From Content Transmission to Deep Learning: Successful Teaching Strategies in Higher Education a Structured Integrative Review of the Evidence and a Proposed Pedagogical Model for University Teaching

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ABSTRACT

Higher education faces a growing tension between the expansion of knowledge, the increasing diversity of the student population, digitalisation, and the persistence of teaching models centred primarily on lectures. This paper examines which teaching strategies have sufficient evidence to be considered successful and under what conditions they promote deep, durable, self-regulated, inclusive, and transferable learning. A structured integrative review with a scoping-review orientation was conducted, drawing on meta-analyses, systematic reviews, influential empirical studies, and documents issued by international organisations that were available through open access or verifiable bibliographic records. Sources were organised according to study design, quality of evidence, outcomes examined, and implementation conditions. The findings show consistent support for active learning, retrieval practice, and spacing; favourable but more design-dependent evidence for problem-based learning, formative assessment, feedback, and the teaching of self-regulation; and a still-emerging evidence base for Universal Design for Learning and generative artificial intelligence when evaluated in terms of causal effects on learning. The paper argues that success does not reside in any single methodology, but in the articulation of five mechanisms: activation of prior knowledge, cognitive elaboration, distributed practice, action-oriented feedback, and transfer. An integrative model for designing university learning experiences is proposed, and its implications for academic development, curriculum, assessment, and the institutional governance of innovation are discussed.

Keywords: Higher Education; Teaching Strategies; Active Learning; Formative Assessment; Self-Regulated Learning; Artificial Intelligence; Integrative Review

INTRODUCTION

The quality of teaching in higher education has become a strategic concern. Universities must educate professionals who are able to understand complex problems, learn autonomously, collaborate, make well-founded decisions and transfer knowledge to rapidly changing contexts. However, the expansion of these expectations has not always been accompanied by an equivalent transformation in teaching practice. In many programmes, a transmission-based logic continues to predominate: the lecturer organises and explains content, while the student listens, records information and subsequently demonstrates mastery through assessment. Exposition can be valuable when it structures concepts, models reasoning or introduces a field; the problem arises when it becomes the almost exclusive learning experience.

Contemporary research requires the question to shift from which methodology appears most innovative to what intellectual actions students undertake and what evidence supports the claim that those actions produce learning. In a meta-analysis of 225 studies in STEM disciplines, Freeman et al. (2014) found better outcomes and lower failure rates in courses using active learning than in traditional lecture-based classes. Subsequently, Theobald et al. (2020) showed that active learning can reduce attainment gaps for historically under-represented students, although its effects depend on the intensity and quality of implementation. These studies do not invalidate all lecturer explanation, but they do challenge the sufficiency of teaching in which students participate mainly as recipients.

Alongside active learning, cognitive psychology has accumulated evidence on retrieval practice, spacing and interleaving. Roediger and Karpicke (2006) demonstrated that attempting to retrieve information strengthens long-term retention, even when additional rereading initially produces a greater sense of mastery. In reviewing classroom experiments, Agarwal, Nunes and Blunt (2021) observed benefits of retrieval across different levels and subject areas, while noting a strong concentration of studies in Western countries. In health professions education, Trumble et al. (2024) found favourable results in most experiments on distributed practice and retrieval, together with considerable methodological heterogeneity.

Another highly influential field is formative assessment. Hattie and Timperley (2007) argued that feedback can make an important contribution to learning when it clarifies the goal, provides information about performance and guides the next steps. Nicol and Macfarlane-Dick (2006) linked effective feedback to the development of self-regulation, while Boud and Molloy (2013) proposed moving beyond a model in which information is transmitted by the lecturer and designing systems in which students actively use feedback. Nevertheless, Morris, Perry and Wardle (2021) demonstrated that specific causal evidence in higher education is less abundant than the extensive conceptual literature might suggest. This finding is methodologically important: a practice that is plausible, widely recommended or valued by students cannot automatically be regarded as effective.

