Are Mnemonics Still Relevant for University Students? A Review of Cognitive Foundation, Educational Impact, Limitations and Future Research Directions

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ABSTRACT

University students are supposed to acquire, memorize and practice types of knowledge that are specific to disciplines. They need to recall the factual and procedural details and learn to think analytically, make clinical judgments and solve problems. Mnemonics are organized memory techniques which relate unknown knowledge with meaningful words, pictures, places, patterns or narratives. Despite the occasional criticism of mnemonics promoting surface-level memorisation, current evidence suggests that properly designed mnemonic strategies can support retrieval of information, scaffold highly complex tasks, promote learning, and assist in tapping underlying knowledge. This review examines the persistence of mnemonics in higher education by addressing why they are cognitive, their advantages and their limitations in education, and possible combinations with retrieval practice and digital learning strategies. Evidence is summarised in a consolidated table. This review identified that studies in mnemonics remain constrained by short follow-up periods, single-institution studies, strong reliance on student perceptions, and insufficient assessment of knowledge transfer to authentic professional practice. Future studies should therefore adopt multicenter, longitudinal, mixed-method designs. Additionally, studies should also compare that compare instructor-developed and student-generated mnemonics and assess their effectiveness when used alongside retrieval practice.

Keywords: mnemonics; higher education; memory retention; learning strategies; academic performance

INTRODUCTION

University students are expected to be involved in analysis, evaluation, problem-solving and knowledge creation. The students need to have ready access to relevant foundational knowledge in order to perform these processes. For example, a pharmacy student cannot evaluate the appropriateness of a medication without recalling its indications, contraindications, adverse effects and interactions; a medical student requires accessible knowledge of anatomy and physiology before interpreting clinical cases; and a statistics student must remember the meaning and assumptions of statistical procedures before selecting and applying them to analyse data.

The increasing volume and complexity of university curricula place considerable demands on students' working memory. When learners must devote excessive cognitive resources to recalling basic terms, sequences or criteria, fewer resources remain available for interpretation and application. Cognitive load theory proposes that instructional approaches should minimise unnecessary cognitive demands while helping learners construct organised knowledge structures in long-term memory [1]. Mnemonics may help the student in this process by organising multiple information into more manageable and retrievable forms.

Mnemonics are strategies designed to make information easier to encode, organize and recall by linking it with familiar cues. These clues are the first letter acronym, acrostic sentences, the key word approach, rhymes, stories or other meaningful associations. The use of mnemonics in education is not new; however, the importance of

the technique in modern higher education remains controversial. Opponents claim that they encourage memorization and can distract students of learning. In the meantime, proponents argue that fast access to necessary knowledge can decrease cognitive effort to reason, apply and make decisions.

The most justifiable stance is between these two opinions. Mnemonics are not universal or suitable in all learning outcomes. Nonetheless, studies indicate that they may be useful when students are required to recall structured, sequential, and/or terminology-based or otherwise challenging to recall information. Putnam concluded that mnemonics could best be viewed as aids to retrieval that can be used in conjunction with other evidence-based learning strategies and not as comprehensive learning strategies [2].

The review thus answers one guiding question that is: is the application of mnemonics still pertinent as a method of learning in higher education? It critically discusses the mechanism of mnemonics, their effects on university education, case studies, and weaknesses of existing evidence, as well as future research priorities.

Scope And Approach of The Review

It is a critical review of the narrative that is based on seminal cognitive studies, reviews and empirical studies on tertiary learners. Special focus is put on the research that studies university statistics, medical education, pharmacy education, procedural learning and technology-based mnemonic interventions. It is an interpretive, not a systematic, review; the purpose of the review is to assess the circumstances in which mnemonics can add value to higher education, not to estimate a pooled effect size. Sources were identified through purposive searching of the education and cognitive-psychology literature and were selected for their relevance to tertiary-level learning, the clarity of their methodology and their contribution to the debate on memorisation versus understanding. The principal empirical studies underpinning the review are summarised in Table 1.

How Mnemonics Support Learning

A. Organisation and Retrieval Cues

Mnemonic devices do not necessarily increase the amount of information that human memory can store. Instead, they provide an organised route through which stored information can be accessed. An acronym, for example, can transform several unrelated procedural steps into a single memorable verbal unit; the learner retrieves the acronym and subsequently reconstructs the individual components represented by each letter.

