

Adopting Technology-Driven Cognitive Strategies to Enhance English Proficiency in Rural Background Undergraduate Students

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Abstract—Human beings are gifted with many skills like thinking, inventing, and improving. Their intriguing nature makes them different from other living beings. Their interest inspires them to learn new things, different languages, and novel experiments. Furthermore, innovation comes through this continuous learning and deep thinking. Learning is a challenging and meticulous journey that relies on natural talents and inner perseverance. Additionally, the flow of our learning development progresses through the stages of sensory and motor skills, cognitive abilities, and comprehensive power. Technology-based cognitive strategies leverage digital tools and platforms to enhance the learning process, making it more engaging, accessible, and effective. These strategies focus on using technology to actively process, understand, and apply knowledge in ways that improve the language proficiency of rural background undergraduate students. Thus, this paper discusses how technology can support cognitive strategies and cognitive skill development for improving the English proficiency of Rural Background Undergraduate (RBU) students. Moreover, it also discloses how cognitive software reveals how a person understands and reacts to certain things and situations.

Index Terms—rural background undergraduate students, technology-based cognitive strategies, cognitive tests, learning process and English proficiency

I. INTRODUCTION

Improving English proficiency for Indian undergraduate students from rural backgrounds can be effectively achieved through the adoption of cognitive strategies. The difference between human beings and living beings is rationality and logical thinking. Humans are homosapiens with knowledge, common sense, and reasoning. This thinking and awareness were called “cognition” in the past. Anderson (1980) pointed out that “cognitive areas deal with memory, perception, and mental imagery. The word ‘cognitive’ comes from the Latin verb ‘cognosco,’ meaning ‘I know or perceive,’ and the noun ‘gnosis’ means ‘to conceptualize or to recognize’” (p. 23). Moreover, brain-based skills fall under cognitive skills. Through brain-based skills, people can improve their memory power, perceptual talents, rational thinking, and creative concepts. This paper explains the various exercises in cognitive functioning, starting from the simple to the

complex, from the more complex to the most complex, and includes graphic organizers that can improve memory power, concentration, and analytical skills.

When observing people's performance, it becomes evident that some individuals excel due to their natural abilities. For instance, in a class of 100 students, only a small group, typically five to ten, demonstrates exceptional brilliance, while the others may display only average abilities across academic and extracurricular activities. Meanwhile, some students identified as slow learners might perform poorly academically but excel in areas such as fine arts, literature, or sports. This variation raises concerns about how the use of strategies impacts students' cognitive abilities and, ultimately, their academic achievements. In the context of learning a new language, cognitive and metacognitive strategies play a crucial role in helping learners plan, prepare, and execute effectively. With consistent practice, these strategies can significantly enhance cognitive skills and overall performance. It is important to note that "cognitive abilities, or mental skills, encompass traits such as perception, attention, memory, verbal ability, visual and spatial processing, and executive functions" (Parnrod, 2011, p. 260). There are notable differences in performance between males and females. Women often excel in verbal skills, perceptiveness, precision, and fine motor coordination, while men tend to surpass women in pragmatic problem-solving and mathematical abilities. For instance, given a grocery list, women generally purchase the items quicker than men but may struggle with navigating routes or giving precise driving directions.

Types of Cognitive Strategies

"Cognitive strategies refer to the mental processes individuals use to acquire, process, store, and retrieve information. These strategies play a crucial role in learning, problem-solving, and decision-making and enables individuals to enhance their understanding and retention of knowledge" (O'Malley & Chamot, 1990).