The emergence of generative artificial intelligence intensifies this challenge. Such tools can produce explanations, examples, quizzes, simulations and immediate feedback, but they can also replace cognitive processes that students should undertake themselves. UNESCO (Miao & Holmes, 2023) advocates a human-centred approach that preserves agency, equity, privacy and pedagogical purpose. Lan and Zhou's (2025) review of AI and self-regulated learning in higher education identified only fourteen empirical studies, confirming that technological enthusiasm still exceeds the maturity of the evidence.

This article addresses the following question: which teaching strategies have evidence of effectiveness in higher education, and under what conditions do they contribute to deep learning, cognitive engagement, self-regulation, inclusion and transfer? Its purpose is to synthesise the evidence critically, distinguish degrees of support, identify shared mechanisms and propose an integrative model applicable to university teaching design. The central thesis is that a strategy is successful not because of its label, novelty or level of digitalisation, but because it intentionally organises cognitive activities that enable learners to retrieve, elaborate, apply, review and transfer knowledge.

Conceptual Framework: What Successful Teaching Means

Defining successful teaching requires avoiding two common reductions. The first is to equate success with satisfaction. Student perception is a relevant source of information about clarity, support, workload or belonging, but it does not in itself constitute evidence of learning. The second is to identify success exclusively with immediate marks, which may reflect short-term memorisation, familiarity or close alignment with a particular test. A more robust conception should consider at least five outcomes: conceptual understanding, retention, transfer, self-regulation and equity.

Biggs and Tang (2011) formulated the principle of constructive alignment: learning outcomes, activities and assessment should require coherent intellectual operations. If the intended outcome is to analyse or solve, a sequence based solely on listening and remembering is misaligned. Through the ICAP framework, Chi and Wylie (2014) distinguished passive, active, constructive and interactive modes of engagement. Their contribution is particularly useful because it shows that not every visible activity produces the same degree of cognitive engagement. Underlining, responding mechanically or moving objects may be active in a behavioural sense, but explaining, generating inferences, comparing alternatives or constructing a solution involves greater elaboration.

From this perspective, deep learning is not defined by the apparent difficulty of a task, but by the meaningful reorganisation of knowledge. It requires connecting new material with prior knowledge, distinguishing relevant features, explaining causal relationships and using concepts in different situations. Transfer is a demanding test: students must recognise when and how to use what they have learnt outside the format in which it was taught. This explains why a strategy may improve performance on an immediate test without necessarily improving far transfer.

Self-regulation adds a temporal and strategic dimension. Zimmerman (2002) describes it as a cyclical process involving planning, performance, monitoring and self-reflection. In comparing six models, Panadero (2017) emphasises that self-regulation integrates cognitive, metacognitive, motivational, behavioural and emotional components. It is therefore not enough to ask students to be autonomous: autonomy must be taught through clear goals, modelling, opportunities for choice, monitoring and reflection on strategies.

Finally, successful teaching must take account of learner variability. Universal Design for Learning proposes anticipating barriers and providing multiple means of engagement, representation, action and expression. The CAST 3.0 Guidelines (CAST, 2024) broaden the focus to include identity, belonging, interdependence and systemic barriers. It is nevertheless important to distinguish the usefulness of the framework for designing inclusive environments from the causal evidence available for each application. The conceptual value of an approach does not remove the need to evaluate its effects.

METHODOLOGY

A structured integrative review informed by a scoping-review approach was undertaken. This design was selected because the object of study encompasses heterogeneous interventions, diverse outcomes and sources of different kinds. A systematic review focused on a single intervention would have allowed a more precise estimate of a specific effect, but would not have adequately addressed a broad question concerning families of strategies and pedagogical mechanisms. The scoping orientation drew on the recommendations of Arksey and O'Malley (2005), Levac, Colquhoun and O'Brien (2010), Peters et al. (2020), and the PRISMA-ScR extension developed by Tricco et al. (2018). The review question, source families, eligibility principles, extraction fields and evidence categories were defined to support a structured comparison; however, the review was not prospectively registered and should not be interpreted as a fully exhaustive systematic review.