Bellezza distinguished mnemonic devices according to their organisational and encoding functions [3]. Organisational mnemonics provide a structure or retrieval plan for information, whereas encoding mnemonics transform difficult material into a more concrete, familiar or meaningful format; some approaches, including the method of loci and the keyword method, perform both functions. Early experimental work established that different mnemonics vary systematically in their capacity to preserve the order of recalled items [4], and that the keyword method can markedly accelerate the acquisition of unfamiliar vocabulary [5].

The effectiveness of a mnemonic depends partly on the quality of the relationship between the retrieval cue and the intended information. A mnemonic that is meaningful, distinctive, vivid and clearly connected to the learning content is more likely to facilitate retrieval than an arbitrary or overly complicated one. Mnemonics may become counterproductive when students expend substantial effort remembering the mnemonic itself, or when its letters and images bear only weak connections to the target information.

Cognitive Load Reduction

Working memory has limited capacity. When students confront many disconnected facts, they may experience high cognitive demand before meaningful learning can occur. By grouping several elements into a coherent unit, mnemonics may reduce unnecessary cognitive effort and support the formation of organised schemas.

This benefit is particularly relevant in disciplines such as pharmacology, anatomy, diagnostic medicine, chemistry and law, where students must retrieve multiple criteria or procedural components. Recent pharmacy-education research has drawn explicitly on cognitive load theory to explain how mnemonics may simplify

complex information and make foundational knowledge more accessible for higher-order tasks [6]. Nevertheless, reduced cognitive load should not be equated with reduced intellectual effort. Effective learning still requires students to explain concepts, distinguish between similar ideas, practise retrieving information and apply knowledge to unfamiliar situations. Mnemonics should reduce avoidable retrieval difficulty, not remove the productive struggle required for understanding.

Elaboration, Imagery and Multiple Retrieval Pathways

Keyword, narrative and image-based mnemonics prompt the learner to relate new information with the prior knowledge. An abstract information can be made more memorable and memorable through a vivid image or a strange story. Audiovisual mnemonics that are story-based can also be a combination of both the verbal and visual representations, which forms over one possible retrieval pathway.

This was a randomised controlled study of first-year medical students, who were compared to learn story-based audiovisual mnemonics versus traditional text reading [7]. Mnemonic group students scored much higher on multiple-choice and retrieved target keywords faster. The fact that the assessment was repeated immediately and at one, two and four weeks gives evidence that the effect was not limited to immediate recall.

Procedural Organisation

Mnemonics can also reflect the form of a task and not just assist students to recollect individual facts. Radovic and Manzey considered an acronym that coded an eight-step process [8]. Participants with the acronym acquired the sequence of tasks more efficiently and the internal organization of the acronym had an impact on the way the participants mentally encoded and reinstated the procedure following interruptions. The observation applies to the professional education since clinical, laboratory, engineering and safety-related activities often have a sequence of steps to follow. Mnemonics can also serve as brief mental checklists in such situations, aiding learners to ensure procedural completeness and minimize omissions.

Evidence of Relevance in Higher Education

Mnemonics in Tertiary Statistics Education

Statistics is a conceptually challenging course where students need to distinguish related terms, and understand symbols, memorize assumptions and choose the right procedures. Mocko and colleagues studied the use of mnemonics in two sets of large cohorts of students enrolled in a hybrid introductory course in statistics at a university in the United States, which included 1,487 students in 2014 and 1,468 students in 2015 [9]. The research question examined student attitudes toward published statistics mnemonics and the correlation between the use of mnemonics, learning outcomes and anxiety. The mnemonics were, in general, seen by students as helpful in remembering definitions, differentiating between similar concepts and solving examination questions. Notably, the research showed that mnemonics could be applied in large and hybrid classes in universities as opposed to being restricted to small and highly controlled experimental classes. Yet, observational characteristics of portions of the study prevent causal interpretation, since students who decided to use mnemonics might have been systematically different than those who did not.

This example shows a valuable lesson: mnemonics could be particularly helpful when students learn a thing in the classroom but they feel that they have problems recalling the appropriate terminology or procedure on the test. Under these circumstances the mnemonic fails to generate conceptual knowledge; it gives access to information that the student has already studied.

