ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25oct681

Correlation Between Secondary School Learners' Cognitive Style and their Attainment in English

Cognitive Style and Student Achievement

P. Pavithra[1]; A. Jahitha Begum[2]; M. Santhamani[3]; P. Ponnusamy[4*]

[1,2,3,4] Department of Education, The Gandhigram Rural Institute (Deemed to be University), Dindigul, Tamil Nadu

Corresponding Author: Dr. P. Ponnusamy*
Assistant Professor, Department of Education, The Gandhigram Rural Institute (Deemed to be University), Dindigul -6240302, Tamil Nadu

Publication Date: 2025/11/25

Abstract: The study investigates how cognitive style relates to students' learning performance in English at the secondary school level. A person's unique way of thinking, seeing, and processing information that affects how they learn and solve problems is referred to as their cognitive style. The research further investigates how gender and locality impact learning achievement and cognitive styles. Employing a survey method, data were collected from 160 ninth-standard students (80 boys and 80 girls; 40 rural and 40 urban in boys and girls respectively) from government schools in Coimbatore District, Tamil Nadu. Standardized instruments - the Student Achievement Test in English and a Cognitive Style Questionnaire - were used. An analysis of the data using mean, standard deviation, t-test, and correlation revealed that students were average achievers in English (M = 16.11, SD = 3.79). Urban students performed significantly better than rural students ($p < 0.05$), while gender differences were insignificant. Learning achievement and cognitive style showed a moderately positive correlation (r = 0.37), emphasizing that cognitive flexibility in enhancing learning outcomes.

Keywords: *Cognitive Style, Learning Achievement, English Learning, Secondary School Students, Gender, Locality.*

How to Cite: P. Pavithra; A. Jahitha Begum; M. Santhamani; P. Ponnusamy (2025) Correlation Between Secondary School Learners' Cognitive Style and their Attainment in English. *International Journal of Innovative Science and Research Technology*, 10(10), 3349-3353. https://doi.org/10.38124/ijisrt/25oct681

I. INTRODUCTION

Cognitive style or "thinking style," represents a key aspect in cognitive psychology that encompasses the distinctive approaches individuals use to think, perceive, and process information (Belousova, 2014). It is distinct from cognitive ability or intelligence, which is typically assessed through aptitude or intelligence tests. Messick (1996) observes that cognitive style remains an important construct in education and management, even though debates regarding its exact definition and whether it should be viewed as a single or multidimensional aspect of human personality.

Cognitive style represents a self-generated and situationally influenced control process through which learners consciously organize, regulate, receive, and transmit information, ultimately shaping their behaviour and learning outcomes (Ellah and Achor, 2015). Research demonstrates that individuals exhibit diverse approaches to learning and problem-solving tasks (Babalola, 1989; Onwu & Asuzu, 1989). Such differences result from varied cognitive information-processing strategies and has a substantial impact on students' learning success. Thornel (1994) emphasized that science education must take into account learners' cognitive styles and learning performance as essential criteria in the formulation and implementation of curricula and instructional practices.

Furthermore, when a student's cognitive style aligns with the teacher's instructional approach, it enhances the potential

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25oct681

for a more effective and positive learning experience (Sellah et al. 2017). Similarly, in collaborative settings, team members with compatible cognitive styles often experience greater satisfaction and cohesion. However, while such compatibility can enhance comfort and communication, it does not alone guarantee successful learning outcomes or team performance (Chen, 2011).

II. NEED OF THE STUDY

Educational theorists assert that knowledge is constructed through active interaction with the real world, enabling individuals to accumulate and build upon personal experiences. From a constructivist perspective, meaningful learning is closely linked to the context in which learners are situated (Billett, 1996). Within authentic contexts, learners are able to apply theories and concepts independently, engaging in hands-on experiences that foster deeper understanding. Learning by doing not only allows learners to reflect on prior knowledge but also enhances their problem-solving skills when encountering similar situations in the future (Hmelo-Silver, 2004). Although classroom simulations can partially replicate real-life experiences, learning outcomes are generally more effective when activities occur within genuine, real-world environments (Lunce, 2006).

Despite this, a noticeable gap often exists between individuals' thinking and performance due to rapid advancements across various fields of life. Learning styles and environments vary depending on external factors such as people, materials, and instructional strategies (Parra, 2016). Preferences in cognition, thinking, and memory processes directly or indirectly shape an individual's behaviour and learning activities.

