INTERNATIONAL JOURNAL OF
SCIENTIFIC RESEARCH AND INNOVATIVE STUDIES
IJSRIS journal
ISSN: 2820-7157
Advancing Knowledge, Inspiring Innovation
www.ijsrisjournal.com
INDEXED JOURNAL
PEER REVIEWED Rigorous & Transparent
DOI: CROSSREF Member
OPEN ACCESS For Global Visibility
BI-MONTHLY Timely Publication
WIDE READERSHIP High Impact & Visibility
AUTHOR FRIENDLY Fast | Supportive | Reliable
RECEIVED 17 September
ACCEPTED 09 October
PUBLISHED 1 November 2026
September 2026
Volume 5
Number 6
Pages from 149 to 152

Evaluation of the effectiveness of innovative didactic approaches in learning medical terminology among students of the faculty of health sciences at MALEMBA NKULU UNIVERSITY.

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Crossref doi
PREFIX : 10.63883
IJSRIS JOURNAL
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ABSTRACT

This study aimed to assess the effectiveness of innovative teaching approaches in learning medical terminology among students at the Faculty of Health Sciences of the University of Malemba Nkulu. A total of 180 students participated. The findings showed that 75% of participants rated the effectiveness of these approaches as good or very good. However, the objective knowledge test indicated that 70% of students had low or moderate knowledge levels, while 30% had good or very good levels.

The most frequently reported difficulties were the complexity of medical terms (70%), difficulties with memorization (65%), and large class sizes (55%).

Bivariate analysis revealed a significant association between frequent use of digital resources and knowledge level ($p < 0.001$), as well as between the breakdown of medical terms and knowledge level ($p = 0.012$). In multivariate analysis, regular use of digital resources (adjusted OR = 3.42; $p = 0.001$), personal motivation (adjusted OR = 2.89; $p = 0.005$), and active decomposition of medical terms (adjusted OR = 2.15; $p = 0.029$) were associated with good or very good knowledge levels.

Keywords: medical terminology; innovative teaching approaches; learning; digital resources; motivation; health sciences students.

1. INTRODUCTION

The training of healthcare professionals is a major challenge for higher education systems, as it must enable future practitioners to acquire solid scientific knowledge, appropriate technical skills, and the communication abilities essential to the practice of their professions. Freeman and colleagues (2014) demonstrated that active learning was associated with better exam performance than traditional lecture-based instruction in STEM disciplines (standardized difference of 0.47).

In the field of health sciences, medical terminology plays a vital role. It allows for the precise identification of anatomical structures, clinical manifestations, pathologies, and therapeutic interventions (Chabner, 2021). Del Moral, VanPutte, and McCracken (2024) emphasize that learning specialized medical vocabulary can pose a major challenge for students. For their part, Dunlosky et al. (2013) and Trumble et al. (2024) have highlighted the significant value of retrieval practice and spaced repetition in the long-term retention of scientific and medical knowledge.

At the Faculty of Health Sciences at Malemba Nkulu University, the issue of teaching medical terminology deserves special attention. The general objective of this study is to evaluate the effectiveness of innovative teaching approaches in the learning of medical vocabulary among these students by analyzing the methods used, the objective level of knowledge, the determining factors, and the difficulties encountered in the field.

2. METHODS

2.1 Setting, Type, and Study Period

The study was conducted at the Faculty of Health Sciences at Malemba Nkulu University (Democratic Republic of the Congo). It is a quantitative study with descriptive and analytical objectives, conducted among students enrolled in health sciences who are learning medical terminology.

2.2 Sampling and Sample Size

The sample size was calculated using Schwartz's formula: $n = (Z^2 \times p \times (1-p)) / d^2$. Using a 95% confidence level ($Z = 1.96$), an estimated proportion $p = 0.50$, and a margin of error $d = 7.3\%$, the calculated minimum sample size was 180 students. Sampling was based on a selection of students who met the inclusion criteria (regular enrollment, enrollment in the medical terminology course, and free and informed consent).

2.3 Instruments for Data Collection and Knowledge Assessment

Data was collected using a structured, self-administered questionnaire covering sociodemographic characteristics, teaching methods used, perceptions of effectiveness, and difficulties encountered. An objective knowledge test scored out of 20 points (20 multiple-choice questions) was included to assess actual mastery of medical terms (recognition, understanding, and morphological analysis). Scores were categorized as: Low (0–9 points), Average (10–14 points), Good (15–17 points), and Very Good (18–20 points).