Evidence from Medical Education

Medical education is a typical place where mnemonics are used since it has a lot of factual and procedural content in medical curricula. As it has been mentioned above, Abdalla and colleagues revealed that story-based audiovisual mnemonics were more effective in terms of retention and oral recall compared to text reading in the first-year medical students [7]. The study was based on a small sample of 80 students of a single institution, but its randomised design and the use of repeated follow-up measures contribute to the fact that properly designed

audiovisual mnemonics may be used to facilitate retention not only during the immediate learning session. The results also indicate that the format of the mnemonic can be important: an audiovisual story can be more useful in terms of associations as compared to a first-letter acronym. These materials, however, take more time to develop, and can include multiple active elements - animation, narration, novelty, repetition and emotional involvement, so the perceived benefit cannot necessarily be solely due to the mnemonic element.

Table 1. Summary of principal empirical studies of mnemonics in higher education.

Study	Discipline & design	Mnemonic type	Retention / assessment window	Principal findings
Mocko et al. (2017) [9]	Introductory statistics; two large cohorts (n = 1,487 and n = 1,468) in a hybrid university course	Published first-letter and verbal statistics mnemonics	End-of-course examination and survey	Students rated mnemonics as useful for recalling definitions and distinguishing similar concepts; demonstrates feasibility in large, hybrid classes. Observational design limits causal inference.
Abdalla et al. (2021) [7]	First-year medical students; randomised controlled trial (n = 80), single institution	Story-based audiovisual mnemonics vs. text reading	Immediate, 1, 2 and 4 weeks	Mnemonic group achieved significantly higher multiple-choice scores and faster keyword recall, with effects sustained to four weeks.
Bruno et al. (2012) [10]	Second-year pharmacy students; randomised study (n = 95)	"I ESCAPED CPR" clinical reasoning mnemonic	Immediately post-intervention (case-based examination)	Intervention group scored ~6% higher, made fewer therapeutic errors and demonstrated more systematic decision-making. Durability and transfer to placement untested.
Radović & Manzey (2019) [8]	Procedural-task experiment (cognitive psychology)	Acronym encoding an eight-step procedure	Task performance and resumption after interruption	Acronym improved sequence learning; its internal structure shaped how learners represented and resumed the task after interruption.
Fung & Oyibo (2024) [13]	Scoping review of 12 studies on mnemonic serious games	Game-based / digital mnemonics	Varied across included studies	Nine studies reported positive and two mixed outcomes for memory and engagement; limited evidence on student-created mnemonics and long-term outcomes.
Munusamy et al. (2025) [6]	Second-year Doctor of Pharmacy pharmacology course; two cohorts	13 instructor-generated mnemonics (endocrine and autonomic pharmacology)	Course examination plus follow-up survey ~5 months later	Mnemonic-linked items favored on 6 of 14 questions; >97% of respondents perceived improved retention and clinical application; perceived usefulness persisted at follow-up.

Note. Bracketed numbers correspond to the numbered reference list.

CASE STUDY: MNEMONICS IN PHARMACY EDUCATION

Pharmacy education provides a particularly instructive case because students must master extensive information about drug classes, mechanisms, indications, adverse effects, interactions, monitoring parameters and patient-specific considerations, while pharmacy programmes simultaneously aim to develop clinical reasoning rather than factual recall alone.

The "I ESCAPED CPR" Clinical Mnemonic

Bruno and colleagues developed the patient-centred mnemonic "I ESCAPED CPR" to guide pharmacy students through a systematic assessment of drug therapy [10]. The intention was not simply to help students list pharmacological facts, but to ensure that learners considered all important elements when making patient-specific therapeutic decisions. In a randomised study, 95 second-year pharmacy students were allocated to an intervention or control group. The intervention group received a 30-minute explanation of the mnemonic and its application to clinical cases before completing a case-based examination; the control group completed the examination before being introduced to the mnemonic.

Students who received the mnemonic achieved examination scores approximately six per cent higher than those in the control group, a statistically significant difference, and also demonstrated better therapeutic decision-making and fewer errors [10]. Most students believed that the mnemonic helped, or would have helped, them think critically when assessing the clinical cases. This study challenges the assumption that mnemonics are relevant only to factual memorisation: the mnemonic provided a structured clinical-reasoning framework that prompted students to consider essential information systematically, so its effect was organisational and procedural as well as mnemonic. However, performance was assessed shortly after the intervention. It remains unclear whether students continued using the mnemonic during clinical placements, whether it improved real patient-care decisions, or whether reliance on the tool decreased as expertise developed.

