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ORIGINAL

Analysis of Study Strategies and Their Effect on the Academic Performance of Medical Students at a Private University in Paraguay in 2025

Análisis de Estrategias de Estudio y su Efecto en el Rendimiento Académico de Estudiantes de Medicina de una Universidad Privada del Paraguay en el año 2025

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ABSTRACT

Introduction: the methods and resources used to understand information are considered learning techniques. They constitute the basis of all knowledge and are strongly correlated with the academic performance of students. Those who know and master the techniques are more likely to achieve their educational goals than those who do not.
Objective: to evaluate the influence of study strategies on the academic performance of medical students at a private university in Paraguay in 2024.
Method: the methodological design was observational, analytical, and prospective with a cross-sectional approach. The sample consisted of 82 students enrolled in the basic cycle of the Medicine program at a private university in Paraguay.
Results: the greatest predominance among the ages of the students who participated in the study was found between 17 to 25 years representing 67 %, the students of the medical career used various learning techniques, among those used by more than 50 % of the population studied were reading and summarizing texts and the use of educational videos and digital platforms, although the practice techniques with simulators and oral explanation are those that present a stronger positive correlation.
Conclusion: the techniques used by the majority of the student population prove to be not very effective if used alone and according to the participants themselves, they do not generate good academic performance. It is suggested to improve the combination of techniques used to improve academic performance.

Keywords: Students; Learning Techniques; Study Techniques.

RESUMEN

Introducción: los métodos y recursos que se utilizan para comprender una información son considerados como técnicas de aprendizaje, constituyen la base de todo conocimiento y está fuertemente correlacionada con el desempeño académico de los estudiantes, aquellos que conocen y manejan las técnicas son susceptibles a alcanzar sus propias metas educativas a diferencia de aquellos que no lo conocen.
Objetivo: evaluar la influencia de las estrategias de estudio en el rendimiento académico de estudiantes de medicina de una Universidad Privada del Paraguay en el año 2024.
Método: el diseño metodológico fue de tipo observacional, analítico, prospectivo de corte transversal. La muestra estuvo conformada por 82 estudiantes matriculados en el ciclo básico de la carrera de Medicina de una Universidad Privada del Paraguay.
Resultados: el mayor predominio entre las edades de los estudiantes que participaron del estudio se encontró entre 17 a 25 años representando al 67 %, los estudiantes de la carrera de medicina emplearon variadas

técnicas de aprendizaje, entre las que utilizaron más del 50 % de la población estudiada fueron la lectura y resumen de textos y el empleo de videos educativos y plataformas digitales, aunque las técnicas de prácticas con simuladores y la explicación oral son las que presentan una correlación positiva más fuerte.
Conclusión: las técnicas utilizadas por la mayor parte de la población de estudiantes demuestran no ser muy efectivas si se utilizan solas y según los propios participantes no generan un buen rendimiento académico. Se sugiere mejorar la combinación de técnicas utilizadas para mejorar el rendimiento académico.

Palabras clave: Estudiantes; Técnicas de Aprendizaje; Técnicas de Estudio.

INTRODUCTION

Learning techniques are defined as methods and resources used to understand information. David Ausubel explains that meaningful learning facilitates long-term information retention and is characterized by knowledge that is gradually constructed from prior knowledge.[1,2]

This knowledge is acquired through study habits that foster the development of skills, abilities, and competencies to achieve good academic results. These include:

- Time management, which includes daily, weekly, or monthly activities adapted to study needs.
- Paying attention in class, it is essential to concentrate on explanations, and taking notes is also a valuable tool for highlighting the most relevant aspects of the topics covered.
- Daily review: it is important to review every day, not necessarily the same topics, but those that require more attention or understanding.
- Speed reading of the material, which allows you to get an overview of the content to be studied.
- Underlining and summarizing.[3]

In this sense, learning methods form the basis of all knowledge and are strongly correlated with students' academic performance. Those who know and use these techniques are more likely to achieve their own educational goals than those who do not.[2,4]

The objective of this research was to learn about study techniques, considering that university learning is influenced by various factors, such as methodological advances and the development of new techniques adapted to needs and interests, taking into account their correlation with academic performance in students in their first to fourth semesters of medical school at a private university in Paraguay in 2025 during the first academic semester.[5]

In the university setting, learning techniques are the foundation for students' intellectual development. These teaching methods are essential tools for making the learning process active and effective.[6]

Knowing and using the proper techniques, such as summarizing, outlining, mapping, and comprehensive reading, promotes good academic performance. In this sense, the medical degree is known for its heavy academic workload, including long hours of study, constant stress, and demanding subjects, which require a high level of commitment and dedication.[7,8]

In this regard, each medical student needs to develop their own study method suited to their needs, as each person has a unique way of learning and retaining information. Techniques that work for one student may not be effective for another due to differences in learning style, concentration, areas of interest, and personal goals. Developing a study method of their own allows students to capitalize on their strengths, improve their weaknesses, and feel motivated when they see that their efforts are producing results.[6,9]

When starting medical school, many students struggle to keep up with classes because they lack knowledge of study techniques. Given the challenges of adaptation faced by medical students, this work focuses on sharing the best learning techniques, aiming to serve as a guide for students in their first to fourth semesters of medical school at a private university in Paraguay.[10]

METHOD

The methodological design was observational, analytical, prospective, and cross-sectional. The sample consisted of 82 medical students at a private university in Paraguay enrolled in the 2025.1 academic semester of the program's basic cycle and who met the inclusion and exclusion criteria. The students were of both sexes, aged between 18 and 42, and were active in the current semester. Students in the preclinical or clinical cycle of the program and those with academic mobility status were not considered.

