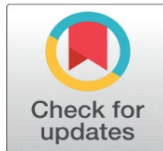
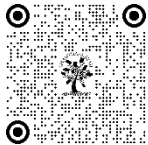


# CONCEPT ACQUISITION IN SOCIAL STUDIES AMONG SECONDARY SCHOOL STUDENTS IN RELATION TO COGNITIVE ABILITY AND LOCALITY OF SCHOOL

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## ABSTRACT

This paper investigates the impact of cognitive ability and locality of school on concept acquisition in social studies among secondary school students in Ludhiana district. Using stratified random sampling, 200 students were assessed through a cognitive ability test and a concept acquisition test. Analysis with the 't' test, F-ratio, and ANOVA revealed significant differences in concept acquisition scores based on cognitive ability levels and school locality. Students with higher cognitive ability and those from rural schools scored higher. The study highlights the positive association between cognitive ability and concept acquisition, recommending activities like reasoning classes and quiz competitions to enhance cognitive skills in schools.

## 1. INTRODUCTION

Education plays a crucial role in cognitive development by providing structured learning experiences that enhance critical thinking, problem-solving, and memory skills. Through diverse teaching methods and curricula, education fosters the growth of cognitive abilities necessary for academic and life success. NEP 2020 emphasizes developing cognitive abilities, advocating for reforms that promote critical thinking, creativity, and problem-solving. The policy focuses on foundational skills, technology integration, and teacher training to support cognitive growth.

Concept acquisition, the process of understanding abstract ideas, is vital to human cognition. It helps individuals make sense of experiences, organize knowledge, and navigate the world. Bengston and Cohen (1979) analyzed concept acquisition, suggesting that categorization emerges from perceiving an entity's significance. Bourne and Dominowski (1972) viewed categorization as a facet of perception to avoid information overload. Miller, Galanter, and Pribram (1960)

proposed a hierarchical organization of behaviour in cognitive representations. Bruner et al. (1956) emphasized that categorizing behaviour reduces environmental complexity and facilitates learning and prediction of outcomes.

In social studies, concept acquisition involves perceiving and categorizing information to understand social phenomena. Theories by Nelson (1974), Gibson (1966), and Bruner (1956) highlight the importance of direct perception and meaningful categorization. Educators can enhance conceptual understanding by integrating real-world experiences, emphasizing contextual learning, encouraging categorization, and utilizing technology.

Cognitive ability encompasses the mental processes associated with acquiring, understanding, retaining, and using information (Robinson, 2012). Blair (2006) highlighted the importance of refining neurobiological assessments for understanding early cognitive development. Cognitive abilities include perception, attention, memory, reasoning, problem-solving, and decision-making (Flavell, 1999). These abilities are shaped by genetics, environment, education, and experiences. Assessments are used to measure cognitive ability, which significantly impacts educational outcomes (Marks, 2013).

Rural and urban schools differ significantly in various aspects. Rural schools often face challenges such as limited access to resources, fewer extracurricular activities, and a smaller student population, which can affect the diversity of programs offered. In contrast, urban schools typically have more access to resources, advanced technology, and a wider variety of programs due to larger budgets and a higher student population. However, urban schools can also face issues like overcrowding and higher rates of student diversity, which require more comprehensive support systems. Chand and Mohan (2019) studied Rural and remote schools often encounter distinct challenges compared to urban schools, such as issues related to geography, poverty, and funding, which impact the quality of education. Providing strong leadership and sufficient resources is crucial to moving beyond traditional teaching methods and boosting student engagement and participation in the classroom.

The purpose of this paper is to investigate the impact of cognitive ability and school locality on concept acquisition in social studies among secondary school students. It aims to explore how cognitive abilities and diverse school locality influence students' understanding of the concepts related to the subject of social studies.