The search was organised into six families: active learning; problem- and case-based learning; retrieval and distributed practice; formative assessment and feedback; metacognition and self-regulation; and inclusion, Universal Design for Learning and artificial intelligence. Priority was given to publications from 2014 to July 2026, while earlier works were included when they were foundational or continued to shape the field. Records and texts accessible through ERIC, PubMed/PMC, SpringerLink, Wiley Online Library, Frontiers, PNAS, UNESCO, OECD, CAST and the PRISMA portal were consulted. Google Scholar and reference tracking were used as complementary procedures for locating sources, rather than as the sole basis for selection. Searches combined the higher-education context with the name of the strategy or mechanism and at least one outcome or evidence-design term. Because the search was conducted across platforms with different interfaces and access conditions, exact strings were adapted to each source rather than applied as one identical query.

Search combinations included terms equivalent to higher education, university, teaching strategies, active learning, problem-based learning, retrieval practice, spacing, formative assessment, feedback, self-regulated learning, universal design for learning, generative AI, achievement, retention, transfer, equity and systematic review. Eligibility was determined by four elements. First, the context had to concern higher education or provide evidence with a clear bearing on university teaching. Second, the source had to examine an identifiable teaching strategy, learning mechanism or institutional design framework. Third, it had to report learning-related outcomes, implementation conditions or a transparent conceptual or methodological contribution. Fourth, the publication had to have identifiable authorship and a verifiable methodological or institutional basis. Meta-analyses, systematic reviews, experimental or quasi-experimental studies, highly influential conceptual reviews and institutional documents meeting these conditions were included. Purely promotional texts, accounts lacking a methodological description, studies in which satisfaction was the only outcome, and publications attributing effects to a technology without describing the pedagogical activity were excluded.

Information was extracted into a matrix comprising reference, context, discipline, strategy, proposed mechanism, design, participants, outcomes, implementation conditions, limitations and accessibility. The appraisal considered the study design, breadth and consistency of the evidence, directness of the learning outcomes, sample and contextual limitations, and the extent to which implementation was described. On that basis, evidence was interpreted through four categories: established evidence, where consistent meta-analyses or reviews based on multiple studies were available; moderate evidence, where results were favourable but heterogeneous or context-dependent; emerging evidence, where small samples, exploratory designs or recent technologies predominated; and conceptual support, where models or guidelines lacked direct causal testing. These categories were used to calibrate the strength of claims rather than to calculate a formal risk-of-bias score.

The selection and appraisal procedures were undertaken by the author and were documented through the extraction matrix, source verification and the four-level evidence classification. The review does not claim bibliometric exhaustiveness: exact record counts, duplicate-removal totals and a PRISMA flow diagram were not retained, and no second reviewer independently screened or appraised the sources. Its purpose is to produce a transparent academic synthesis, useful for an international seminar and based on verifiable and accessible sources. A version intended for a scientific journal would require protocol registration, reproducible database-specific search strings, comprehensive searches in subscription databases, reporting of the number of records at each stage and formal risk-of-bias assessment by at least two reviewers.

As complementary support for the search process, generative artificial intelligence was used to expand combinations of terms, identify potentially relevant references, organise records provisionally and detect thematic relationships among authors and research strands. Its use did not replace consultation of the original sources or academic appraisal of the material. Every reference ultimately included was checked through its DOI, publisher record or accessible full text; likewise, decisions on inclusion, interpretation of findings, classification of the evidence and final drafting remained the responsibility of the author. This statement is intended to make the use of the tool transparent and to safeguard the principles of traceability, verifiability and academic authorship.

RESULTS

Active Learning: Robust Support, Dependent on Implementation

Active learning is the family of approaches supported by the most consistent evidence. Prince (2004) defined it broadly as methods that involve students in meaningful activities and reflection on what they are doing. In his words, it includes “any instructional method that engages students in the learning process” (p. 223, author’s translation). This breadth explains both part of its strength and part of its ambiguity. Freeman et al. (2014) analysed 225 studies in STEM and found that active learning improved examination performance and reduced failure compared with traditional lecturing. The effect appeared across disciplines, class sizes and levels, although it was particularly visible in smaller classes.

In direct terms, Freeman et al. (2014) conclude that “students in classes with traditional lecturing were 1.5 times more likely to fail” than those participating in active learning (p. 8410, author’s translation).