RESULTS

Table 1 presents the sociodemographic data, which shows that the age group between 17 and 25 years old is the most prevalent, representing 67 % of the student population participating in the study, of which 61 %

were female, and first-year and first-semester students represented the largest contribution, at 72 % and 66 %, respectively.

Table 1. Sociodemographic characteristics

Variable		Total (n)	Percentage
Age	17-25 years	55	67
	26-39	22	27
	40-50 years old	5	6
Gender	Male	32	39
	Female	50	61
Year of medical school currently enrolled in	First year	59	72
	Second year	23	28
Current semester of medical degree program	First semester	54	66
	Second semester	8	10
	Third semester	14	17
	Fourth semester	6	7

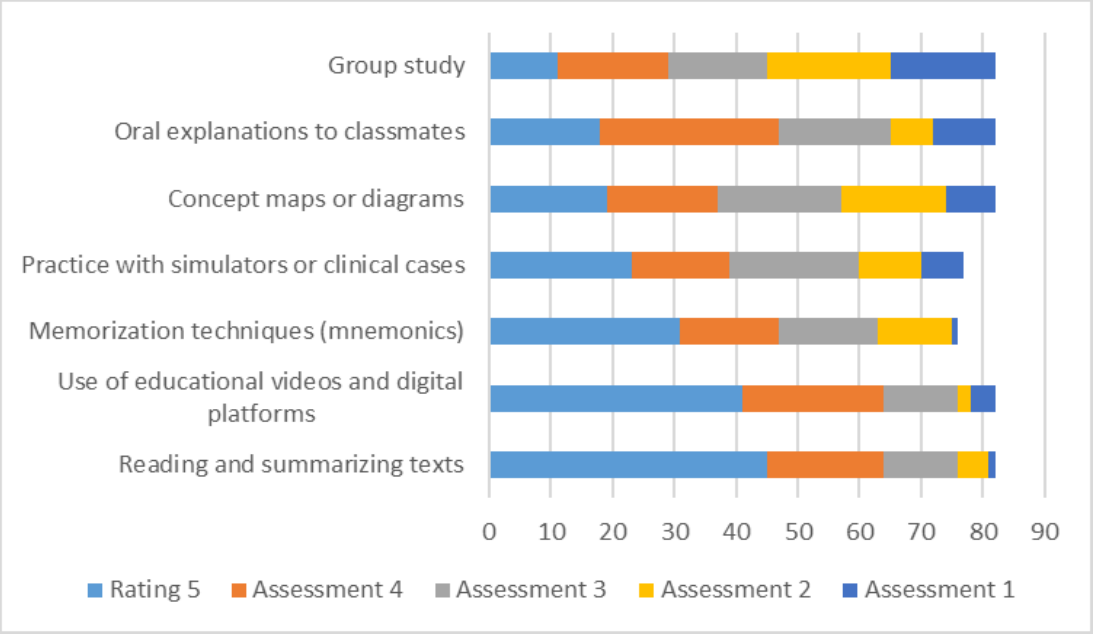

Figure 1. Learning techniques used by medical students at a private university in Paraguay in the 2025 academic year

In the 2025.1 academic period, medical students used a variety of learning techniques, among which the use of reading and summarizing texts and the use of educational videos and digital platforms were evident in more than 50 % of the population studied, while concept maps or diagrams and group study were among the least frequent (less than 25 % use).

Table 2. Learning techniques and their correlation with academic performance

Learning Technique	Correlation Coefficient
Practice with simulators or clinical cases	0,412
Oral explanation to peers	0,487
Concept maps or diagrams	0,254
Memorization techniques (mnemonics)	0,218
Use of educational videos and digital platforms	0,189
Reading and summarizing texts	0,081
Group study	-0,015

As shown in the table, simulator practice techniques and oral explanation have the strongest positive correlation, indicating that participants who use them most tend to perform better academically. In contrast,

reading and summarizing techniques and group study have very low and zero correlation, respectively, suggesting that these techniques alone do not positively influence academic performance. do not positively influence better academic performance.