To promote active learning, self-awareness, and intentional practice, tailored cognitive strategies can be pivotal. Here are specific cognitive strategies that can be implemented:

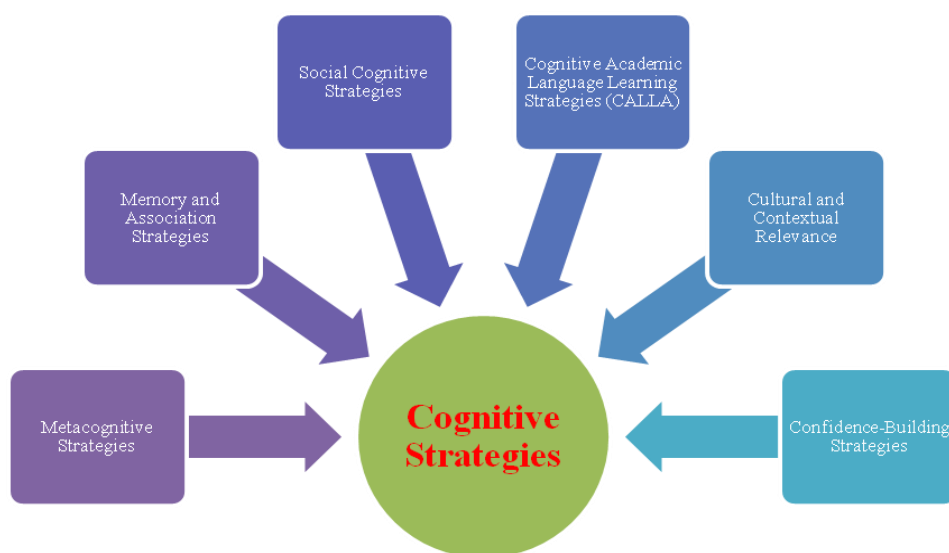


Figure 1. Cognitive Strategies

A. Metacognitive Strategies

1. Set goals by encouraging students to set realistic, short-term, and long-term goals for improving their English, such as learning five new words daily or writing a paragraph weekly
2. Train students to assess their understanding while reading, writing, listening, or speaking. For instance, they can reflect on what they understood from a text or conversation.
3. Provide opportunities for students to review their progress, identify areas of improvement, and modify their strategies accordingly.

B. Memory and Association Strategies

1. Teach students to link new English words to familiar concepts in their native language. For example, they can associate the English word "innovate" with a local term for creativity.
2. Use visual tools to help students organize and connect ideas, such as creating maps for vocabulary or grammar rules.
3. Reinforce vocabulary and grammar through spaced intervals to enhance retention.

C. Social Cognitive Strategies

1. Use collaborative learning, which encourages paired students in peer-to-peer learning or group discussions to practice conversational skills in a non-judgmental environment.

2. Use role-plays or simulations to provide realistic contexts for language use, such as job interviews or technical presentations.
 3. Establish English-speaking clubs where students can practice regularly and gain confidence.
- D. Cognitive Academic Language Learning Strategies (CALLA)*
1. Content integration combines English learning with technical subjects, like, for instance, assigning tasks requiring students to explain engineering concepts in English.
 2. Note-taking teaches structured techniques on taking notes during lectures to develop comprehension and summarization skills.
 3. Problem-solving tasks are language-focused problem-solving activities that involve reading comprehension, data interpretation, or critical reasoning.
- E. Cultural and Contextual Relevance*
1. Localized learning materials create learning content that incorporates familiar cultural elements, making the material relatable and easier to grasp.
 2. Community resources involve local communities or alumni who can share experiences of using English in professional settings.
- F. Confidence-Building Strategies*
1. Micro-talks will enable students to deliver short speeches or presentations on topics of their interests.
 2. An error-tolerant environment will foster an environment where mistakes are treated as part of the learning process.
 3. Celebrating small wins can recognize and reward incremental progress to boost motivation.

Combining continuous assessment with constructive feedback empowers learners to refine their cognitive strategies, leading to better comprehension, retention, and application of knowledge.

II. TECHNOLOGY-BASED COGNITIVE STRATEGIES

Cognitive strategies, often used in learning, memory retention, problem-solving, and mental agility, can be effectively supported through technological approaches. These strategies stress practice in the classroom that is often neglected by the language learners. Students frequently miss potential practice opportunities because while one student recites, others sit idle and watch his/her performance. Moreover, cognitive strategies require many hours of practice to reach proficiency among language learners. Still, technology offers numerous ways to practice and enhance cognitive strategies, leveraging interactive, adaptive, and engaging tools.

