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# English Proficiency and Academic Achievement in Science among Secondary School Students

**Dr. Laiphrakpam Nirmala Devi[1], Laishram Arjun Singh[2]**
[1]Assistant Professor, Education Department, Manipur College, Imphal, Manipur, India
[2]Research Scholar, Department of Education, Manipur University, Canchipur, Manipur, India

## Abstract

English language proficiency plays an important role in science learning, as students need to understand scientific concepts, interpret questions, and communicate their knowledge effectively. This study examined the relationship between English language proficiency and science achievement among secondary school students in Thoubal District, Manipur. It also investigated differences in science achievement by school type and gender. A correlational research method was adopted. The population comprised 4,386 Class X students enrolled in schools affiliated with the Board of Secondary Education, Manipur (BSEM), in Thoubal District. A sample of 1,000 students was selected through stratified random sampling based on school type and gender. Data were collected using the English Language Proficiency Test (ELPT), developed by K.S. Misra and Dr. Ruchi Dubey, and the Science Achievement Test (SAT), developed by Jocyline Thokchom, Dr. Aribam Dhaneshwari Devi, and Laishram Nirtish Singh. The test–retest reliability coefficient was 0.79. Pearson's product-moment correlation and independent-samples *t*-tests were used for data analysis. The findings revealed a strong, positive, and statistically significant relationship between English language proficiency and science achievement ($r = 0.774$, $p < 0.001$). Private school students ($M = 32.986$) scored significantly higher than government school students ($M = 24.420$, $t = 9.624$, $p < 0.001$). Similarly, male students ($M = 29.183$) obtained significantly higher scores than female students ($M = 25.184$, $t = 4.079$, $p < 0.001$). The findings highlight the association between English language proficiency and science achievement, as well as differences in achievement by school type and gender. Appropriate language support and equitable learning opportunities may help improve science learning outcomes.

**Keywords:** English proficiency, academic achievement in science, school type, gender, secondary school students.

## Introduction

Language is more than a medium of instruction; it also plays an important role in the development of knowledge and understanding. It enables individuals to acquire, preserve, and communicate knowledge and provides opportunities for independent thinking and inquiry. Through language, learners engage with new ideas, share their experiences, and make sense of

*Corresponding Author Email: arjun.phd.edn@manipuruniv.ac.in
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the world around them. Its role in education is therefore not limited to communication but extends to the development of intellectual abilities. English has gained considerable importance in the modern world because of its widespread use in education, research, science, and international communication. Globalization has further strengthened its role by increasing the exchange of knowledge and information across countries. In India, English serves as a medium of instruction in many educational institutions and provides access to a wide range of academic resources. Consequently, proficiency in English can influence how students engage with different school subjects, particularly those in which textbooks and learning materials are written in English.

In science education, students need to understand technical vocabulary, interpret scientific information, and explain concepts clearly. English language proficiency may therefore be closely associated with their ability to learn science effectively. Students who are comfortable with English may find it easier to understand scientific texts and interpret questions, while those who struggle with the language may face additional difficulties even when they have some understanding of the scientific concepts being taught (Snow, 2010; Lee & Buxton, 2013). This issue deserves attention in Thoubal District, Manipur, where students come from diverse linguistic backgrounds, and many use Manipuri as their home language. For students learning science through English, differences in language proficiency may create difficulties in understanding textbooks, following classroom discussions, and answering examination questions. Such difficulties may also affect their confidence and classroom participation, making it harder for them to demonstrate their understanding of scientific concepts (Abedi & Herman, 2010).

With the growing emphasis on science, technology, engineering, and mathematics (STEM) education in India, understanding the relationship between language proficiency and academic achievement has become increasingly relevant. Against this background, the present study examines the relationship between English language proficiency and science achievement among secondary school students in Thoubal District, Manipur. It also investigates differences in science achievement by school type and gender. The findings may help clarify the role of English proficiency in science learning and highlight the importance of appropriate language support and equitable educational opportunities for students from different backgrounds.

**Significance of the Study**

English language proficiency may play an important role in learning science because many scientific textbooks, technical terms, and learning materials are presented in English. To understand scientific concepts, students need to comprehend these terms, interpret questions correctly, and express their ideas clearly. When students have difficulty understanding English, they may also find it challenging to follow scientific explanations and demonstrate their knowledge in examinations. Thus, English language proficiency may be an important factor associated with students' achievement in science (Snow, 2010).

