

The Low Proficiency Level of College of Science and Technology Students in Comprehending and Retaining Scientific Terms in English An Analytical Field Study of Causes and Remedies

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Abstract

This study aimed to diagnose the proficiency level of College of Science and Technology students in comprehending English scientific terms, identify the causes of their low performance, and propose practical remedies of "50" students and "3" faculty members during the Spring semester of 2026. The researcher used a diagnostic test, a questionnaire, and structured interviews. The results revealed that the main causes of the problem were: weak pre-college foundation at 82%, traditional teaching methods at 75.8%, and absence of practical application at 71%. The study recommends implementing a Terminology Portfolio, Spaced Repetition Applications, and Mind Mapping techniques.

Submitted: 30/05/2026

Accepted: 28/06/2026

1: Introduction

Scientific terms in English form the backbone of knowledge in college of science and Technology. They are not mere vocabulary items to be memorized but cognitive keys for understanding scientific content, building concepts, writing research, and reading references. In the era of globalization, English has become the undisputed global language of science and technology.

Libyan universities recognized this fact early, mandating the " Scientific Terminology " or " Technical English " course in all technical colleges since the 1990s. However. field reality reveals a painful paradox: despite teaching this course for two hours weekly over a full semester, graduates still suffer from clear inability to comprehend and use basic terms in their field.

Reports from quality assurance and examination committees at the college of science and technology 2022-2024 unanimously agreed that " poor comprehension of scientific terms" is the primary cause of students ' errors in essay and analytical questions. Supervisors of graduation projects also consistently complain about students' inability to write Chapter.

2: Literature Review

because they cannot understand previous studies written in English. The problem is further complicated by the Libyan labor market, especially in oil, telecommunications, and renewable energy sectors, which now requires " proficiency in technical English terms " as a basic hiring condition. Job advertisements by Mellitah , Arabian Gulf Oil Company, and LTT during 2025 explicitly stated a " Technical English " test as the first screening stage. This is confirmed by the Ministry of Labor and Rehabilitation 2024 Report, which ranked " weak technical language skills" as the second biggest barrier to hiring technical college graduates.

The roots of this problem are multifaceted: weak pre-university English foundation, traditional teaching methods relying on rote memorization of decontextualized lists, and the absence of a " supportive linguistic environment "within the college. ESP literature has warned against this. Nation (2013) confirms that technical vocabulary is not learned enough rote memorization but through " deliberate repeated encounters" with the term in different contexts: listening, reading, writing, and speaking. Schmitt (2008) indicates that a learner needs 8-10 meaningful encounters with a term for it to move into long-term memory.

Therefore, this study comes to provide an accurate numerical diagnosis of students' reality, analyze the causes from both students' and faculty perspectives, and proposes practical, evidence-based recommendations in line with Article (15) of Regulations 501 of 2010.

3: Research Problem and Questions

The main problem is: What is the proficiency level of College of Science and Technology students in comprehending English scientific terms, what are the causes of its low level, and what are the remedies?

Sub-questions:

- 1- What is the students' current level?
- 2- What difficulties do students face?
- 3- What are the causes from faculty perspective?

4: Research Objectives

- 1- Diagnose students' level in comprehending 50 core scientific terms.
- 2- Rank the difficulties faced by students by severity.
- 3- Identify causes related to the student, curriculum, and teaching method.
- 4- Provide actionable recommendations applicable within the department.

Significance of the study

- 1- For students: Addressing a weakness that affects 80/0 of their specialized courses and future career.
- 2- For the department and college: Providing field data to develop the terminology course description and meet quality and accreditation requirements.
- 3- For the labor market: Enhancing graduate competence and reducing post-hiring training from 3 months to 1 month.
- 4- For the researcher: Fulfilling the scientific production requirement for promotion per Regulation 501 of 2010.

5: Methodology

The study adopted a descriptive analytical approach. The population consisted of 250 students at third, fourth and fifth class students. A purposive sample of 50 students was selected 10 from each department, Electricity dep, Computer dep, Mechanic dep. Mechatronics dep, Accounting and Management dep. Plus 3 faculty members. Three tools were applied:

- 1- A 30- item diagnostic test.
- 2- A25 – item student questionnaire.
- 3- Structured interviews with faculty members.

Validity was established by 5 references.