Supported by technology, cognitive strategies practice involves computer programs like Eliza that are designed to enhance cognitive abilities such as memory and attention. Grounded in cognitive psychology principles, these programs play a vital role in achieving success in both academic and personal circles. Cognitive software is particularly beneficial for individuals struggling with cognitive or mental challenges, including schizophrenia, ADHD, learning disabilities, chronic headaches, and insomnia.

Cognitive retraining software is also instrumental for individuals recovering from head injuries, helping them relearn essential skills like matching, association, and memory tasks. Moreover, such technology is widely used in workplaces worldwide to improve performance. By fostering innovative problem-solving approaches and enhancing the ability to process complex information, cognitive software helps individuals become more efficient and valuable in their professional roles.

Memory training, a core feature of cognitive software, strengthens intelligence and memory through techniques like rhyming and chunking. Rhyming assists in memorizing phrases by associating them with similar-sounding words, such as “two is for glue.” Chunking, on the other hand, simplifies remembering long sequences, such as phone numbers, by breaking them into smaller, manageable parts. For example, the number 1234567 becomes easier to recall when divided into chunks like 123-4567. These techniques make learning more effective and accessible for users.

Technology can make practicing cognitive strategies accessible, engaging, and effective. By integrating these tools into education, therapy, or self-improvement plans, users can tailor their learning experiences to their individual needs and goals (Chris et al., 2012, p. 164).

A. Memory Enhancement

1. Spaced Repetition Tools: Apps like Anki or Quizlet use algorithms to optimize the review schedule for better long-term memory retention.
2. Chunking Techniques: Software supports breaking down information, like numbers or concepts, into smaller, more manageable chunks for improved recall.
3. Mnemonic Aids: Digital tools incorporate rhymes, acronyms, and associations to facilitate easier memorization.

B. Attention Training

1. Mindfulness Apps: Applications like Calm and Headspace improve focus and reduce distractions through guided meditation and breathing exercises.
2. Brain-Training Games: Platforms like Lumosity and Elevate provide exercises targeting attention, reaction speed, and sustained focus.

3. Biofeedback Devices: Wearables such as Muse measure brain activity to train users in maintaining attention and reducing cognitive overload.

C. *Problem-Solving and Critical Thinking*

1. Simulation and Strategy Games: Digital games like *The Sims* or *Portal* develop logical reasoning and strategic thinking.
2. Coding Platforms: Interactive coding tools like Scratch or Codecademy enhance problem-solving skills through programming tasks.
3. AI-Powered Learning: Tools like Duolingo adapt to a user's learning pace, enhancing problem-solving in language acquisition.

D. *Cognitive Retraining*

1. Rehabilitation Software: Programs like BrainHQ assist individuals recovering from head injuries by improving skills such as matching, memory, and spatial awareness.
2. VR-Based Therapy: Virtual reality immerses users in scenarios to practice cognitive skills in a safe, controlled environment.
3. Task-Specific Tools: Applications help users with ADHD or learning disabilities manage executive functions, such as organization and prioritization.

E. *Workplace Applications*

1. Productivity Apps: Platforms like Trello and Notion aid in planning, organization, and task management to enhance cognitive performance at work.
2. Problem-Solving Simulations: Workplace training tools provide scenarios for employees to practice decision-making and information processing.
3. AI Analytics: AI-powered systems offer real-time feedback to optimize.

F. *Collaborative Learning and Social Skills*

1. Online Discussion Platforms: Tools like Slack and Teams encourage collaboration and collective problem-solving.
2. Gamified Learning: Apps like Kahoot! engage teams in interactive learning activities, improving cognitive and social skills.
3. Peer-Assisted Software: AI chatbots and virtual tutors provide support and encourage group engagement.

