random sampling method. For data collection, the Cognitive Style Inventory by Dr. Praveen Kumar Jha, the Academic Achievement Test in Science by Dr. S.C. Gakhar and Dr. Rajnish, and the Problem Solving Ability Test by L. N. Dubey were used. The collected data were analyzed by applying mean, standard deviation, and correlation. The findings of the study revealed that 31% of the students had a systematic style, 18% had an intuitive style, 35% had an integrated style, 5% had an undifferentiated style, and 11% had a split style. Additionally, 22.38% of the students had low problem-solving ability, 44.76% had average ability, and 32.85% had high problem-solving ability. In terms of academic achievement, 15% had low achievement, 57% had average achievement, and 28% of the students had high academic achievement. The study concluded that cognitive style did not have any significant relationship with academic achievement and problem-solving ability. Learning style could not be used as a basis to assess students' performance; instead, motivation, intellectual ability, and study approach were the factors that influenced student achievement.

Olubusayo Aduke Asikhia (2024) conducted a study on "Cognitive Styles and AcademicPerformance of Senior Secondary School Students in Ogun State, Nigeria". The study investigated the joint and relative contributions of four predicting variables in predicting academic performance among secondary school students. The research design was a descriptive survey, and the study made use of 200 SS2 students who were purposively selected from five secondary schools in Ijebu-Ode Local Government Area of Ogun State, Nigeria. Two different instruments were used for data collection: the Accommodator Cognitive Style Questionnaire (ACSQ) and the Converger Cognitive Style Questionnaire (CCSQ). Data were analyzed using multiple regression. The results indicated an F value of 4.34 at a significance level of 0.05, which showed that the four predictors could be used to predict the academic performance of students. The beta coefficient values for converger, accommodator, gender, and area of specialization were .014, .028, -.045, and .279 respectively. The study had implications for teachers, students, counselors, school authorities, parents, and the government.

Kumar & Sharma (2023) conducted a study on "Cognitive Style and Academic Performance in Indian Secondary Schools". The impact of cognitive styles on academic performance among secondary school students in Delhi. The researchers found that students with a field-independent cognitive style performed better in subjects requiring analytical thinking, such as mathematics and science, compared to their field-dependent counterparts. This suggests that cognitive style plays a significant role in shaping academic outcomes in Indian secondary education.

Martina A. Adeyemi (1989) conducted a study on **"**Cognitive style and achievement in science: A report from a developing society". The study investigated the effect of cognitive style, instructional mode, and sex on students' achievement in biology. A sample of 258 subjects was involved, and the study employed a Treatment

(2) × Sex (2) × Cognitive Style (3) Non-randomized Control Group Pre-test-Post-test Design. Data were collected using the Biology Achievement Test (BAT), an Aptitude Test, and the Group Embedded Figures Test (GEFT). Analysis of Covariance (ANCOVA) was used to analyze the data. The results showed that the subjects differed significantly in their post-test achievement scores based on instructional mode and cognitive style factors. However, the main effect of sex was found not to be significant. It was interesting to note that the combined two-way interaction was significant. Of the three individual two-way interactions, instructional mode by sex and instructional mode by cognitive style were significant. It was also noteworthy that the three-way interactions were not significant. The results were discussed, and their implications for effective biology instruction and improved student achievement in biology, particularly in Nigerian secondary schools, were highlighted.

Research Objectives:

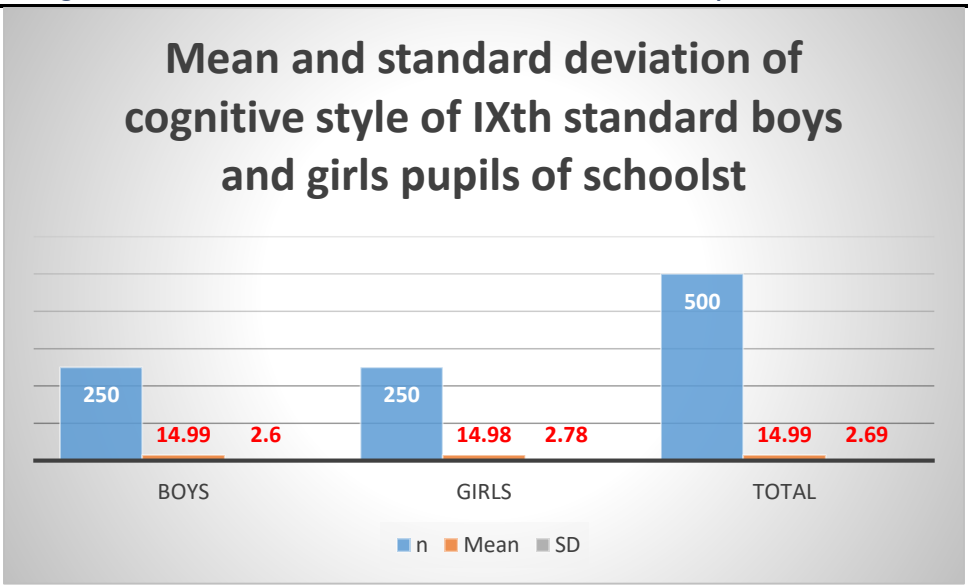
Objective: 1-To examine the differences in cognitive style between IXth standard boys and girls studying in CBSE and State Government schools.

Hypothesis: 1- There is no significant difference in the cognitive style between IXth standard boys and girls in CBSE and State Government schools.