Theobald et al. (2020) extended the analysis to equity. Their meta-analysis showed that active learning reduced achievement and pass-rate gaps for students from under-represented groups, particularly when interventions were intensive. The authors report that “active learning reduced achievement gaps in examination performance by 33%” (p. 6476, author’s translation). This finding suggests that a methodology is not inclusive merely because it incorporates group work: it requires frequent opportunities to think, make mistakes, receive support and try again.

Chi and Wylie (2014) help to interpret the mechanism. Their hypothesis holds that, as engagement progresses from passive to active, constructive and interactive modes, “learning will increase” (p. 219, author’s translation). The most effective activities are not necessarily the most entertaining, but those that lead students to generate explanations, defend decisions, construct representations or negotiate meaning. Lecturing can be integrated into short cycles of explanation, questioning, discussion, application and feedback. The relevant contrast is not between speaking and not speaking, but between a class that keeps the student in the role of recipient and one that requires the student to process knowledge.

Problems, Cases and Authentic Tasks

Problem-based learning (PBL) seeks to organise learning around complex, generally open-ended situations that require students to identify information needs, integrate knowledge and justify decisions. In a meta-analysis of tertiary education, Dochy et al. (2003) found robust positive effects on skills, while outcomes for knowledge were more variable. In a review for the OECD, Hoidn and Kärkkäinen (2014) concluded that PBL may foster certain innovation skills, but emphasised the concentration of studies in medicine and the need for further research.

These findings support a balanced position. Problems and cases are particularly relevant to transfer, professional reasoning and collaboration, but they do not automatically replace explicit instruction or guarantee conceptual mastery. Their effectiveness increases when the problem is aligned with the outcomes, students have sufficient prior knowledge, the lecturer provides scaffolding and assessment values reasoning as well as the final answer. For novices, excessively open-ended problems can increase cognitive load and lead to superficial searching. Design should therefore calibrate complexity and support.

Retrieval, Spacing and Interleaving

Retrieval practice involves attempting to recall or reconstruct information without having it available. Roediger and Karpicke (2006) showed that retrieval tests could produce lower immediate performance than repeated study, but superior retention several days later. The phenomenon challenges confidence based on fluency: rereading creates familiarity, whereas retrieval makes visible what is actually available in memory. In summary, “testing is a powerful means of improving learning, not just assessing it” (p. 249, author’s translation).

Agarwal et al. (2021) reviewed 50 applied experiments and reported consistent benefits across levels, content areas and formats. In their synthesis, “the majority (57%) revealed medium or large benefits” (p. 1409, author’s translation). Trumble et al. (2024) identified 56 articles and 63 experiments in health professions education; 43 showed significant benefits from retrieval, distribution, or both. The results, however, depend on feedback, the quality of questions, the interval between practice opportunities and alignment with the final assessment. Retrieval practice does not mean multiplying punitive tests. It can take the form of opening questions, low-stakes quizzes, explanation without notes, reconstructed maps or cumulative problems.

Spacing distributes learning opportunities over time. Its pedagogical value lies in counteracting massed study and requiring learners to reactivate partially forgotten knowledge. Interleaving mixes categories or types of problem, supporting discrimination about when to apply a procedure. Taken together, these strategies suggest that a successful curriculum should not teach, assess and then abandon each unit, but should revisit central ideas at increasing intervals.

Formative Assessment and Feedback

Black and Wiliam (1998) made a decisive contribution to understanding formative assessment as the use of evidence to adapt teaching and learning: assessment becomes formative when “the evidence is actually used to adapt the teaching work” (p. 7, author’s translation). In higher education, Nicol and Macfarlane-Dick (2006) proposed principles aimed at developing self-regulation. Hattie and Timperley (2007) caution that “feedback is one of the most powerful influences on learning and achievement” (p. 81, author’s translation), organising it around three questions: where am I going, how am I going, and where to next? Boud and Molloy (2013) insisted on designing systems in which students develop the capacity to seek, interpret and use information about their performance.