Longitudinal Evidence from Pharmacology Education

More recent evidence was reported by Munusamy and colleagues, who incorporated 13 mnemonics into a second-year Doctor of Pharmacy pharmacology course covering endocrine and autonomic pharmacology, evaluated across two academic cohorts [6]. Mnemonic use was associated with significantly better performance on six of 14 examination questions linked to mnemonic-supported concepts. More than 97 per cent of responding students believed that mnemonics improved knowledge retention and clinical application, and most reported increased confidence, improved critical thinking and reduced learning anxiety. Follow-up survey that was done some five months later showed that students still rated the mnemonics as being useful when they assisted in organising and understanding the underlying concepts.

These results are good longitudinal evidence, which should be interpreted with caution. Some of the results were founded on student perceptions and the students were not randomly assigned to mnemonic and non-mnemonic groups, and self-reported use can be affected by memory, motivation and social desirability. However, the findings also suggest that students did not perceive mnemonics as mere cheating methods on exams; they saw them as a tool to memorize and use pharmacological knowledge.

EDUCATIONAL IMPACT OF MNEMONICS

Improved Recall and Retention

The most consistent benefit of mnemonic instruction is improved retrieval of target information, particularly for material that is arbitrary, sequential, terminology-rich or otherwise difficult to reconstruct through logical reasoning alone — for instance cranial nerves, drug adverse effects, diagnostic criteria, taxonomic categories, legal principles, foreign-language vocabulary, mathematical rules and ordered procedural steps. The durability of these effects nonetheless varies. Putnam observed that some mnemonic techniques produce strong initial learning but less consistent long-term retention [2].

Immediate retrieval practice after mnemonic learning may strengthen the target information and reduce later forgetting; indeed, evidence syntheses of effective study techniques place practice testing and distributed practice among the most robust strategies for durable learning [11], and combining the keyword mnemonic with retrieval practice has been shown to improve delayed vocabulary retention relative to either strategy alone [12]. The most effective instructional approach may therefore be to use a mnemonic for initial encoding and organisation, followed by spaced retrieval over time.

Support for Clinical and Procedural Reasoning

The pharmacy and procedural-learning studies show that mnemonics may lead learners to make structured choices, minimize omissions, aid task-resuming following a break and make sure that critical considerations are made. The advantages are particularly applicable to safety critical areas where partial recall can cause error. However, the performance that is aided by a mnemonic should not be automatically equated with the independent expertise. Teachers need to decide whether students can identify when a mnemonic can be used, whether each element is interpreted correctly, whether the framework can be adjusted to the complicated cases and whether the exceptions can be found.

Confidence and Learning Anxiety

Mnemonics are also reported to enhance confidence and decrease anxiety in students when learning and assessing. Mnemonics seem to provide a point of departure in the face of complicated questions in the education of statistics and pharmacology, which can alleviate the sense of blanking out in the mind and promote a systematic reaction. These benefits of affection are educationally significant although they should be interpreted with care: augmented confidence is good only in as far as it is matched with correct knowledge, and ill-constructed mnemonics may result in false confidence when students memorise a simplified rule but forget its drawbacks.

Engagement and Digital Learning

Mnemonic approaches are increasingly embedded in animations, mobile applications, flashcards, serious games and multimedia platforms. A 2024 scoping review identified 12 studies of mnemonic serious games, of which nine reported positive and two reported mixed outcomes, suggesting potential benefits for memory and engagement [13]. The same review, however, identified limited research on student-created mnemonics, long-term outcomes, social learning and the teaching of mnemonic-construction skills.

Digital delivery may make mnemonics more attractive and accessible, but novelty and entertainment should not be mistaken for learning effectiveness. Studies must distinguish between students enjoying an educational tool, remembering the mnemonic, remembering the target content and applying that content accurately.

The effectiveness of Mnemonics Across Disciplines and Educational Levels

Mnemonics are not uniformly effective, therefore the educators and students should know when and where to use mnemonics in teaching and learning activities. Across disciplines, mnemonics appear to provide benefits when the content is arbitrary, terminology-dense and must be recalled in a fixed form or order such as in anatomy, pharmacology, microbial taxonomy or foreign language vocabulary. In quantitative fields such as in statistics, mnemonics may help the students in memorizing the procedural steps and formula.