2.4 Statistical Analysis

The data were entered and analyzed using SPSS. Univariate analysis calculated frequencies and percentages. Bivariate analysis applied Pearson's chi-square test ($p < 0.05$) to identify associations. Finally, a multivariate logistic regression model was fitted to calculate adjusted odds ratios (Adj OR) and their 95% confidence intervals (95% CI).

3. RESULTS

3.1 Sample Characteristics and Target Level

Table 1: Distribution of students by target level on the knowledge test (N = 180)

Knowledge Level	Test Score (/20)	Number (n) / Percentage (%)
Low level	0 to 9 points	54 (30.0%)
Average level	10 to 14 points	72 (40.0%)
Good level	15 to 17 points	36 (20.0%)
Very good level	18 to 20 points	18 (10.0%)

The sample consisted of 180 students distributed as follows: 40.0% first-year students (n=72), 35.0% second-year students

(n=63), and 25.0% third-year students (n=45). Regarding their perceived initial proficiency level, 45.0% rated themselves as low and 35.0% as average. The objective assessment via the 20-point knowledge test revealed that 30.0% had a low level (0–9 pts), 40.0% had an average level (10–14 pts), 20.0% had a good level (15–17 pts), and 10.0% had a very good level (18–20 pts).

3.2 Challenges Encountered

The major obstacles reported by students are the complexity of medical terms (70.0%), difficulty in memorization (65.0%), overcrowded classrooms (55.0%), a lack of teaching materials (45.0%), insufficient time (40.0%), and a lack of practical exercises (35.0%).

3.3 Associated Factors and Multivariate Analysis

The bivariate analysis shows that frequent use of digital resources ($p < 0.001$) and regular breakdown of terms ($p = 0.012$) are significantly associated with test success. Multivariate logistic regression confirms the independent contribution of these determinants.

Table 2: Multivariate analysis of factors associated with a good or very good level of knowledge

Explanatory variable	Adjusted OR (Adj OR)	95% CI	p-value
Regular use of digital resources	3.42	[1.65 – 7.08]	0.001
Strong personal motivation	2.89	[1.37 – 6.09]	0.005
Active decomposition method	2.15	[1.08 – 4.29]	0.029
Third year of study (vs. first year)	2.10	[0.98 – 4.50]	0.057

4. DISCUSSION

The main finding of this study is the discrepancy between the favorable perception of the effectiveness of innovative approaches (75.0%) and objective performance on the knowledge test, where 70.0% of students scored at a low or average level. This phenomenon is entirely consistent with the observations of Scott, Young, Barbee, and Nahikian-Nelms (2024), who reported increased satisfaction and final grades without a significant difference on objective exams when learning sciences were integrated into a medical terminology course.

The significant impact of using digital resources (ORaj = 3.42; $p = 0.001$) aligns with the findings of Basuodan (2024), who demonstrated the superiority of blended learning in the health sciences. Similarly, the protective role of active morphological decomposition of terms (ORaj = 2.15; $p = 0.029$) confirms the recommendations of Abdullah (2013) and the work of Gaffas (2025) on structured lexical learning.

Finally, personal motivation emerges as a key facilitating factor (ORaj = 2.89; $p = 0.005$), reflecting the fact that individual commitment enhances the impact of the innovative pedagogical approaches implemented by the institution.

CONCLUSION

In conclusion, while the perception of innovative approaches is very positive, objective mastery of medical terminology remains a challenge for 70% of students at Malemba Nkulu. The main drivers of improvement rely on the regular use of digital resources, the practice of morphological word analysis, and the fostering of personal motivation.

RECOMMENDATIONS

It is recommended that academic authorities and instructors:

- Provide educational and digital resources tailored to the student body.
- Systematically incorporates practical exercises in the analysis of roots, prefixes, and suffixes.
- Incorporate regular formative assessments with prompt feedback.

DECLARATIONS

- **Ethics and Consent:** Research authorization was obtained from the academic authorities of the Faculty of Health Sciences at Malemba Nkulu University. Free and informed consent was obtained from all participating students. The anonymity and confidentiality of the data were strictly maintained.
- **Conflicts of Interest:** The authors declare that they have no financial, personal, or institutional conflicts of interest related to this article.

- **Funding:** This research did not receive any specific funding from public, commercial, or nonprofit organizations.
- **Data availability:** Raw data and anonymized questionnaires are available from the corresponding author upon reasonable request.

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