## 2. REVIEW OF RELATED LITERATURE

The literature reviewed indicated that cognitive ability affects the academic achievement of learners. Rohde and Thompson (2007) explained that after accounting for general cognitive ability, none of the specific cognitive skills contributed additional variance to academic achievement. Hames and Baker (2015) indicated that differences in performance on cognitive tasks between gender groups (male and female) were more notable than differences between learning styles groups. Phillipson and Phillipson (2012), Padmini (2017), Alves, Gomes, Martins and Almeidaa (2017), Melhuish (2010), Mehar and Lehal (2018), and Gupta and Lakhani (2018), Tikhomirova, Malykh and Malykh (2020) discovered that individuals with high cognitive ability had significantly higher achievement levels compared to those with average or low cognitive abilities. Yuliati, Maridi, and Masykuri (2018) demonstrated that students taught using the Concept Attainment Model achieved higher cognitive learning outcomes compared to those taught through discovery learning. Shi and Qu (2021) found that cognitive abilities significantly and positively influence overall academic performance. Yusop, Samsuddin, Derus, and Rahim (2022) reported no significant differences in Spatial Visualisation Ability Test (SVAT) scores and Construction Quantification Test (CQT) scores across different genders and ages. Saha, Pandey, Sharma and Kumar (2023) found that there was significant difference among the 13th, 14th and 15th years old in mean score of memory. There were significant differences between males and females in the average scores for awareness, memory, and understanding.

Singh and Singh (2007) discovered that the location significantly influences mathematics achievement among adolescents. Akinyele (2011) stated that a child's immediate environment greatly impacts their socialization. He believed that the location of a school can affects a student's academic performance. Owuoye and Yara (2011) identified a significant difference in academic achievement between students from rural and urban secondary schools in their senior school certificate examinations. Osokoya and Akuche (2012) indicated that school location significantly influenced students' cognitive attainment and practical skills performance, though it had no significant effect on attitude. Physics teachers are encouraged to actively support students in less urbanized schools. Educational stakeholders should ensure that rural schools have access to the same infrastructure, equipment, materials, and resources as urban schools. Agbaje and Awodun (2014) found no statistically significant difference in achievement mean scores between male and female

students in both rural and urban school areas. However, they did find a significant difference in achievement mean scores between students in rural and urban school locations. Alordiah, Akpadaka, and Oviogbodu (2015) reported that male students performed better than female students, urban students outperformed rural students, and students with parents of high socioeconomic status (SES) outperformed those with parents of low SES. They recommended that teachers take into account these disparities when teaching mathematics. Hooda and Devi (2017) discovered a notable impact of locality on mathematics achievement among secondary school students. Essien (2017) suggested urgent action from the government and relevant stakeholders to bridge the gap in infrastructure between rural and urban areas. This includes ensuring well-equipped schools, sufficient qualified staff, and standard facilities to promote consistent academic achievement in Social Studies, regardless of school location. Awodun and Oyeniyi (2018) identified a significant difference in mean achievement scores between students in urban and rural areas. Abamba (2021) demonstrated no significant difference in achievement between rural and urban students when taught using the 5E learning circle method. Unugo (2023) revealed a similar finding, showing no significant difference in mean achievement scores between urban and rural Social Studies students in Abakaliki Education of Ebonyi State.

### 3. STATEMENT OF THE PROBLEM

Concept Acquisition in Social Studies Among Secondary School Students in Relation to Cognitive Ability and Locality of School

#### 3.1. OBJECTIVES OF THE STUDY

- To compare concept acquisition of secondary school students with respect to high, average and low cognitive ability.
- To compare concept acquisition of secondary school students with respect to locality of school.
- To study concept acquisition of secondary school students with respect to cognitive ability and locality of school.

#### 3.2. HYPOTHESES OF THE STUDY

- 1) There is no significant difference in concept acquisition of secondary school students with respect to cognitive ability.
- 2) There is no significant difference in concept acquisition of secondary school students of rural and urban schools.
- 3) There is no significant difference in concept acquisition of secondary school students with respect to cognitive ability and locality of school.

### 4. RESEARCH DESIGN

The present study falls under the domain of descriptive research. For the study, 200 students were taken randomly from secondary school of Ludhiana district only. The stratification is done based on locality of school (rural and urban schools). Concept Acquisition in Social Studies test was prepared by the investigator to collect the data. The Cognitive Ability test introduced by Gupta and Lakhani (2018) was utilized for measuring students' cognitive abilities. The research data was analysed using 't' test and ANOVA (one-way).