This issue is particularly relevant in Manipur, where students come from different linguistic backgrounds. In Thoubal District, many students use Manipuri in their everyday communication but encounter English when studying science. For some students, the difference between the language they use in daily life and the language of instruction may

create difficulties in understanding textbooks, following classroom explanations, and answering examination questions. Although previous research has examined the role of language in academic learning, the relationship between English language proficiency and science achievement among secondary school students in Thoubal District requires further investigation. Findings from other regions may not fully reflect the linguistic and educational circumstances of students in this district. It is also important to examine whether science achievement differs across student groups. School type and gender may be associated with different learning experiences and academic outcomes. Studying these differences alongside English language proficiency can provide a clearer picture of science achievement among secondary school students and help identify areas where additional academic support may be needed.

Against this background, the present study investigates the relationship between English language proficiency and science achievement among secondary school students in Thoubal District, Manipur. It also examines differences in science achievement between government and private school students and between male and female students. The findings may help teachers better understand the role of language in science learning and consider suitable strategies to support students. They may also provide useful information for educational administrators and policymakers when planning measures to improve science teaching and learning. Overall, the study seeks to contribute to a better understanding of science achievement in a multilingual educational setting and highlight the need to provide students with appropriate support to meet their learning needs.

**Objectives of the Study**

1. To examine the relationship between English proficiency and academic achievement in science among secondary school students.
2. To compare the academic achievement in science between private and government secondary school students.
3. To compare the academic achievement in science between male and female secondary school students.

**Hypotheses of the Study**

1. There exists no significant relationship between English proficiency and academic achievement in science among secondary school students.
2. There exists no significant difference in the academic achievement of secondary school students in science between private and government secondary schools.
3. There exists no significant difference in the academic achievement of secondary school students in science between male and female secondary schools.

**Literature Review**

Cummins (2020) introduced the distinction between Basic Interpersonal Communicative Skills (BICS) and Cognitive Academic Language Proficiency (CALP), which highlights the challenges non-native English speakers face in academic settings. According to Cummins,

while BICS allows students to engage in everyday conversations, CALP is necessary for success in subjects such as science, which require advanced reading comprehension and critical thinking.

Abedi and Herman (2010) found that English learners (ELs) with limited proficiency struggled to understand scientific texts and to perform well on standardized tests. Similarly, Lee and Buxton (2013) noted that language barriers in science classrooms often lead to misconceptions and lower academic achievement.

Goldenberg (2008) conducted a quasi-experimental study examining the effectiveness of interactive learning methods in science education for ELs. The study concluded that scaffolding techniques, such as visuals and simplified texts, significantly improved students' comprehension and engagement.

Gibbons (2015) highlighted that scientific language is often more complex than everyday English due to specialized vocabulary and abstract concepts. This complexity can create difficulties for ELs, who may require additional support to understand scientific terminology and processes. Similarly, Garcia and Kleifgen (2018) emphasized that English learners benefit from instructional strategies integrating language development with science content.

Hakuta (2011) examined bilingual education policies and found that students who received targeted language support in science classrooms performed better than those in English-only instruction. In contrast, Slavin and Cheung (2005) argued that a well-structured English immersion program could yield positive results with sufficient scaffolding.

**Method**

The present study adopted the Correlational Research Method.

**Population and Sample**

The study population consisted of 4,386 Class X students from schools affiliated with the Board of Secondary Education, Manipur (BSEM), in Thoubal District, Manipur. Stratified random sampling included school type and gender. Using Slovin's Formula (1960) with N = 4,386 and e = 2.77 %, 1000 samples were selected.

Limitations include potential generalisability issues due to the focus on Thoubal District and BSEM schools, and the exclusion of locality and family type from the stratification.

**Tools**

In the present study, the investigator employed the English Language Proficiency Test (ELPT) developed by K.S. Misra and Dr. Ruchi Dubey (2026) and published by the National Psychological Corporation, Agra, and the Science Achievement Test (SAT) developed by Jocyline Thokchom, Dr. Aribam Dhaneshwari Devi, and Laishram Nirtish Singh (2026) and published by Prasad Psycho, Noida.

The reliability of the tools was established using the test-retest method, with a 14-day interval between administrations on a sample of 60 students. The results demonstrated statistical significance at the 0.05 level (two-tailed).

**Table 1: Reliability Measures of the Test.**

| Sl. No. | Reliability Methods | Value |
|---|---|---|
| 1 | Test-Retest method | 0.79 |

*Significant at 0.05 level of significance (two-tailed).