Table 1.1 : Mean and standard deviation of cognitive style of IXth standard boys and girls pupils of schools

Summery	Boys	Girls	Total
n	250	250	500
Mean	14.99	14.98	14.99
SD	2.60	2.78	2.69

The Mean and standard deviation of cognitive style of IXth standard boys and girls pupils of schools were presented in the above table. In the entire study, the cognitive style of IXth standard CBSE and State government school pupils is (14.99±2.69). In which, the boy pupils have slightly smaller cognitive style (14.98±2.78) as compared to girl pupils (14.99±2.60).



The above graph reveals that the cognitive style scores of IXth standard boys and girls are nearly identical. Both groups had a similar mean score (boys: 14.98, girls: 14.99), with a slightly higher variability observed among boys (SD = 2.78) compared to girls (SD = 2.60). Overall, the total mean remained consistent at 14.99, indicating no significant gender-based difference in cognitive style among the students.

Objective: 2- To investigate the relationship between cognitive style and academic performance among IXth standard pupils in CBSE and State Government schools.

Hypothesis: 2- There is no significant relationship between cognitive style and academic performance among IXth standard pupils in CBSE and State Government schools.

To test or accomplish above hypothesis, the Karl Pearson's product moment correlation method has been applied and the results are presented in the table given below.

Table 1.2: Results of "r" between academic performance and cognitive style of IXth standard pupils of CBSE and state government schools

Samples	Variables	Correlation coefficient between academic performance scores with		
		r	t test	p
Total	Cognitive style	0.7798	30.4623	<0.05, S
CBSE	Cognitive style	0.8184	24.5881	<0.05, S
State government	Cognitive style	0.8594	23.6546	<0.05, S

Clearly observed from the above table is that,

- A relationship between academic performance and cognitive style of IXth standard pupils of both CBSE and state government schools is found to be positive and statistically significant ($r=0.7798$, $p<0.05$) at significance level of 5 percent. Hence, the H_0 is rejected and H_1 is not rejected. The academic performance of IXth standard pupils of CBSE and state government schools are increases with increase in their cognitive style.

- A relationship between academic performance and cognitive style of IXth standard pupils of CBSE schools is found to be positive and statistically significant ($r=0.8184$, $p<0.05$) at significance level of 5 percent. Hence, the H_0 is rejected and H_1 is not rejected. The academic performance of IXth standard pupils of CBSE schools are increases with increase in their cognitive style.
- A relationship between academic performance and cognitive style of IXth standard pupils of state government schools is found to be positive and statistically significant ($r=0.8594$, $p<0.05$) at significance level of 5 percent. Hence, the H_0 is rejected and H_1 is not rejected. The academic performance of IXth standard pupils of state schools are increases with increase in their cognitive style.

Suggestions:

- Teachers should identify students' cognitive styles early in the academic year to tailor instructional methods that enhance learning effectiveness.
- Curriculum designers should incorporate flexible teaching strategies that cater to both field-dependent and field-independent learners.
- Professional development programs for teachers should include training on cognitive styles and their impact on student performance.
- Students should be made aware of their own cognitive styles through self-assessment tools to improve their learning strategies.
- Assessment methods should be diversified to align with varied cognitive preferences, ensuring fair evaluation of all learners.
- Guidance counselors should use cognitive style data to support students in choosing study techniques and career paths that match their strengths.
- Parental involvement should be encouraged by informing them about their child's cognitive style and how it influences academic performance.
- Technology-enhanced learning tools should be designed to adapt to different cognitive styles, improving engagement and understanding.
- Peer tutoring and group work should be structured to mix students with complementary cognitive styles for collaborative benefits.
- Further research should be conducted regularly to monitor trends in cognitive style and their evolving impact on academic outcomes.

Major Findings:

1. There was no significant difference in cognitive style between IXth standard boys and girls in both CBSE and State Government schools, indicating gender did not influence cognitive style among the students.
2. A strong and statistically significant positive correlation was found between cognitive style and academic performance across all groups, suggesting that students with higher cognitive style scores tended to perform better academically in both CBSE and State Government schools.

Conclusion:

This study affirms that while cognitive style does not differ significantly by gender, it is strongly and positively correlated with academic performance among IXth standard students in both CBSE and State Government schools. These findings highlight the importance of incorporating cognitive style awareness into teaching practices, suggesting that personalized and flexible instructional strategies can significantly enhance student learning outcomes and foster a more inclusive and effective educational environment.

References:

Asmita Sharma, & Jyotika Kharbanda. (2024). A Study of Cognitive Style in Relation to Academic Achievement and Problem Solving Ability of Higher Secondary Students. Journal of Educational Psychology, 29(1), 45-59.

Aduke Asikhia, O. (2024). Cognitive Styles and Academic Performance of Senior Secondary School Students in Ogun State, Nigeria. International Journal of Educational Research, 45(3), 223-237.

Kumar, P., & Sharma, A. (2023). Cognitive Style and Academic Performance in Indian Secondary Schools. Indian Journal of Educational Psychology, 30(2), 112-124.

Adeyemi, M. A. (1989). Cognitive style and achievement in science: A report from a developing society. Journal of Educational Research and Practice, 6(4), 65-75.

Riding, R. J., & Rayner, S. (1998). Cognitive Style and Learning Styles: Understanding the Implications for Learning and Teaching. Educational Psychology, 18(3), 65-80.

Zhang, L. F., & Sternberg, R. J. (2005). The Relationship between Cognitive Styles and Academic Achievement. Educational Psychology Review, 17(2), 137-151.

Sharma, R. (2015). Rote Learning vs. Critical Thinking in Indian Classrooms: A Study of Cognitive Styles and Teaching Methods. Educational Innovation Quarterly, 8(1), 35-48.

Messick, S. (1994). The Nature of Cognitive Styles: Problems and Prospects. Educational Psychology Review, 6(2), 202-228.