#### 4.1. ANALYSIS AND INTERPRETATION OF DATA

To investigate the difference in concept acquisition of secondary school students with respect to cognitive ability, secondary school students had been divided into three categories- students with high, average and low cognitive ability on the basis of Mean  $\pm$  SD. The average score for students in the cognitive ability variable was computed as 17.03, with an SD of 5.49. The students scoring  $\geq 17.03 + 5.49 = 22.52$  in cognitive ability were termed as students with high cognitive ability and the students scoring  $\leq 17.03 - 5.49 = 11.53$  in cognitive ability were termed as students with low cognitive ability. Table 1 shows the concept acquisition of secondary school students with respect to high, average and low cognitive ability and Table 2 shows the results of one-way ANOVA.

**Table 1** Level of concept acquisition of secondary school students with respect to high, average and low cognitive ability

| Variable          | Cognitive ability | N   | Mean  | SD    |
|-------------------|-------------------|-----|-------|-------|
| Cognitive ability | High              | 42  | 44.60 | 6.25  |
|                   | Average           | 125 | 39.93 | 10.02 |
|                   | Low               | 33  | 35.30 | 10.19 |

**Table 2** Results of one-way ANOVA

|                | Sum of Squares | df  | Mean Square | F    | Sig. |
|----------------|----------------|-----|-------------|------|------|
| Between Groups | 1611.35        | 2   | 805.68      | 9.13 | .000 |
| Within Groups  | 17383.44       | 197 | 88.24       |      |      |
| Total          | 18994.80       | 199 |             |      |      |

F-value (9.13) is greater than the critical F-value at the chosen significance level (such as 0.05), Therefore, we reject null hypothesis 1. This indicates a significant statistical difference in how secondary school students grasp concepts based on their cognitive abilities.

The results of table 1 show significant difference in concept acquisition of secondary school students with respect to high, average and low cognitive ability. The comparison of mean scores indicates that students with high cognitive ability demonstrate the highest level of concept acquisition, while those with low cognitive ability exhibit the lowest level.

**Table 3** Difference in concept acquisition with respect to locality of schools

| Variable            | School        | N   | Mean  | Std. Deviation | Std. Error Mean | t-value | p-value |
|---------------------|---------------|-----|-------|----------------|-----------------|---------|---------|
| Concept Acquisition | Rural schools | 100 | 44.65 | 7.18           | 0.72            | 7.34    | .000    |
|                     | Urban schools | 100 | 35.64 | 9.96           | 1.00            |         |         |

Table 3 results indicate that a notable difference exists in how secondary school students in rural and urban areas acquire concepts. The mean gain score of rural school is 44.65 and standard deviation is 7.18. The mean gain score of urban school is 35.64 and standard deviation is 9.96. The t-value of 7.34 is significant at the 0.05 level. Thus, the null hypothesis 2 is rejected, indicating that the locality of school (rural vs. urban) significantly affects concept acquisition.

**Table 4** summary of 2-way ANOVA showing interaction effect of cognitive ability and locality of school

| Source                                 | Type III Sum of Squares | df  | Mean Square | F     | p-value |
|----------------------------------------|-------------------------|-----|-------------|-------|---------|
| Cognitive ability                      | 1276.58                 | 2   | 638.29      | 9.21  | .000    |
| Locality of school                     | 2753.38                 | 1   | 2753.38     | 39.71 | .000    |
| Cognitive ability * Locality of school | 124.88                  | 2   | 62.44       | 0.90  | .408    |
| Error                                  | 13450.27                | 194 | 69.33       |       |         |
| Corrected Total                        | 18994.80                | 199 |             |       |         |

Table 4 shows that:

- 1) The main effect of cognitive ability on concept acquisition is significant at .01 level ( $F=9.21, p=.000$ ).
- 2) The main effect of locality of school on concept acquisition is significant at .01 level ( $F=39.71, p=.000$ ).
- 3) The interaction effect of cognitive ability and locality of school on concept acquisition is not significant at .05 level ( $F=.90, p=.408>.05$ ).