Cognitive styles, therefore, are patterns of mental behaviour habitually employed when solving problems. They influence how individuals perceive, process, and utilize information from their surroundings, ultimately determining the effectiveness of their learning and performance (Kozhevnikov, 2007). With this background, a study was undertaken by the authors under the title of 'Correlation between Secondary School Learners' Cognitive Style and their Attainment in English.'

III. LITERATURE REVIEWS

Cognitive style is treated in the literature as a relatively stable individual difference that shapes how learners perceive, process and organize information; many studies examine its relation to achievement in school subjects, including English language learning (Jonassen, and Grabowski, 2012). Several reviews point out that the effect of cognitive style on achievement is often moderated by task type, assessment format and instructional context.

Backhaus and Liff (2007) explored how intuition-based and analysis-based cognitive styles, along with study approaches, influenced learning outcomes among 222 business students. The results demonstrated a positive association between students' analytical orientation and their learning performance as measured by grade point averages. Additionally, higher learning performance was correlated with elevated scores in Metacognitive Awareness, Deep and Strategic learning approaches, and Learning Self-Confidence.

Gender differences were also observed, with female students displaying a stronger analytic cognitive style and scoring higher on both the Surface and Strategic approaches.

Khodadady and Zeynali (2012) conducted a study with use of 200 English learners and administered them GEFT and IELTS listening test. The key finding of study revealed that the field-independence was associated with stronger performance on some listening comprehension tasks (local/detail questions), though effects varied by item type.

Wulandari et al. (2016) looked into how Indonesian university students' learning achievement was impacted by their cognitive style and creative qualities. Their findings indicated that students employing analytical thinking inclined to achieve greater learning success, particularly in life science subjects. Furthermore, the study indicated that students must actively harness and apply their creative potential to achieve higher levels of learning success in challenging courses. .

A study by Olagbaju (2020) aimed to ascertain whether gender and cognitive style could forecast the degree of performance of students' in summary writing assignments. This peer-reviewed study found that cognitive style significantly predicted writing performance, showing that thinking style contributes to variance in English achievement alongside gender. A study of higher-secondary students (India) that related cognitive style with learning achievement and problem-solving ability was conducted by Sharma and Kharbanda (2024) and their findings reported significant associations between cognitive style classifications and learning outcomes, including language-related performance.

IV. METHODS AND MATERIALS

The Survey research method was used in the present investigation. A total of 160 Ninth Standard students from Government Schools in the Coimbatore district of Tamil Nadu, India, were randomly selected for the study. Among them, 80 were boy and 80 were girl students and out of the 80 in each there were 40 rural and 40 urban students. The authors prepared Student Achievement Test in class IX English subject and Student Cognitive Style Questionnaire as the research tools of the study following the proper tool standardization procedures and then were administered to the selected sample for collecting the needed data.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25oct681

The achievement test consisted with 26 multiple choice question and each right responses of sample carries a score one (1). Hence the maximum score for this is 26 and a minimum score is 0. Hence, one who secures a score above 20 indicates high achievement in Science, 13 to 20 indicate average level of achievement in Science and a score below 13 indicates low level of achievement Science. The reliability test was conducted for the students' achievement tests by using the 'Test -Retest' method. The correlation coefficient of the odd and even groups' score is 0.75.

Student Cognitive Style Questionnaire is another tool used in the study which has 10 statements with Yes or No responses. The first five statements of tool represent the analysis cognitive style and the remaining statements represent the intuition cognitive style. For the each positive response, the score is allotted one (1). Therefore the maximum score for this tool is 10.

The research tools prepared by the investigator were distributed to a sample group consisting of 5 teacher educators and 5 high school teachers handling English subject.

V. RESULTS

A. Learning Achievement Scores of Sample

In order to find out the selected secondary school students' achievement levels in English, an analysis of their scores was carried out using mean and standard deviation values. The results indicate that the mean score of 16.11 with a corresponding standard deviation (S.D) score of 3.79. The mean value (16.11) indicates that the selected students were average achievers in English. Table 1 below presents the mean scores and standard deviations (SDs) of students' English achievement test performance, categorized by gender and locality.