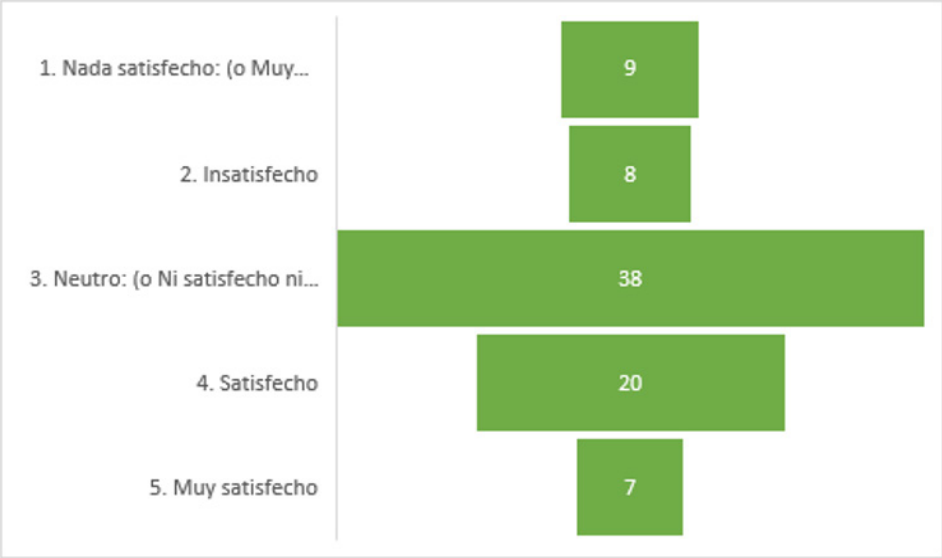

Figure 2. Level of satisfaction with academic performance

Students' perceptions of their own academic performance are strongly skewed toward neutrality, corresponding to 46,6 % of respondents. However, it should be noted that the number of satisfied people is significantly higher than the number of dissatisfied people.

DISCUSSION

The data obtained reveal a divergence between the most commonly used study techniques, the most effective ones, and satisfaction with student academic performance.

The results show that the techniques with the strongest positive correlation with student average and satisfaction are simulator or clinical case practice and oral explanations to classmates. This finding is consistent with the principle of active learning, which states that the more students participate in their learning process, the greater their understanding and retention of information will be.[11] Problem-based learning and explanation help the brain retrieve and apply information, promoting neural connections and embedding long-term learning.[12]

Although their effectiveness is evident, students use active techniques the least frequently. On the contrary, passive strategies such as reading, using educational videos, and summarizing are the most popular. This preference for passive methods of information consumption is often due to a lack of awareness of their ineffectiveness, which may be influenced by extrinsic factors such as time constraints. The scientific literature indicates that simple reading, underlining, and summarization techniques are ineffective for deep learning.[13]

The infrequent use of oral explanation to peers, a very active technique in the learning process and one of the techniques with the highest positive correlation with academic performance, cannot be overlooked. This phenomenon, known as active retrieval or practice testing, is referred to in the literature as a method of forcing the brain to search for and retrieve information from memory to solve questions, rather than simply reading or rereading. However, humans tend to resist learning by force, resulting in wasted time and effort.[14,15,16,17,18] The fact that this technique is rarely used in the population studied could indicate a preference for individual study over exposure to peers.

Beyond methodology (not finding the proper technique), it is essential to note that there are extrinsic barriers, such as psychological barriers (distraction, attention deficit, anxiety) and management barriers (time, organization). This suggests that interventions should not be limited to teaching the most effective learning techniques but should also emphasize metacognition, including strategies that help students reflect on their own thoughts and evaluate their learning process, thereby fostering self-direction to transform their abilities into academic skills.[17,19]

The results obtained, reinforced by the extensive literature, show the widespread predominance of active techniques over passive ones.[18,20] The low adherence of students to active techniques presents an excellent and significant opportunity to implement educational intervention programs. Encouraging paradigm shifts in the methods used, promoting active participation in the learning process through the incorporation of information

technologies, and reducing the simple reception of information are fundamental for significant progress in academic performance and satisfaction.[21]

CONCLUSION

The most widely used techniques differ from the most effective techniques. A large part of the population studied has a strong preference for passive techniques such as reading, summarizing, and mnemonics, which, according to the correlation analyses performed, do not have a positive impact on academic performance. This situation raises critical reflection on prevailing study practices and the need to promote more efficient, evidence-based learning methods.

Student satisfaction with their academic performance is strongly correlated with the use of active techniques. Students feel more confident and satisfied when they can retain and understand information and apply it in practical activities, rather than memorize content.

Students who are dissatisfied with their results add that, in addition to not being able to find a suitable technique, they face barriers such as adapting to the language, distraction, lack of time, and family problems, among others.

Although the results are interesting, there were limitations, such as low student participation in completing the questionnaire, which may be attributed to the topic's lack of appeal to this population.

For future research, strategies should be implemented to encourage greater participation, such as conducting surveys during class periods or in the classroom.

These results lead us to consider implementing educational intervention programs in this area, bearing in mind that they should not only teach new techniques but also address time management and concentration skills to be truly effective.

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CONFLICT OF INTEREST

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