The F-value (from Table 4) for the interaction between cognitive ability and school locality concerning concept acquisition in Social Studies is 0.90, indicating no significance at the 0.05 level. This indicates that the mean scores of concept acquisition in Social Studies for rural and urban school students at different (three) levels of cognitive ability do not differ significantly. This means that there is no statistically significant difference in concept acquisition of secondary school students with respect to cognitive ability and locality of school. Hence, we accept null hypothesis 3, which states that there is no significant difference in concept acquisition among secondary school students concerning both cognitive ability and the locality of the school. Thus, the null hypothesis would stand, suggesting that cognitive ability and locality of school factors do not significantly affect concept acquisition in this context.

This finding demonstrates that the effects of cognitive ability and locality of school are not significantly interdependent in explaining concept acquisition in Social Studies among secondary school students. Therefore, it is concluded that the concept acquisition in Social Studies of secondary school students is not influenced by the interaction between cognitive ability and locality of school.

## 5. FINDINGS

Based on the above results, the following are the major findings of the present study:

- The concept acquisition of secondary school students showed significant variation with respect to high, average and low cognitive ability. Students with a high cognitive ability had the highest mean scores, followed by those with average and low cognitive ability.
- The concept acquisition of secondary school students showed significant differences when analysed on the basis of the locality of school. rural secondary school students demonstrated higher concept acquisition compared to their urban counterparts.
- The concept acquisition in Social Studies among secondary school students is not influenced by the interaction between cognitive ability and locality of school

## 6. DISCUSSION

The primary objective of this research was to examine the relationship between concept acquisition and cognitive ability among secondary school students. The study sampled 200 adolescents from schools in the Ludhiana District of Punjab. The findings indicated significant difference in concept acquisition among secondary school students when analysed on the basis cognitive ability levels. Result is supported by previous studies by Mehar and Lehal (2018) Phillipson and Phillipson (2012), Padmini (2017), Alves, Gomes, Martins and Almeidaa (2017), Melhuish (2010), Gupta and Lakhani (2018) and Malykh and Malykh (2020). The concept acquisition of secondary school students exhibited notable differences when evaluated based on the locality of school. Students attending rural secondary schools displayed higher levels of concept acquisition compared to their counterparts in urban schools.

Result is in line with the studies of Singh and Singh (2007), Akinyele (2011), Owioye and Yara (2011), Osokoya and Akuche (2012), Hooda and Devi (2017), Awodun and Oyeniyi (2018) found that location of school has the impact on the academic achievement of the students. The findings contradict those of Abamba (2021) and Unugo (2023), who concluded that the school's location does not affect students' academic achievement.

The results also demonstrate that there is no significant difference in concept acquisition among secondary school students based on both their cognitive ability and the school's location. The concept acquisition in Social Studies among secondary school students is not affected by the interplay between cognitive ability and the locality of school they attend.

## 7. EDUCATIONAL IMPLICATIONS

The study's results demonstrated a noticeable difference in concept acquisition among secondary school students based on their cognitive abilities, categorizing them as high, average, and low. Additionally, the findings revealed variations in concept acquisition depending on the locality of school attended by the students, with a marked difference observed between rural and urban secondary schools. The study suggested that to enhance academic success, schools should provide additional teaching resources and place greater emphasis on supporting students. Furthermore, the research highlighted that student with high cognitive ability achieved the highest scores in concept acquisition, followed by those with average and low cognitive abilities. This suggests a need for teachers to focus more on students with lower cognitive abilities by organizing activities such as puzzle solving, reasoning classes, brain training games, and employing varied teaching methods tailored to students' needs. The findings also indicated a significant and positive relationship between concept acquisition and cognitive ability, recommending that schools offer cognitive training, reasoning classes, and quiz competitions. Improving cognitive abilities, in turn, is expected to lead to better concept acquisition among students.

## CONFLICT OF INTERESTS

None.

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