This conception shifts the student from a receptive position to an active role: “students are already assessing their own work and generating their own feedback” (Nicol & Macfarlane-Dick, 2006, p. 200, author’s translation).

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The review by Morris et al. (2021) introduces an essential note of caution. Following an extensive search, the authors found a limited set of studies with robust causal evidence and state that there is "very little evidence to support effective feedback practices in higher education" (p. 1, author's translation). Low-stakes quizzes emerged as a particularly promising practice; benefits were also observed for some forms of peer and lecturer feedback, but with a strong dependence on implementation. Praise, grading and technology-mediated feedback produced mixed results.

The implication is that feedback should not be evaluated by its quantity, speed or length, but by its capacity to prompt subsequent action. Comments are of little use when they arrive at the end, are generic, focus on correcting the product or offer no opportunity for revision. An effective formative architecture includes clear criteria, exemplars of quality, practice tasks, specific information, time for interpretation and a new performance in which students can apply what they have learnt.

Metacognition and Self-Regulated Learning

Self-regulation is not an isolated technique, but a set of processes through which students establish goals, select strategies, monitor understanding, regulate effort and evaluate outcomes. Zimmerman (2002) proposes phases of forethought, performance and self-reflection. Panadero (2017) shows that the principal models agree on the cyclical nature of the process, although they differ in the weight assigned to motivation, emotion, context and shared regulation.

Zimmerman (2002) emphasises that self-regulated learners are "metacognitively, motivationally and behaviourally active participants in their own learning process" (p. 65, author's translation).

In higher education, teaching self-regulation involves making expert reasoning visible. Lecturers can model how to interpret an assignment, plan a solution, check an answer and decide to change strategy. Learning journals, error-analysis protocols, criterion-referenced self-assessment, study plans and post-assessment reflections are useful when integrated into authentic tasks. Asking for a generic reflection at the end of a course has less potential than embedding planning, monitoring and revision within each performance cycle.

Metacognition also helps to correct illusions of learning. Students often overestimate what they have learnt when an explanation is understood while it is present. Retrieval and self-explanation provide more valid information about mastery. Thus, self-regulation, retrieval practice and formative assessment are not separate strands, but components of the same system.

Inclusion and Universal Design for Learning

Universal Design for Learning proposes designing from the outset for variability, rather than making late adaptations for an average student who does not exist. CAST (2024) organises the framework around multiple means of engagement, representation and action and expression, with the aim of strengthening learner agency. Version 3.0 explicitly incorporates identity, belonging, interdependence and the reduction of barriers associated with bias and systems of exclusion.

CAST (2024) summarises the purpose of the framework as the development of intentional and reflective learner agency, capable of mobilising resources, acting authentically and directing decisions strategically. This formulation extends UDL from the accessibility of materials towards participation, identity, belonging and students' capacity to direct their own learning.

Its main contribution to the subject of this article is to remind us that a strategy may produce a favourable average effect while simultaneously excluding particular groups. Ambiguous instructions, inaccessible materials, a single mode of participation or assessments that add irrelevant barriers may prevent students from demonstrating learning. Applying UDL does not mean lowering expectations or offering unlimited options; it means maintaining intellectually rigorous goals while diversifying appropriate support and routes for achieving them.

The evidence on UDL is more heterogeneous than that available for active learning or retrieval. A substantial proportion consists of foundations from the learning sciences, accessibility studies and implementation experiences. It should therefore be presented as a conceptually supported design framework with a growing empirical base, rather than as a single intervention with a generalisable effect size.

Generative Artificial Intelligence: Conditional Potential and Emerging Evidence

Generative AI can support the creation of cases, the formulation of questions, the simulation of professional conversations, translation, preliminary feedback and the adaptation of examples. None of these functions, however, guarantees learning. The effect depends on the intellectual activity that remains the student's responsibility. When the tool produces the explanation, argument and final solution, it may reduce practice in precisely the capabilities that education is intended to develop.

Miao and Holmes (2023) propose that adoption should be ethical, safe, equitable and centred on human agency. Warning of the risk of dependence, they state that AI "must not be allowed to usurp human thinking" (p. 24, author's translation). In a systematic review of AI and self-regulation, Lan and Zhou (2025) identified fourteen empirical studies using chatbots, adaptive systems, games and electronic books. The results suggest possibilities for feedback, planning and personalised support, but the evidence base remains limited and heterogeneous.