Technology-Based Cognitive Strategies and Their Advantages

1. Channels like BBC Learning English or Learn English with Emma provide engaging lessons.
2. Streaming services like Netflix allow learners to watch content with subtitles for simultaneous reading and listening practice.
3. Apps like Spotify or YouTube Music help learners practice listening through lyrics and rhythm.
4. Platforms like Reddit (Language Learning Communities) or Quora provide spaces for discussions in English.
5. Collaborative tools like Google Docs or Padlet enable group work and peer feedback on English writing tasks.
6. Join English learning groups on Facebook, WhatsApp, or Telegram for constant exposure and peer interaction.
7. Apps like EFSET, IELTS Prep, or TOEFL Practice Online simulate test environments and track progress.
8. Apps like LingQ provide analytics on reading, listening, and vocabulary growth.
9. Use digital quizzes on platforms like Kahoot! or Socrative to evaluate understanding.
10. Apps like Duolingo Max use AI to adapt lessons based on user performance and needs.
11. Use AI-driven platforms for personalized question answering and conversational practice.
12. Virtual reality apps like ImmerseMe or Mondly VR simulate real-life environments for immersive practice.

By integrating technology-based cognitive strategies into their learning routine, students can achieve faster and more efficient English language proficiency while staying motivated and engaged. It makes learning interactive and enjoyable and enables learning anytime, anywhere. It also provides instant corrections and suggestions. Technology-based cognitive strategies offer dynamic and personalized methods to enhance mental agility and problem-solving capabilities. By utilizing such tools, individuals can overcome cognitive challenges, improve memory and focus, and excel in academic, personal, and professional endeavors.

III. STRATEGIES TO ENHANCE COGNITIVE ABILITIES

Consistently implementing these strategies can enhance mental clarity, improve problem-solving skills, and strengthen overall cognitive performance.

A. *Physical Activity*

Since ancient times, physical activities have been recognized not only for enhancing physical fitness but also for sharpening mental abilities. Engaging in exercises such as swimming, running, and jogging boosts cognitive skills and stimulates creativity. These activities trigger the release of specific molecules that enhance cognitive abilities and keep the brain active. Additionally, sports and games improve brain functionality, alleviate stress, and counter negative thoughts.

B. *Fine Arts and Mind Games*

Learning fine arts, including classical music, instrumental music, painting, dance forms (both classical and western), sculpture, and collage art, mitigates memory loss and enhances cognitive functions. Mentally stimulating activities like word puzzles, Sudoku, and solving Rubik's cubes play a vital role in developing cognitive skills. Studies show that maestros in various fields excel due to their exceptional memory and cognitive abilities. Neuroscientists have identified multiple ways musical training improves brain connectivity and functionality. Playing an instrument not only increases brain volume but also strengthens inter-regional communication. Starting musical training before the age of seven is particularly beneficial, as it enhances sensory information processing.

C. Creativity and Imagination

Encouraging children to participate in arts and crafts boosts their cognitive abilities and imagination. Surveys indicate that individuals with patents often actively engaged in creative pursuits during their childhood, fostering innovative thinking. Artists, scientists, writers, and business leaders who immerse themselves in creative activities bring original and inventive ideas to their respective fields.

D. Reading Books

Reading is another powerful activity that enhances cognitive performance. Books provide both pleasure and a wealth of knowledge, aiding in career success. Fiction, in particular, stimulates brain functions, memory, empathy, and problem-solving skills. By immersing themselves in stories, readers develop the ability to understand and empathize with others, akin to how athletes mentally strategize their games.

E. Sociability and Cognitive Skills

People who are sociable, friendly, and extroverted often exhibit superior cognitive functioning compared to introverts. Reserved individuals, on the other hand, tend to face challenges in social interactions, which may lead to psychological issues, isolation, and even extreme behaviors. Healthy social interactions foster better mental health and reduce such risks.

F. Yoga and Meditation

Exercises like yoga and meditation are vital for enhancing cognitive and metacognitive abilities. These ancient techniques improve focus, reduce stress, and promote overall mental well-being. Yoga offers physical fitness, while meditation fosters concentration, creating a harmonious balance between body and mind. In today's stress-filled world, such practices are essential for maintaining cognitive health and preventing conditions like Alzheimer's and depression.

G. Mental Exercises

Brain teasers and intellectual games are effective tools for improving cognitive aptitude. Doctors often recommend such activities to children and patients with cognitive decline, like those suffering from Alzheimer's. Carefully chosen video games and puzzles promote reasoning, multitasking, and problem-solving skills. These games also serve as stress relievers while enhancing accuracy, logical thinking, and mental agility.