Mnemonics may be influenced by the educational level of the users. Much of foundational mnemonic research was conducted with schoolchildren and early undergraduates, so extrapolating to advanced study calls for caution. As the students gain expertise, they increasingly encode new information by folding it into existing schemas, which lowers the marginal value of an artificial cue. Therefore, mnemonics are best understood as scaffolding for the novice phase, and to be faded as schemas mature. This situation can be observed when a mnemonic may improve a first-year recall stage and mnemonics show no advantage on a final-year clinical examination.

LIMITATIONS OF MNEMONIC LEARNING

Mnemonics Do Not Guarantee Understanding

A student may remember an acronym without understanding its components. Mnemonics are therefore unsuitable as stand-alone strategies for outcomes requiring explanation, evaluation, synthesis or transfer, and should be introduced only after, or together with, clear conceptual instruction.

B. Not All Information Requires a Mnemonic

Mnemonics are most appropriate when information is difficult to retrieve yet educationally important. Creating an acronym for every concept may increase rather than reduce cognitive burden. When information can be derived logically from principles, teaching the underlying principle may be more effective than providing an additional memory aid.

C. Oversimplification and Inaccuracy

A mnemonic may omit exceptions, encourage rigid thinking or compress a complex concept into an inaccurate rule. This is especially concerning in clinical education, where treatment decisions depend on patient characteristics and contextual factors. Educators should verify the accuracy of every mnemonic and explain its boundaries clearly.

D. Time Required for Construction

The intricate systems of mnemonics can take a lot of time to learn or develop. Mnemonics that are created by students can facilitate active processing and personal relevance, yet can result in incomplete or scientifically incorrect cues. Mnemonics created by the instructor can be quality checked but they might not be as memorable to students whose language, culture or previous experience is not the same as the instructors.

E. Dependence on Assessment Format

The advantages of Mnemonics might manifest to be more effective in tests that are more aligned to the data encoded in the mnemonic. A performance-enhancing tool on the direct-recall questions might not have much impact on new cases or real-world professional activities. There should therefore be measures of retention and transfer in studies.

F. Potential Displacement of Stronger Strategies

There is extensive empirical evidence in support of retrieval practice and distributed practice in long-term learning [11], [14]. Mnemonics cannot substitute repeated retrieval, feedback, interleaving, application exercises or spaced revision and should be combined with them. In particular, Putnam contended that mnemonics should be considered as retrieval aids, but not as fundamental learning techniques [2], and retrieval-practice studies show that the active reconstruction of knowledge can result in long-term learning and in conceptual transfer [14].

GAPS IN THE CURRENT LITERATURE

There are a number of critical gaps that restrict solid conclusions regarding the efficacy of mnemonics in higher education.

First, most of the studies measure the performance on immediate or end-of-semester exams, and few measure retention six months or several years post-instruction. Whether mnemonics promote knowledge needed in final-year study, during clinical placement, professional examinations or employment is thus unclear.

Second, relatively few studies measure transfer to authentic performance. Better recall is not necessarily indicative of better clinical reasoning, laboratory performance, communication or professional decision-making,

despite the fact that the pharmacy study by Bruno and colleagues employed case-based questions, but real-world clinical outcomes were not analyzed [10].

Third, there is much methodological heterogeneity in the literature. The various types of mnemonics, learning materials, exposure times, control conditions and outcome measures are used in studies. An acronym, a method-of-loci intervention and an audiovisual story can work using various cognitive processes and cannot be considered similar interventions.

Fourth, most studies are based on self-reported use of mnemonics and student satisfaction. Students can experience the pleasure of a mnemonic, or think it works, without showing an improved delayed retention, and vice versa. Perception-based outcomes should be thus accompanied by objective learning measures.

Fifth, a lack of evidence comparing student and instructor-generated mnemonics exists. Mnemonics created by students can foster elaboration and ownership, but instructor-created mnemonics are more consistent and accurate; the relative effects of these two mnemonic types can also be influenced by the background knowledge and capacity to create meaningful associations in students.

Sixth, the cultural and linguistic relevance is seldom analyzed. Verbal associations and acronyms created in English might not be as significant to multilingual students and mnemonics that rely on humor, pronunciation, popular culture or culturally specific imagery might benefit certain students and disorient others.

Finally, the use of generative artificial intelligence to create personalized mnemonics remains underexplored. Artificial intelligence may rapidly produce culturally or personally meaningful stories, acronyms and images, but it may also generate inaccuracies, misleading associations, inappropriate language or excessive complexity. The educational effectiveness and safety of AI-generated mnemonics require empirical evaluation rather than assumptions based on technological novelty.