**Results**

**Table 2: Pearson Correlation between ELPT and SAT Scores**

| | | ELPT | SAT |
|---|---|---|---|
| **ELPT** | **Pearson Correlation** | 1 | .774** |
| | **Sig. (2-tailed)** | | .000 |
| | **N** | 1000 | 1000 |
| **SAT** | **Pearson Correlation** | .774** | 1 |
| | **Sig. (2-tailed)** | .000 | |
| | **N** | 1000 | 1000 |

** Correlation is significant at the 0.01 level (2-tailed).

Table 2 presents the correlation between English language proficiency and science achievement among 1,000 secondary school students. The analysis yielded a Pearson correlation coefficient of 0.774, indicating a strong positive relationship between ELPT and SAT scores. In other words, students who scored higher in English language proficiency generally obtained higher science achievement scores. The correlation was statistically significant ($r = 0.774$, $p < 0.001$). Therefore, the null hypothesis stating that there is no significant relationship between English language proficiency and science achievement was rejected. This finding suggests that English language proficiency is closely associated with science achievement among secondary school students in Thoubal District, Manipur. However, the result indicates an association between the two variables and does not establish a causal relationship.

**Table 3: Mean Difference of SAT Scores Between Private and Government School Students.**

| Type of School | N | Mean | SD | p | t | Sig |
|---|---|---|---|---|---|---|
| **Private** | 500 | 32.986 | 9.0339 | 0.000 | 9.624 | Significant |
| **Government** | 500 | 24.420 | 7.7692 | | | |

Table 3 presents a comparison of Science Achievement Test (SAT) scores between students attending private and government secondary schools. The results show that private school students ($N = 500$) obtained a higher mean score ($M = 32.986$, $SD = 9.0339$) than government school students ($N = 500$), whose mean score was 24.420 ($SD = 7.7692$). The difference

between the two groups was statistically significant ($t = 9.624$, $p < 0.001$), indicating that school type was associated with differences in science achievement among the students studied.

Based on this result, the null hypothesis stating that there is no significant difference in science achievement between private and government school students is rejected. The findings indicate that private school students performed significantly better than their counterparts in government schools on the Science Achievement Test.

**Table 4: Mean Difference of SAT Scores Between Male and Female Students.**

| Type of School | N | Mean | SD | p | t | Sig |
|---|---|---|---|---|---|---|
| Male | 500 | 29.183 | 9.4093 | 0.000 | 4.079 | Significant |
| Female | 500 | 25.184 | 8.4443 | | | |

Table 4 compares Science Achievement Test (SAT) scores between male and female students. The results show that male students ($N = 500$) obtained a higher mean score ($M = 29.183$, $SD = 9.4093$) than female students ($N = 500$), whose mean score was 25.184 ($SD = 8.4443$). The difference between the two groups was statistically significant ($t = 4.079$, $p < 0.001$).

Therefore, the null hypothesis stating that there is no significant difference in science achievement between male and female students is rejected. The findings indicate that male students in the sample performed significantly better than female students on the Science Achievement Test.

**Discussion**

The findings revealed a strong, positive, and statistically significant relationship between English language proficiency and science achievement among secondary school students ($r = 0.774$, $p < 0.001$). This suggests that students with higher English proficiency generally tend to obtain higher science scores. The finding aligns with Cummins (2020), who highlighted the importance of academic language proficiency in learning complex subjects. Similarly, Abedi and Herman (2010) and Lee and Buxton (2013) discussed language-related challenges in science learning, while Gibbons (2015) emphasized the difficulties associated with scientific vocabulary and abstract concepts. These studies provide relevant context for understanding the relationship observed in Thoubal District, although the present study does not establish a causal link.

The findings also revealed that private school students ($M = 32.986$) achieved significantly higher science scores than government school students ($M = 24.420$, $t = 9.624$, $p < 0.001$). This difference may warrant further investigation into educational resources, teaching practices, and learning environments. However, these factors were not directly examined in the present study.

Similarly, male students ($M = 29.183$) scored significantly higher than female students ($M = 25.184$, $t = 4.079$, $p < 0.001$). As the reviewed literature provides insufficient directly comparable evidence regarding this gender difference, further research is needed to explore the factors associated with it.

Overall, the findings highlight the relevance of English language proficiency in science learning and the differences in achievement observed across school types and gender. Integrating language development into science instruction, as emphasized by Garcia and Kleifgen (2018), may help address students' learning needs. Appropriate language support and equitable learning opportunities should therefore be considered when planning strategies to improve science education in Thoubal District, Manipur.

## Conclusion

The present study examined the relationship between English language proficiency and science achievement among secondary school students in Thoubal District, Manipur, along with differences in science achievement by school type and gender. The findings revealed a strong, positive, and statistically significant relationship between English language proficiency and science achievement ($r = 0.774$, $p < 0.001$). This suggests that students with higher English proficiency generally tend to achieve higher scores in science. The study also found that private school students performed significantly better than government school students, while male students obtained significantly higher science scores than female students.