AI should be incorporated as cognitive scaffolding and as an object of critical judgement. Pedagogically defensible uses include comparing a human response with a generated one, detecting errors and biases, requesting Socratic questions without receiving the solution, reviewing a draft and justifying which suggestions to accept, or simulating opposing positions. The institutional question is not only how to permit or prohibit tools, but what evidence of the intellectual process assessment needs to preserve.

Discussion: Shared Principles and Conditions for Success

Comparison across strategies makes it possible to identify mechanisms that are more stable than methodological labels. The first is activation: new learning is built on prior knowledge that must be retrieved and made visible. The second is elaboration: understanding requires explaining, relating, comparing, arguing and generating inferences. The third is distributed practice: knowledge must be used again at different points rather than being concentrated within a single unit. The fourth is action-oriented feedback: information becomes formative only when it modifies subsequent performance. The fifth is transfer: tasks must vary contexts and require students to decide which knowledge is relevant.

These five mechanisms explain why different strategies may work and why the same label may produce opposite outcomes. An authentic case may promote transfer or become a superficial discussion. A quiz may strengthen retrieval or encourage fragmented memorisation. Group work may generate constructive interaction or allow some students to remain passive. An AI tool may extend reflection or replace it.

The evidence therefore recommends looking beyond the name of a methodology. As Chi and Wylie (2014) argue, effectiveness depends on the mode of cognitive engagement triggered by the activity, from passive through to interactive.

Implementation also depends on four conditions. First, alignment among outcomes, activities and assessment. Second, sufficient intensity: occasional interventions are unlikely to transform habits. Third, progressive scaffolding according to prior knowledge. Fourth, a climate of academic safety that allows mistakes without disproportionate penalties. These conditions are not independent of context. Class size can affect the feasibility and intensity of interaction; digital infrastructure can enable or constrain retrieval, feedback and AI-supported activities; cultural expectations can shape participation, authority and collaboration; and institutional support can determine whether redesign is sustained. Equity is therefore not an automatic effect: it requires attention to who participates, who receives feedback, what barriers the task introduces and which groups benefit.

On the basis of these findings, the AEPFT model is proposed: Activation, Elaboration, Practice, Feedback and Transfer. The cycle begins with a situation or question that activates prior knowledge; continues with a brief explanation or resource that organises concepts; requires a product that promotes elaboration; distributes opportunities for practice and retrieval; provides usable feedback; and culminates in a new task demanding transfer. Metacognition runs through the cycle via planning, monitoring and reflection. Inclusion serves as a design criterion and technology as a resource subordinate to purpose.

This model avoids a false choice between direct instruction and active methodologies. Lecturer explanation is useful when it reduces complexity, models thinking and prepares students for performance. Student activity is indispensable for transforming information into available knowledge. The challenge is to combine both within a sequence that makes learning visible and enables it to be regulated.

Implications for Institutions and Lecturers

Improving teaching cannot rest exclusively on individual initiative. Institutions must provide sustained academic development, time to redesign modules, support for evaluating innovations and communities of practice. The OECD (2010) has emphasised that teaching quality requires institutional approaches that articulate leadership, culture, evaluation and academic participation. Isolated innovation often disappears when it depends on one person or temporary funding.

At curriculum level, it is advisable to identify essential concepts and performances, distribute their practice throughout the programme and review coherence across modules. Assessment should include formative opportunities and transfer tasks, rather than merely accumulating final examinations. Learning data should be used to improve design, while avoiding turning analytics and dashboards into surveillance mechanisms.

In relation to AI, institutions need agreements that distinguish legitimate uses, uses requiring declaration, and uses incompatible with the assessed outcome. They must also guarantee privacy, equitable access and critical literacy. Academic development should begin with learning design, not catalogues of tools.

