

Article

The Role of Medical Graphical Aids in Developing L2 Oral Proficiency

Dr. Balaganapathy M.

Assistant professor, PG & Research Dept of English, Adaikalamatha College, Vallam-Thanjavur, India;
bala131188@gmail.com

Accepted version published on 5th June 2025

DOI <https://doi.org/10.5281/zenodo.15543971>

Abstract: This experimental study investigates the impact of medical graphical materials on developing L2 (second language) speaking skills among rural undergraduate students in Tamil Nadu, India. Drawing from theories in second language acquisition, visual learning, and cognitive psychology, the research explores how visual storytelling can improve fluency, volume, and grammatical accuracy, specifically using medically themed narrative graphics. The sample comprised 30 first-year BCA students, 24 of whom completed the one-week training. Students were divided into experimental and control groups. The experimental group received visual story-based speaking tasks, while the control group engaged with plain-text versions. Assessment was conducted through pre- and post-test speaking evaluations using audio recordings. Findings revealed that the experimental group outperformed the control group in fluency, volume, and grammatical competence. Additionally, students exhibiting attention-related difficulties showed cognitive and behavioral improvements. The results underscore the pedagogical and neurological benefits of integrating multimodal materials, particularly for learners from socioeconomically disadvantaged and low-resource educational settings. The study recommends the inclusion of structured visual aids in L2 speaking pedagogy to enhance learner engagement, retention, and expressive abilities.

Keywords: L2 speaking skills; visual aids; medical graphics; rural learners; ADHD

Introduction

Speaking fluently in a second language (L2) is vital to communicative competence, particularly in academic and professional settings. For learners from rural and underprivileged backgrounds, acquiring effective L2 speaking skills poses a significant challenge due to limited exposure to English in their daily lives. Most often, these students lack access to English media such as newspapers, television, or digital platforms, which hinders their vocabulary development, confidence, and fluency. In response to these challenges, educators have explored innovative strategies to enhance language acquisition, including visual aids and multimodal learning tools.

This study explores the impact of medical graphical materials/narrative visuals with pedagogical and cognitive value on enhancing the English speaking skills of first-year undergraduate students from economically disadvantaged backgrounds. Visual storytelling, remarkably grounded in culturally relatable contexts, can be a robust scaffold for language learning. Medical graphics, known for their clarity, structure, and attention-grabbing qualities, are especially effective in supporting learners with attention-related difficulties such as those associated with Attention Deficit Hyperactivity Disorder (ADHD). By presenting content in a visually rich and structured format, these materials can aid memory retention, stimulate cognitive engagement, and promote oral language production.

The present study investigates whether integrating such visual materials into story-based speaking tasks can improve fluency, volume, and grammatical accuracy among L2 learners. It further seeks to understand how these materials may assist in reducing cognitive resistance and enhancing classroom participation, especially for students showing symptoms of inattention and lack of motivation. By focusing on learners from a rural college in Tamil Nadu, the study contributes to the growing body of research on inclusive and contextually responsive language teaching methods that cater to diverse learner needs.

Literature Review

Research in second language acquisition (SLA) emphasizes the importance of speaking skills as a core component of communicative competence (Canale & Swain, 1980). However, learners from rural and underprivileged backgrounds often face multiple barriers to language acquisition, including limited exposure, low motivation, and inadequate classroom resources (Kumaravadivelu, 2006). Educators have explored task-based learning and multimodal approaches to bridge these gaps to make language instruction more engaging and effective (Ellis, 2003; Willis & Willis, 2007). Visual aids, especially narrative visuals, have improved learner engagement, vocabulary retention, and oral fluency (Paivio, 1991; Mayer, 2001). According to Purnell and Solman (1991), images enhance memory and recall by stimulating dual coding processes in the brain. Studies by Chun and Plass (1996) and Al-Seghayer (2001) found that learners exposed to video and pictorial cues demonstrated significantly better language production than those using text alone. More recent work by Choi and Johnson (2005) highlights that visuals can reduce cognitive overload and enhance learners' ability to process and

retrieve linguistic input. Research by Jalongo (2004) and Nunan (2004) supports using storytelling and visual narrative as a natural way to foster speaking fluency, especially in low-resource contexts. Meanwhile, scholars like Nation (2013) and Thornbury (2005) argue for explicit attention to fluency, accuracy, and complexity, particularly in speaking tasks. In the Indian context, researchers such as Rajendran (2011) and Annamalai (2005) have noted the socio-economic disparities in English education and called for context-sensitive pedagogies that recognize learners' linguistic and cultural backgrounds. Visual tools are also beneficial for learners with attention deficits or ADHD symptoms (DuPaul et al., 2011; Barkley, 2014), as they help maintain focus and aid in structured information processing. In addition, studies by Kalyuga (2009) and Sweller (2010) argue that visual scaffolds can minimize extraneous cognitive load, thereby enhancing learning efficiency. Finally, research by Mohanraj and Nair (2018) and Vasudevan (2020) in Tamil Nadu has shown that integrating culturally familiar content into language instruction, primarily through visuals, boosts learner confidence and oral proficiency. These studies affirm that incorporating structured visual materials into speaking tasks is a promising strategy for improving L2 speaking skills, particularly among rural learners facing cognitive and socio-economic challenges.