H. Adequate Rest

Cognitive functioning heavily relies on mental health, which requires sufficient rest. Sleep rejuvenates the brain, enhances energy levels, and ensures optimal mental performance. Lack of rest impairs memory, creativity, and problem-solving abilities. Research highlights that six to eight hours of sleep daily is crucial for consolidating learning and generating innovative ideas. Just as machines require lubrication to function effectively, the brain needs rest to produce productive and novel thoughts.

I. Graphic Organizers

Visual tools like graphic organizers significantly enhance learning and cognitive performance. By presenting information visually through diagrams, charts, or illustrations, these tools help students understand and retain knowledge better. They allow learners to connect ideas, break down complex information, and process thoughts more effectively. "Graphic organizers also provide a framework for critical thinking by enabling information compilation, idea generation, evaluation, and reflection. Thus optimizing cognitive performance through all" (Kang, 2004, p. 58). These methods collectively enhance cognitive functioning, improve learning outcomes, and foster mental agility.

IV. EXPERIMENTATION AND RESULTS

Rural Background Undergraduate (RBU) students who are proficient in English can use English to ask questions, comprehend lectures, appraise materials, test ideas, and confront what is being asked in the classroom. This methodology includes the following preliminary study and pre-tests and post-tests conducted later.

1. Three colleges are chosen to teach English using CDs, PPTs, and other videos in the classrooms.
2. Students participated in debates, oral English quizzes, and role-playing in the first year.
3. Students participated in debates, oral English quizzes, and role-playing in the second year.