These findings highlight the relevance of English language proficiency in science learning, where understanding scientific terminology, interpreting questions, and comprehending academic texts are important. The differences observed across school types and gender further emphasize the need to understand students' varied learning experiences and educational circumstances. However, the study did not establish the causes of these differences, and further investigation is necessary to identify the factors associated with them.

Overall, the study contributes to understanding the relationship between language proficiency and science achievement in the educational context of Thoubal District. It underscores the importance of providing appropriate language support, strengthening science instruction, and promoting equitable learning opportunities for all students. Such efforts may help students engage more effectively with scientific concepts and support improved learning outcomes. Further research across diverse educational settings could provide a broader understanding of these relationships and inform strategies to enhance secondary science education.

## Recommendations and Suggestions for Further Studies

Based on the findings of the present study, schools should take appropriate steps to strengthen students' English language proficiency, particularly their understanding of scientific terminology, comprehension of scientific texts, and ability to interpret questions. Science teachers may incorporate language-support strategies into classroom teaching to help students understand scientific concepts more effectively. Greater attention should also be given to ensuring equitable learning opportunities across school types and genders. Inclusive teaching practices and appropriate academic support may help address differences in science achievement among students.

Further research may be conducted in other districts of Manipur and in other states to determine whether similar patterns exist across different educational and linguistic contexts. Researchers may also examine the relationship between English language proficiency and achievement in other subjects, such as mathematics and social science. In addition, variables such as locality,

socioeconomic status, family background, and medium of instruction could be examined to deepen understanding of students' academic performance. Further studies may explore the factors associated with differences in science achievement between private and government school students and between male and female students. Finally, experimental studies could be conducted to evaluate whether specific language-support strategies improve students' understanding of scientific concepts and their achievement in science.

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**References**

Abedi, J., & Herman, J. L. (2010). Assessing English language learners' opportunity to learn mathematics: Issues and limitations. *Teachers College Record, 112*(3), 487–526. https://doi.org/10.1177/016146811011200303

Best, J. W., & Kahn, J. V. (1995). *Research in education* (7th ed.). Prentice Hall of India.

Cummins, J. (2000). Language proficiency, bilingualism, and academic achievement. In J. Cummins, *Language, power, and pedagogy: Bilingual children in the crossfire* (pp. 198–220). Multilingual Matters. https://doi.org/10.21832/9781853596773-010

García, O., & Kleifgen, J. A. (2018). *Educating emergent bilinguals: Policies, programs, and practices* (2nd ed.). Teachers College Press.

Gibbons, P. (2015). *Scaffolding language, scaffolding learning: Teaching English language learners in the mainstream classroom* (2nd ed.). Heinemann.

Goldenberg, C. (2008). Teaching English language learners: What the research does—and does not—say. *American Educator, 32*(2), 8–23. Retrieved from https://www.aft.org/sites/default/files/periodicals/goldenberg.pdf

Hakuta, K. (2011). Educating language minority students and affirming their equal rights: Research and practical perspectives. *Educational Researcher, 40*(4), 163–174. https://doi.org/10.3102/0013189X11404943

IGNOU. (2018). *Educational research, research reports, and application*. New Delhi: IGNOU.

IGNOU. (2018). *Handbook on dissertation work, Master of Arts (Education)*. New Delhi: IGNOU.

Kothari, C. R., & Gaurav, G. (2019). *Research methodology: Methods and techniques* (4th ed.). New Delhi: New Age International Publishers.

Koul, L. (2009). *Methodology of educational research* (4th ed.). Noida, UP: Vikas Publishing House Pvt. Ltd.

Lee, O., & Buxton, C. A. (2013). Integrating science and English proficiency for English language learners. *Theory Into Practice, 52*(1), 36–42. https://doi.org/10.1080/07351690.2013.743772

Mishra, K.S., & Dubey, R. (2026). *English Language Proficiency Test.* National Psychological Corporation.

Slavin, R. E., & Cheung, A. (2005). A synthesis of research on language of reading instruction for English language learners. *Review of Educational Research, 75*(2), 247–284. https://doi.org/10.3102/00346543075002247

Snow, C. E. (2010). Academic language and the challenge of reading for learning about science. *Science, 328*(5977), 450–452. https://doi.org/10.1126/science.1182597

Thokchom, J., Devi, A. D., & Singh, L. N. (2026). *Science Achievement Test (SAT).* Prasad Psycho.

Wilson, J., & Komba, S. C. (2012). The link between English language proficiency and academic performance. *World Journal of English Language, 2*(4), 1–10. https://doi.org/10.5430/wjel.v2n4p1