Methodology

Thirty-first-year BCA students from Adaikalamatha College, Vallam, Thanjavur, were selected as the sample population for this experimental study. The students were between the ages of 17 and 19. Out of the initial thirty participants, six students dropped out due to irregular attendance, leaving twenty-four active participants for the study. A one-week training schedule, comprising six contact hours, was designed to improve their L2 (second language) speaking skills. Various tools were employed to facilitate and evaluate the experiment, including a Transcent MP3 voice recorder, student profile cards, and medical graphic materials from *Tinkle* magazine. The primary task involved using these visual materials to help students recall information and express themselves orally.

At the beginning of the study, the researcher conducted a baseline speaking test using familiar and relatable topics such as the Internet, Friendship, Cricket, and Mobile Phones. This initial assessment helped determine the students' existing level of L2 speaking proficiency. Based on the results, the students were divided into the experimental and control groups, each of twelve students. The profile cards filled out by the students provided insights into their socio-economic backgrounds. Most students came from economically disadvantaged families, their parents were primarily farmers, and the students lacked exposure to English through newspapers, television news, or other media.

The experimental group received story-based tasks supported by medical graphical aids (e.g., *Kalia the Crow*, *All for Coconut*, *Fresh Fish Sold Here*, *Heavenly Elephant*, *Donkey's Shadow*, and *The Thirsty Crow*), along with a glossary and structured speaking templates. These visual aids were intended to enhance memory and support language production. In contrast, the control group was given the same stories in plain paragraph form, without any accompanying visuals, though they too received glossaries

and templates. The students' speaking performance was evaluated through a post-test at the end of the training period. The recordings captured using the Transcent MP3 voice recorder were assessed using three specific criteria: fluency (5 marks), volume (3 marks), and grammar (2 marks). This structured methodology aimed to investigate the impact of visual storytelling (i.e, Medical Graphics) on the development of English speaking skills among L2 learners from rural and underprivileged backgrounds.

To address ADHD-related issues (Attention Deficit Hyperactivity Disorder), selected medical graphical materials were strategically incorporated into the speaking tasks. These visuals were used to enhance language learning and explore their potential in aiding students' memory retention and word recall. The study aimed to examine how these medical graphics stimulated students' cognitive functions and supported their ability to retain and produce English vocabulary. Furthermore, the researcher observed how such materials could activate specific cognitive processes and potentially bring about subtle, positive changes in the learners' brain function related to attention, memory, and language processing.

Using Medical Graphics

Incorporating medical graphics into the speaking tasks was based on carefully analyzing the students' background information and learning behaviors. The researcher identified several recurring issues that hindered the students' academic progress, particularly in language learning. These included:

1. Listening inattention,
2. Cognitive resistance or reluctance to engage in mental processing,
3. Frequent careless mistakes,
4. Inability to stay focused and a tendency to interrupt others,
5. Lack of involvement and motivation, and
6. Delayed responses in classroom activities across subjects.

Given these challenges, many of which align with symptoms observed in students with Attention Deficit Hyperactivity Disorder (ADHD). Medical graphics, known for their clarity, structure, and narrative appeal, were selected as tools to activate attention, enhance memory retention, and scaffold the mental processes required for effective language use. These materials were especially suited to support learners from rural and underprivileged backgrounds, who often lack access to rich educational resources and require multimodal stimuli to stay engaged. Thus, medical graphics served both a pedagogical and a cognitive purpose, aiming to improve language outcomes and overall classroom behavior and cognitive engagement.

Results and Discussion

The results of the experimental study revealed a significant improvement in the L2 speaking skills of the students in the experimental group compared to those in the control group. Both groups performed similarly in the baseline speaking test, indicating comparable proficiency levels. However, after the one-week intervention, which

included six contact hours, the experimental group showed notable progress in fluency, volume, and grammatical accuracy, as evaluated through the post-test recordings. The students in the experimental group, who were trained using story-based tasks supported by medical graphical materials, demonstrated greater confidence, better vocabulary retention, and more coherent speech delivery. These visual aids, such as *Kalia the Crow*, *All for Coconut*, and *Donkey's Shadow*, served as practical memory triggers, helping students recall story sequences and express themselves with increased fluency. In contrast, the control group, which received the same stories in plain text without visual support, exhibited only marginal improvements, highlighting the positive impact of visual storytelling on language development. Moreover, medical graphics seemed to benefit students with attention-related difficulties. Several participants who initially displayed signs of inattentiveness and lack of motivation began showing improved focus, quicker response times, and more enthusiastic participation in classroom activities. The structured visuals helped reduce cognitive resistance and supported mental organization, enhancing overall language processing. These findings suggest that integrating medical graphics into L2 pedagogy can serve linguistic and cognitive functions, making them especially effective for learners from rural and underprivileged backgrounds.