TABLE 1
LIST OF STUDENTS PRESENTED CDS, PPTs, AND OTHER VIDEOS IN THE CLASSROOMS

Students	EEE	CSE	MECH	CIVIL
VRSEC	45	52	54	48
GEC	58	42	43	40
PVPSIT	115	156	135	150
TOTAL	218	250	232	238

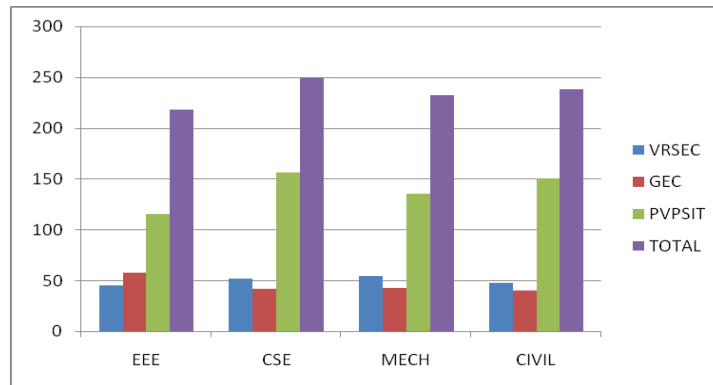


Figure 2. List of Students Presented Videos

TABLE 2
STUDENTS PARTICIPATED IN DEBATE, ENGLISH QUIZ (ORAL) AND ROLE PLAY IN THE FIRST YEAR

Students	EEE	CSE	MECH	CIVIL
VRSEC	15	08	13	11
GEC	09	09	07	12
PVPSIT	35	40	48	66
TOTAL	58	57	68	89

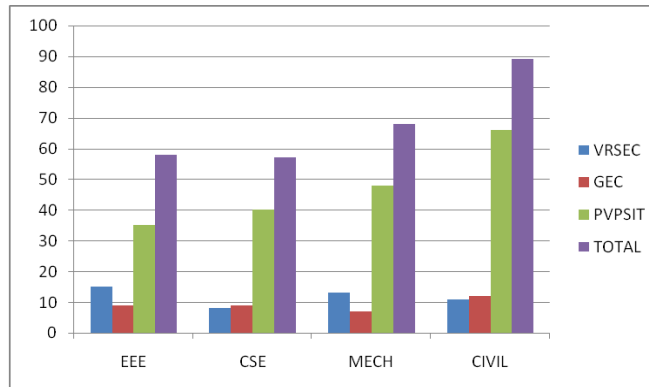


Figure 3. List of First-Year Undergraduate Students' Oral Presentations

TABLE 3
STUDENTS PARTICIPATED IN DEBATE, ENGLISH QUIZ (ORAL) AND ROLE PLAY IN THE SECOND YEAR

Students	EEE	CSE	MECH	CIVIL
VRSEC	28	30	24	35
GEC	15	22	26	20
PVPSIT	65	77	69	113
TOTAL	108	129	119	168

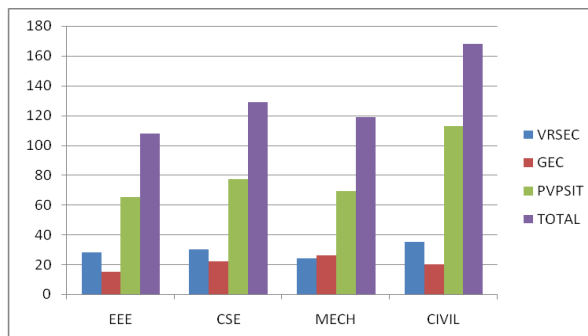


Figure 4. List of Second-Year Undergraduate Students' Oral Presentations

In this study, a preliminary assessment was conducted to know the language proficiency of Rural Background Undergraduate (RBU) Engineering students. Later, two groups were selected to assess the effectiveness of using technology-based cognitive strategies. Since it was deemed impractical to train a larger group, a total of 120 engineering students with rural backgrounds from Gudlavalleru Engineering College, Andhra Pradesh, India, were chosen. These students were civil engineering students, who were divided into two groups—Test Group 1 and Test Group 2—with 60 students in each group. To ensure that both groups were comparable in their English proficiency, a pre-test was conducted. Following this, Test Group 2 was exposed to technology-based cognitive strategies, while Test Group 1 was not. The list of technology-based cognitive strategies by Test Group 2 is shown in the following figure:

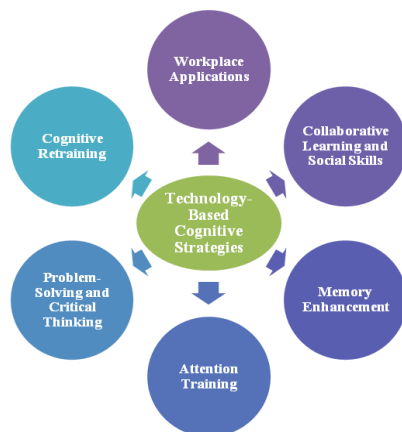


Figure 5. Technology-Based Cognitive Strategies

To begin, a pre-test was administered among the two groups, and the scores were recorded and compared. This presented the English language competency among the RB undergraduate students. Later, Test Group 2 was taught by using technology-based cognitive strategies, while Test Group 1 was taught the same material without any aids, audiovisual or otherwise. Afterwards, a post-test was administered among the groups, and the results were analyzed.

A. Pattern of Pre-Test

Language ability is a key component in the requirements for all entrance examinations that assess English language proficiency in reading, listening, speaking, and writing. Therefore, the researchers designed a pre-test to evaluate the four language skills of ESL students. The pre-test covers various aspects of language skills that are typically included in placement and entrance exams. These include pronunciation, sentence correction, sentence improvement, sentence formation, completing statements, ordering words and sentences, analogies, reading comprehension, antonyms, synonyms, idioms and phrases, one-word substitutes, voice and speech changes, listening comprehension, error identification, critical reasoning, argument analysis, and paragraph formation. Hence, the pre-test is based on language skills and vocabulary components of the English language—synonyms, reading comprehension, word order, sentence formation, phonetics, and presentation. The marks for different sections along with the time allotted for each section are given below:

TABLE 4
MARKS AND TIME ALLOTTED FOR EACH SECTION

Topics	Marks	Duration
Sequencing & Reading	6	12m
Synonyms & Antonyms	6	12m
Idioms & Phrases	6	12m
Word accent	6	12m
Presentations	6	12m
Total	30	60m

B. Pre-Test

The pre-test encompassed all four essential English language skills: listening, speaking, reading, and writing. This trial was conducted by the researchers to gauge the language proficiency levels of Test Group 1 and Test Group 2. The table below presents the marks scored by the two groups in the pre-test, followed by a concise summary of the findings.