Table – 1: Comparison of Mean Scores of Secondary Students in English Achievement Test

Achievement Score	N	M	SD	t	p
Male	*80*	*15.61*	*4.15*	*1.67*	*0.09*
Female	*80*	*16.63*	*3.35*		
Rural	*80*	*13.76*	*2.60*	*9.93*	*0.00*
Urban	*80*	*18.45*	*3.33*		

The above table-1 data indicates that even though female students achieved a higher mean score than male students, no significant difference exists at the 0.05 significance level, as the p-value of 0.09 exceeds 0.05. Further when comparing the mean scores between rural and urban students reveals a significant difference at 0.05 significant level, as evidenced by a p-value of less than 0.000. The following table-2 shows the combined influence of gender and locality on students' English achievement test.

Table – 2: Comparison of Mean Scores of Gender x Locality wise Students in English Achievement Test

Achievement Score		N	M	SD	t	p
Male	Rural	*40*	*13.40*	*3.19*	*5.56*	*0.00*
	Urban	*40*	*17.84*	*3.86*		
Female	Rural	*40*	*14.11*	*1.81*	*10.03*	*0.00*
	Urban	*40*	*19.12*	*2.58*		

The above table-2 data indicates the combined influence of gender and locality on students' English achievement test. Male rural and urban students' mean scores were compared, and it was discovered that the urban students scored higher (M = 17.8, SD = 3.86) than the rural students (M = 13.4, SD = 3.19). Their corresponding t (=5.56) and p (=0.00 < 0.05) show that the English achievement levels of these female students from rural and urban areas differed significantly.

Further, when comparing the mean scores of female-rural and urban students, it is found that the urban students (M = 19.1, SD = 2.58) scored higher than the rural students (M = 14.1, SD = 1.81). Their corresponding t (=10.03) and p (=0.00 < 0.05) indicate that there was also a significant difference between the achievement levels of these rural and urban female students in English.

B. Cognitive Style Scores of Sample

In order to find out the selected secondary school students' cognitive styles levels, the score distribution from the Cognitive Style Questionnaire was analysed using mean and standard deviation values. The data results on cognitive styles indicate that the mean and standard deviation (S.D) scores of students are 5.406 and 1.583 respectively in total cognitive style questionnaire. The mean score of the sample is between the score 4 and 6 and therefore the selected samples were having average cognitive style. Further, the mean and SD of Analysis Cognitive Style were 2.963 and 0.903 and similarly, the mean and SD in Intuition Cognitive Style were 2.444 and 0.750. So these data indicates that the selected sample prefers mostly Analysis Cognitive Style.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25oct681

Table 3 below presents the gender-wise students' mean scores and standard deviations (SDs) in cognitive style questionnaire.

Table–3: Comparison of Mean Scores of Secondary Students in Cognitive Style Questionnaire - Gender Wise

Gender X Cognitive Styles		N	M	SD	t	p
In Total	Male	*80*	*5.46*	*1.84*	*0.45*	*0.65*
	Female	*80*	*5.35*	*1.28*		
Analysis	Male	*80*	*2.95*	*1.07*	*0.17*	*0.86*
	Female	*80*	*2.98*	*0.71*		
Intuition	Male	*80*	*2.51*	*0.83*	*1.16*	*0.25*
	Female	*80*	*2.38*	*0.66*		

The above table 3 indicates that mean scores of male and female students in total cognitive style and analysis and intuition cognitive style are more or less equal and their corresponding t- values are not large enough to reach statistical significance at $p < 0.05$. Therefore, gender does not have a significant influence on any of the three cognitive styles among the sample. The below table 4 shows the locality wise students' mean scores and standard deviations (SDs) in cognitive style questionnaire.

Table–4: Comparison of Mean Scores of Secondary Students in Cognitive Style Questionnaire - Locality wise

Gender X Cognitive Styles		N	M	SD	t	p
In Total	Rural	*80*	5.68	1.34	*2.18*	*0.03*
	Urban	*80*	5.14	1.76		
Analysis	Rural	*80*	3.13	0.80	*2.31*	*0.02*
	Urban	*80*	2.80	0.97		
Intuition	Rural	*80*	2.55	0.61	*1.80*	*0.07*
	Urban	*80*	2.34	0.86		

From the above table-4 data, the comparison of mean scores indicates that the rural students (M = 5.68, SD = 1.34) demonstrated higher level of cognitive style than the urban students (M = 5.14, SD = 1.76). Their corresponding t (=2.18) and p (=0.03 < 0.05) indicate a significant difference in the cognitive styles between rural and urban students.