The performance of the student with roll number 24UBC1988 in the experimental group was commendable. He showed significant improvement in fluency, demonstrating fewer pauses and a more natural flow of speech. His volume was consistent throughout his delivery, making his speech clear and easy to follow. However, there is still room for improvement in grammar, especially with past tense forms. He can further enhance his speaking skills with additional focus on grammatical accuracy, particularly in grammar (i.e., Tenses) usage. Overall, his progress has been promising, and he has displayed good engagement and improvement in language production.

The control group showed some fluency, volume, and grammar progress, but the improvements were more limited than the experimental group's. The lack of medical graphical materials likely hindered their ability to engage more deeply with the content, affecting their ability to recall information and speak more coherently. In conclusion, the control group's development in L2 speaking skills was modest, and they did not demonstrate the same level of fluency or grammatical accuracy as the experimental group, indicating the beneficial role that visual storytelling tools played in enhancing language skills for students in the experimental group.

Conclusion

This experimental study highlights the effectiveness of integrating medical graphical materials into L2 speaking instruction, particularly for learners from rural and underprivileged backgrounds. Visual storytelling as a pedagogical tool significantly enhanced students' oral fluency, volume, and grammatical accuracy. The experimental group, which engaged with narrative visuals, outperformed the control group that received only plain text-based tasks, confirming the cognitive and linguistic benefits of visual scaffolding. The findings further reveal that medical graphics helped address

attention-related challenges, supporting learners exhibiting inattention, low motivation, and delayed response patterns. These visuals served not only as linguistic aids but also as cognitive enhancers, fostering better retention, sustained focus, and more structured language production. Given the socio-economic limitations and educational disparities many rural students face, this study emphasizes the need for inclusive, multimodal teaching strategies to make language learning more engaging, accessible, and effective. Incorporating structured visual materials such as medical graphics into classroom practices can serve dual purposes, improving language proficiency and enhancing overall classroom behavior. Future research can build on these findings by exploring the long-term impact of visual aids and extending such interventions to other language skills and learning contexts.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data sharing does not apply to this article.

Conflicts of Interest: The authors declare no conflicts of interest.

Works cited

- Al-Seghayer, K. (2001). *The effect of multimedia annotation modes on L2 vocabulary acquisition*. *Language Learning & Technology*, 5(1), 202–232.
- Annamalai, E. (2005). *Nation-building in a globalised world: Language choice and education in India*. *Language Policy*, 4(2), 187–206.
- Barkley, R. A. (2014). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (4th ed.). Guilford Press.
- Canale, M., & Swain, M. (1980). *Theoretical bases of communicative approaches to second language teaching and testing*. *Applied Linguistics*, 1(1), 1–47.
- Choi, H. J., & Johnson, S. D. (2005). *The effect of problem-based video instruction on learner satisfaction, comprehension, and retention in college courses*. *British Journal of Educational Technology*, 36(5), 885–895.
- Chun, D. M., & Plass, J. L. (1996). *Effects of multimedia annotations on vocabulary acquisition*. *Modern Language Journal*, 80(2), 183–198.
- DuPaul, G. J., Weyandt, L. L., & Janusis, G. M. (2011). *ADHD in the classroom: Effective intervention strategies*. *Theory Into Practice*, 50(1), 35–42.
- Ellis, R. (2003). *Task-based language learning and teaching*. Oxford University Press.
- Jalongo, M. R. (2004). *Storytelling: Supporting language and literacy development*. *Teacher Educator*, 39(3), 222–229.

- Kalyuga, S. (2009). *Cognitive load theory: How many types of load does it need?* Educational Psychology Review, 21, 1–19.
- Kumaravadivelu, B. (2006). *Understanding language teaching: From method to postmethod*. Lawrence Erlbaum Associates.
- Mayer, R. E. (2001). *Multimedia learning*. Cambridge University Press.
- Mohanraj, J., & Nair, R. (2018). *Using culturally embedded materials in ELT classrooms*. Journal of Language and Education, 4(1), 55–63.
- Nation, I. S. P. (2013). *Learning vocabulary in another language* (2nd ed.). Cambridge University Press.
- Nunan, D. (2004). *Task-based language teaching*. Cambridge University Press.
- Paivio, A. (1991). *Dual coding theory: Retrospect and current status*. Canadian Journal of Psychology, 45(3), 255–287.
- Purnell, K. N., & Solman, R. T. (1991). *The influence of technical illustrations on students' reading comprehension in expository text*. Reading Research Quarterly, 26(3), 277–299.
- Rajendran, S. (2011). *Teaching English for employability: A framework*. Language in India, 11(6), 431–448.
- Sweller, J. (2010). *Cognitive load theory: Recent theoretical advances*. In J. Plass, R. Moreno, & R. Brünken (Eds.), *Cognitive load theory* (pp. 29–47). Cambridge University Press.
- Thornbury, S. (2005). *How to teach speaking*. Pearson Education.
- Ur, P. (2012). *A course in language teaching: Practice and theory*. Cambridge University Press.
- Vasudevan, L. (2020). *Language education in Tamil Nadu: Challenges and changes*. Indian Journal of Language Education, 6(2), 77–91.
- Willis, J., & Willis, D. (2007). *Doing task-based teaching*. Oxford University Press.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of Magnus Publishing and/or the editor(s). Magnus Publishing and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.