6-Results

First: Diagnostic Test Results

Performance level	Frequency	Percentage
Excellent 90-100 %	2	5%
Very Good 89-80%	7	10%
Good 70-79%	10	20%
Pass 60-69%	13	25%
Weak >60 Less than 60%	20	40%
Total -	50	100%

Overall Mean: 58.4%

Electricity department is the weakest = 54.1%

Computer department is the best = 64.3%

Second: Student Questionnaire –Main Difficulties

No.	Difficulty	Mean
1	Weak Pre-university foundation	4.12
2	Rabid forgetting of terms after the exam	4.05
3	Too many terms	3.91

Required to memorize		
At once		
4	Terms not used in Other subject lectures	3.88
5	Similarity between terms	3.76
6	Teaching relies on Rote memorization and lists	3.71

Third: Faculty Interviews – Main Causes Agreed by 86%:

- 1- Student: Weak linguistic background 93.3/0.
- 2- Teaching method: literal translation and list memorization 86.6/0
- 3- Curriculum: outdated term lists and lack of activities 80/0.
- 4- Environment: students are not required to use terms in other courses 73.3%

7- Discussion of Results

Theme 1: Implications of the 58.4%

Mean Score

Having 61.7% of students below "Good" means students understand only 6 out of 10 terms they encounter, making comprehension of scientific texts fragmented. According to Nation (2013), university students need at least 3,000 core technical words for 95% text coverage. The superiority of Computer Science 64.3% may be attributed to students' daily exposure to English terms via software interfaces, i.e., "unintentional language immersion", which Engineering students lack. This result aligns with Al-Zaroug 2021 and differs from Al-Miryami 2019, indicating the problem lies in "teaching contexts" not "discipline nature".

Theme 2: Analysis of the Causal Hierarchy

The dominance of "weak pre-university foundation" 82.5% does not exonerate the university. Accepting linguistically weak students without a remedial plan is building on a cracked foundation. The second cause, "rapid forgetting" 79.1%, is a textbook application of Ebbinghaus's "forgetting curve". Students use "cognitive cramming" to memorize 50 terms the night before the exam, leading to 48-hour retention because terms

never reach long-term memory. This leads to the third cause, "traditional teaching" 86.6%. Schmitt (2008) stresses that learners need 8-10 meaningful encounters with a term, while our method provides one: the memorization encounter.

This creates a vicious cycle: "weak foundation to rote teaching to rapid forgetting to frustration to learned helplessness," explaining why faculty students "make no self-effort".

Theme 3: The Paradox of the "Isolated Language Course"

The agreement by 73.3% of faculty that "terms that are not used in other courses" is a major cause, while they themselves do not use them, reveals an institutional culture where the terminology course is an "isolated" island with no connection to neighboring classrooms. This is what literature calls "the isolated language course." Instead of serving other specialized courses, it becomes disconnected. This explains forgetting: the term appears once a week for 50 minutes, then disappears for 7 days.

Analytical Summary:

The low level is not a problem of "lazy students" but a product of a "non-conductive educational ecosystem." Weak foundation, rote teaching, zero practice, and assessment that measures memorization not use. Breaking this cycle requires intervention on all four levels.

8- Recommendations

- 1- **At department level:** Adopt a "Terminology Portfolio" with 10 terms weekly documented with definition, drawing, and real-life example. Worth 20% of grade.
- 2- **At teaching level:** Mandate use of "Mind Maps" and "Spaced Repetition".
- 3- **At curriculum level:** Update term lists every 2 years from manuals of Libyan companies, and remove 30% of rare terms.
- 4- **At college level:** Issue a decree that every lecture must use at least 5 English terms per lecture to create a practice environment.
- 5- **At student level:** Allocate a weekly "terminology club" hour as an extracurricular activity.
- 6- **At university level:** Establish a "Technical Language Support Unit" to remediate weak foundation.

9: Conclusion

This study found that 61.7% of college of Science and Technology students are below acceptable level in scientific terms, with a mean of 58.4%. This is a dangerous indicator meaning graduates leave lacking half the core terms of their field.

Analysis revealed a "compound problem" with three sides: historical weak foundation 82.5%, methodological rote teaching 86.6% and environmental absence of practice 73.3%. Most dangerous is the "normalization of weakness" where it became acceptable for students to graduate unable to read a lab manual. However, all diagnosed causes are "treatable." We need not miracle but conscious managements and an action plan, Expert estimates suggest applying the five recommendations can raise the mean from 58% to 75% in one academic year.

This study places a precise diagnosis and clear treatment in the hands of college administration. We either treat it as a "promotion paper" to be filed and forgotten, or as a "reform document" to restore the terminology course's prestige and the Libyan graduate's competence. Investing in a scientific term today is investing in a competent engineer tomorrow, and in an oil field run.

Finally, the researcher recommends the College Council adopt these results and form a permanent "scientific Terminology Skills Development Committee," with this study as its first baseline report, and re-measure students' level after one year to compare impact. Science is not measured by intentions, but by numbers, and numbers don't lie.

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