The comparison of the mean scores of rural and urban students in their analysis-cognitive styles shows that the rural students (M = 3.13, SD = 0.80) scored higher than the urban students (M = 2.80, SD = 0.97). Their corresponding t (=2.31) and p (=0.02 < 0.05) indicate a significant difference in analysis-cognitive styles between rural and urban students.

The comparison of the mean scores of rural and urban students in their intuition-cognitive styles shows that the rural students (M = 2.55, SD = 0.61) scored higher than the urban students (M = 2.34, SD = 0.86). But their corresponding t (=1.80) and p (=0.07 > 0.05) indicate that there was no significant difference in the intuition-cognitive styles between rural and urban students.

C. Correlation Between the Students' Achievement and Cognitive Style

The correlation analysis between the students' achievement in English and cognitive style scores was found and result indicates the correlation coefficient values as 0.37. This indicates that a positive moderate relationship between the students' cognitive style and their learning achievement. That is, as the students' cognitive style becomes more adaptable, their learning achievement tends to increase moderately.

VI. CONCLUSION

The results of the study demonstrate that students are average achievers in English and exhibit average cognitive style tendencies. Gender does not significantly influence either achievement or cognitive style. Locality plays a crucial role, with urban students showing higher achievement and rural students showing stronger analytical cognitive styles. Students' cognitive style positively correlates with their learning performance in English, suggesting that cognitive adaptability contributes meaningfully to better learning outcomes. Overall, the findings highlight the importance of enhancing cognitive skill development and providing equitable learning environments across localities to improve English achievement among secondary school students.

REFERENCES

[1]. Backhaus, K., & Liff, J. P. (2007). Cognitive styles and approaches to studying in management education. *Journal of Management Education, 31*(4), 445-466.

[2]. Belousova, A. (2014). Thinking style as a factor of variable cognitive education. *Procedia-Social and Behavioral Sciences, 149*, 97-101.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25oct681

[3]. Billett, S. (1996). Situated learning: Bridging sociocultural and cognitive theorising. *Learning and Instruction*, *6*(3), 263-280.
[4]. Chen, J. L. (2011). The effects of education compatibility and technological expectancy on e-learning acceptance. *Computers & Education*, *57*(2), 1501-1511.
[5]. Ellah PhD, B. O., & Achor, E. E. (2015). Cognitive Styles and Attitude to Science of Senior Secondary School Science Students of High Cognitive Ability Level. *International Centre for Science, Humanities and Education Research Journal (ICSHER Journal)*, *1*(3), 10-26.
[6]. Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn?. *Educational psychology review*, *16*(3), 235-266.
[7]. Jonassen, D. H., & Grabowski, B. L. (2012). *Handbook of individual differences, learning, and instruction*. Routledge.
[8]. Khodadady, E., & Zeynali, S. (2012). Field-dependence/independence cognitive style and performance on the IELTS listening comprehension. *International Journal of Linguistics*, *4*(3), 622-635.
[9]. Kozhevnikov, M. (2007). Cognitive styles in the context of modern psychology: toward an integrated framework of cognitive style. *Psychological bulletin*, *133*(3), 464.
[10]. Lunce, L. M. (2006). Simulations: Bringing the benefits of situated learning to the traditional classroom. *Journal of Applied Educational Technology*, *3*(1), 37-45.
[11]. Messick, S. (1996). Bridging cognition and personality in education: The role of style in performance and development. *European journal of Personality*, *10*(5), 353-376.
[12]. Olagbaju, O. O. (2020). Cognitive styles and gender as predictors of students' achievement in summary writing in selected secondary schools in Ibadan, Nigeria. *Education Research International*, *2020*(1), 8462368.
[13]. Parra, B. J. (2016). Learning strategies and styles as a basis for building personal learning environments. *International Journal of Educational Technology in Higher Education*, *13*(1), 4.
[14]. Sellah, L., Jacinta, K., & Helen, M. (2017). Analysis of Student-Teacher Cognitive Styles Interaction: An Approach to Understanding Learner Performance. *Journal of Education and Practice*, *8*(14), 10-20.
[15]. Sharma, A., & Kharbanda, J. (2024). A Study of Cognitive Style in Relation to Academic Achievement and Problem Solving Ability of Higher Secondary Students. *International Journal of Indian Psychology*, *12*(3).
[16]. Wulandari, N. H., Widayati, K. A., & Suryobroto, B. (2016). Cognitive style and creative quality: Influence on academic achievement of university students in Indonesia. *HAYATI Journal of Biosciences*, *23*(3), 121-124.