A PROPOSED AGENDA FOR FUTURE RESEARCH

A multicentre, mixed-method randomized controlled trial could provide stronger evidence regarding the effectiveness of mnemonics in higher education. Pharmacy or health-science students would be a suitable population, because their curricula require both factual retention and clinical application.

Proposed research question. Among undergraduate pharmacy students, what is the effect of instructor-generated and student-generated mnemonics, when combined with retrieval practice, on immediate learning, delayed retention, clinical application, cognitive load and learning anxiety?

Proposed design. Students from several universities could be allocated by tutorial group or class to one of three conditions: (1) a retrieval-practice group receiving conventional instruction followed by structured practice questions and feedback; (2) an instructor-generated mnemonic group receiving the same instruction and retrieval practice together with validated instructor-developed mnemonics; and (3) a student-generated mnemonic group receiving the same instruction and retrieval practice but guided to create, explain and peer-review their own mnemonics. An active control based on retrieval practice would be preferable to a passive no-intervention group, because it would establish whether mnemonics provide additional benefit beyond an already-effective strategy.

Proposed outcomes. The primary outcome could be delayed knowledge retention at eight weeks. Secondary outcomes could include immediate post-intervention performance; retention after six months; performance on direct-recall questions and on unfamiliar clinical cases; objective structured clinical or practical assessments; perceived cognitive load; learning and examination anxiety; confidence calibration; time spent studying; frequency of mnemonic use; the accuracy and quality of student-created mnemonics; and student experiences of usefulness, cultural relevance and difficulty.

The necessary sample size should be identified through a power analysis. Clustering could be considered with multilevel mixed-effects models with clustering based on university and tutorial group and prior academic performance, language background, baseline anxiety and previous familiarity with mnemonic strategies could

be explored as moderators. Qualitative interviews or focus groups would assist in clarifying the reasons why specific mnemonics were adopted, changed, rejected or forgotten and whether they were still used by the students during clinical placement. A study like this would fill in some of the recent limitations as it would compare methods of generating mnemonics, employ an active control, delayed results, and measure both retention and transfer.

IMPLICATIONS FOR HIGHER EDUCATION PRACTICE

Teachers who may wish to use mnemonics must first find out what they are going to teach that the difficulty of retrieving it is an actual obstacle. Mnemonics must be used to memorize only the most important facts, sequences, classifications or procedural structures and not used randomly. Each component of the mnemonics should be explicitly taught in its meaning. Students are to be allowed to access the information without looking at the mnemonic, to describe the connection between the elements and to use the information in new situations; the mnemonics are also to be retested after some time to practice long-term memory. Teachers' ought to engage students in the assessment or modification of mnemonics where it is feasible as student engagement can make them more relevant, but faculty supervision is still needed to avoid inaccuracy. Alternative versions may be needed in multilingual classes either verbal or visual. Above all, the evaluation should go beyond the capacity of students to repeat a mnemonic: students must also be able to show that they can interpret, apply, critique and go beyond the mnemonic when confronted with complex or extraordinary circumstances.

CONCLUSION

Mnemonics are still applicable as a learning tool in higher education, especially in the fields where students are required to memorize a lot of factual, sequential and procedural data. Statistical, medical, procedural learning and pharmacy education evidence demonstrates that mnemonics can enhance recall, structure decision-making, enhance confidence, perceived anxiety and, in certain situations, enhance applied performance. Their relevance is nonetheless conditional. Mnemonics cannot replace conceptual understanding, critical thinking, retrieval practice, feedback or authentic application, and poorly designed mnemonics may oversimplify knowledge, encourage rigid reasoning or add cognitive burden. The most appropriate educational model is therefore not "mnemonics versus deep learning" but mnemonics as one component of a broader, evidence-informed learning system. Future research should move beyond immediate examinations and student satisfaction: multicentre, longitudinal studies are needed to determine whether mnemonic-supported learning remains accessible over time and transfers to professional practice. Until such evidence is available, mnemonics should be used selectively, transparently and in combination with active retrieval and application-based learning.

Declarations

Ethical approval. This article is a review of previously published literature and did not involve human participants or animals; ethical approval was therefore not required.

Conflict of interest. The author declares no conflict of interest.

Data availability. No new data were generated or analysed in support of this review. All studies discussed are available from the cited published sources.

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