TABLE 5
PRE-TEST SCORES OF TEST GROUP 1 AND TEST GROUP 2

Sources	Competency Level	Test Group 1		Test Group 2	
		No	%	No	%
55 and Above	10 Points	Nil	-	Nil	-
41-55	8-9 Points	3	10%	10	23%
26-40	5-7 Points	23	77%	35	77%
25 and Under	Less than 5 Points	4	13%	0	-
Total		30	100%	45	100%

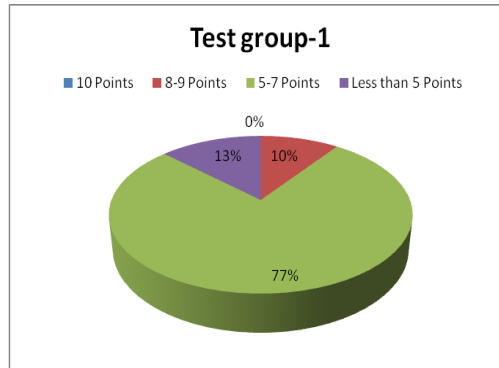


Figure 6. Pre-Test Performance of Test Group 1

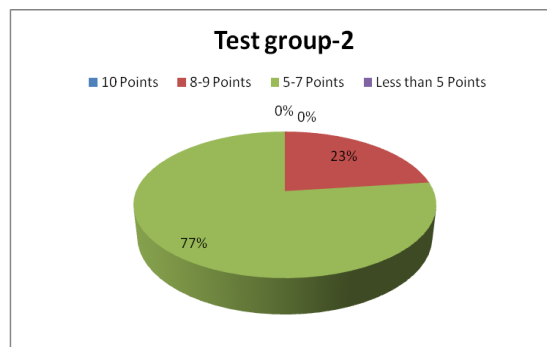


Figure 7. Pre-Test Performance of Test Group 2

The pre-test results for the control and experimental groups showed that only a few of the rural background students (RBU) had a strong command of the language. These results were discussed among the students in the groups. Following this discussion, the researcher decided to implement technology-based cognitive strategies for the experimental group. Five activities were designed to train the experimental group in five key language elements, with a total of four training sessions lasting 60 minutes each.

C. Post-Test

After the researcher utilized audiovisual aids during four training sessions with the RBU students, a post-test was administered to Test Group 1 and Test Group 2. The purpose of this post-test was to assess the effectiveness of the training. The following topics were selected as the basis for the post-test:

TABLE 6
MARKS AND TIME ALLOTTED FOR EACH SECTION

Topics	Marks	Duration
Root words	7	12m
Content words & Function words	7	12m
Summarizing	7	12m
Vocabulary	7	12m
Debate	7	12m
Total	35	60m

D. Analysis of Marks Scored by Two Groups in Post-Test

The table below reveals the marks scored by the Test Group 1 and Test Group 2 in the post-test:

TABLE 7
POST-TEST SCORES OF TEST GROUP 1 AND TEST GROUP 2

Sources	Competency Level	Test Group 1		Test Group 2	
		No	%	No	%
55 and Above	10 Points	Nil	-	31	69%
41-55	8-9 points	6	13%	14	31%
26-40	5-7 points	32	71%	0	--
25 and Under	Less than 5 points	7	16%	--	--
Total		45	100%	45	100%

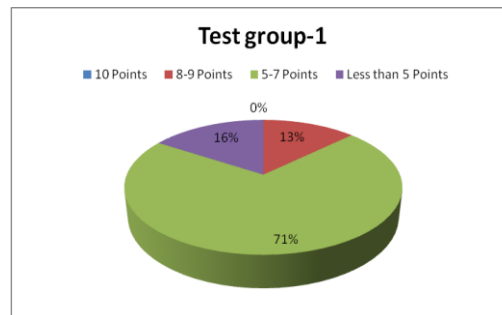


Figure 8. Post-Test Performance of Test Group 1

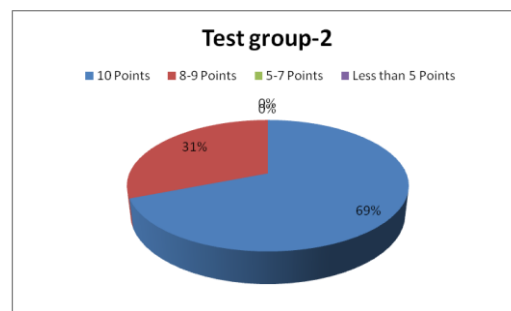


Figure 9. Post-Test Performance of Test Group 2

E. Observations

The researchers first observed that this new classroom instruction created by the researcher will lessen the hurdles faced by the RBU students in learning English. Moreover, this approach creates a dynamic classroom atmosphere and allows students to interact directly with objects. It also lessens their excessive reliance on their first language (L1) and greatly improves their second language (L2) abilities. Furthermore, using information and communications technology (ICT) helps English language students avoid using overly verbose, pointless, and ineffective language while also stimulating all the learner's senses and aiding in improving memory. Additionally, by adopting teaching aids in the classroom, RBU students can make their topic matter clear and present it effectively. It also creates a desire in RBU students to study new things. Finally, this study demonstrated that using technology-based cognitive strategies in English language learning is the most suitable teaching tool for enhancing the English language skills of rural background undergraduate students.

F. Progress of the Students

(a). First Phase

In the first year, many students showed interest but hesitated to participate in oral activities; however, after some motivation, they participated in quizzes and other exercises related to English language and grammar. Furthermore, many students became interested in stories and role-playing and tried to imitate their peers. Though they were not ready to fully participate, some students painted pictures and were ready to listen to the songs and stories.

(b). Second Phase

With encouragement and visual support, many students came forward to participate in the activities, though some students expressed their doubts about the visual aids without a second thought. Nonetheless, most students prepared themselves to listen to the stories and participate in role-playing. While two students argued about the topic in debating, other students encouraged them and enjoyed the session a lot. As a result, debate seemed to be the activity that students liked the most. Students also liked the presentations, videos, graphic organizers, books, and other visuals used by the engineering students and requested that their teachers teach them how to use PowerPoint. Some students found it difficult to continuously speak in English for even just a few minutes. Later, however, with the encouragement of their friends, they managed to speak very well for a longer amount of time.

(c). Further Notes

Along with the expected results from the students and the teachers in the schools, the value of cognitive strategies was also noticeable. Because they observed the difference among the students before using visuals and after using visuals, some of the teachers who had their own laptops were ready to use them for the benefit of the students. If the time period is extended, students will really get a great benefit from this methodology, and teachers will see full-fledged development in them. Furthermore, students should be provided with digital support in their education, and language labs should be introduced in primary education also. Moreover, teachers should be given special training in ICT to effectively guide students in applying these strategies. Regularly assess progress and adjust approaches as necessary. By systematically adopting these methods, rural undergraduate students can greatly improve their English language skills, which are essential for academic achievement, career opportunities, and participation in the global community.

V. CONCLUSION

The use of technology has been expanding rapidly across all sectors, including education, particularly in urban areas. To uncover and nurture the potential of rural students, it is vital to introduce advanced technologies and innovative teaching techniques in rural educational institutions. Integrating cognitive and metacognitive strategies with technology can profoundly influence the mindset of rural students. A novel approach to teaching is being developed to ignite their enthusiasm and motivation.

Incorporating technology into language education offers unique benefits that extend beyond language learning to prepare students for the digital age. Computer technologies and the Internet are effective tools for enhancing language instruction, as web-based resources are deeply integrated into modern society. Language learners can now develop skills through activities like writing emails and conducting online research, which also help them adapt to today's information-driven world.

ACKNOWLEDGEMENTS

We are thankful to the Deanship of Scientific Research of Prince Sattam bin Abdul Aziz University, KSA, for their kind support.

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Hari Kumar started his career as a lecturer at the MVGR College of Engineering in 2011 and has continued to lecture there until today. During this time, he has presented 10 papers at various national and international seminars and has also published 10 papers in various journals like ELTAI and IJOES as well as two papers in the web of sciences to his credit. He has also posted 40 poems to storymirror.com, an open platform for poets and story writers.



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