For the lecturer, a realistic route is to redesign one unit before attempting to transform the entire course. The lecturer can select a central learning outcome, formulate a transfer task, identify prior knowledge, alternate explanation and activity, incorporate cumulative retrieval and design a concrete opportunity to use feedback. Quality will come from the coherence of the cycle and the evidence gathered, not from the quantity of resources.

The proposed AEPFT model should therefore be treated as a theoretically grounded design framework requiring direct empirical evaluation. Comparative and longitudinal studies could test the complete cycle and its individual components across disciplines, institutional types and student populations. Mixed-methods designs would be particularly valuable for establishing not only whether outcomes improve, but also how implementation varies with class size, available technology, cultural expectations, staff development, assessment policy and organisational support.

Limitations

This review integrates highly influential sources with verifiable access, but it does not constitute an exhaustive systematic review. Its conclusions depend on the quality, availability and accessibility of the existing literature. The breadth of the subject generates heterogeneity across disciplines, outcomes, learner groups, institutional settings and research designs, making it difficult to determine whether an average finding applies unchanged to a particular field or population. A substantial proportion of the evidence on active learning comes from STEM and high-income countries, limiting its direct generalisation to other contexts. Studies of formative assessment use diverse definitions and frequently small samples. Evidence on UDL and generative AI is evolving rapidly and combines conceptual frameworks with studies that remain at an early stage; consequently, the paper treats these areas as promising and design-relevant, but does not claim mature or uniform causal effects.

The classification of evidence was interpretative and undertaken by one author for this synthesis. The search did not retain the complete record counts needed for a reproducible flow diagram, did not include comprehensive subscription-database searches, and did not apply duplicate independent screening or a formal risk-of-bias instrument. A subsequent scientific publication should register a protocol, report database-specific search strings and dates, incorporate comprehensive searches in Scopus and Web of Science, apply independent quality assessment and present a complete matrix of included studies. Future research should also undertake empirical evaluations of the AEPFT model across disciplines, institutions and diverse student populations, using outcomes that include retention, transfer, self-regulation and equity. Such studies should examine how effects interact with class size, digital infrastructure, cultural differences, prior knowledge and institutional support. These limitations do not invalidate the general conclusions, but they require conditional recommendations and caution against universal claims.

CONCLUSIONS

The evidence reviewed supports the conclusion that successful teaching in higher education requires moving beyond the identification of teaching with exposition, without falling into a simplistic devaluation of lecturer explanation. Exposition retains an important function when it organises concepts, models procedures, reduces complexity or prepares students for subsequent performance; it loses effectiveness when it becomes the dominant experience and does not require learners to retrieve, elaborate, apply or transfer what they have learnt. In this respect, active learning has the strongest empirical support, particularly when it promotes cognitive elaboration and meaningful interaction. Retrieval practice and spacing provide sound mechanisms for strengthening retention; problems, cases and authentic tasks foster skills and transfer when they incorporate sufficient prior knowledge and progressive scaffolding; and formative assessment gains value when feedback can be used in a new performance.

The findings also require differentiated recommendations according to the strength of the evidence. Self-regulation should not be assumed to be a pre-existing student disposition, but should be taught explicitly through goals, modelling, monitoring, self-assessment and reflection integrated into tasks. Universal Design for Learning provides a relevant framework for anticipating barriers and responding to learner variability, although its applications must be evaluated precisely and without attributing a single causal effect to the approach as a whole. Likewise, generative artificial intelligence offers possibilities for producing examples, questions, simulations and preliminary feedback, but its contribution depends on strengthening, rather than replacing, the intellectual activity to be developed. Technological innovation is pedagogically defensible only when it preserves agency, requires critical judgement and allows the authorship of the learning process to be recognised.

The principal contribution of this review is to shift attention from methodological labels to the mechanisms that make learning possible. The AEPFT model synthesises five of them: activation of prior knowledge, elaboration, distributed practice, action-oriented feedback and transfer. These mechanisms do not constitute a rigid sequence or a new closed methodology, but criteria for analysing and designing learning experiences. They make it possible to understand why different strategies can produce similar results and why the same strategy may be effective in one context and ineffective in another. Their value lies in offering a common language for articulating teaching, curriculum and assessment, making visible what students must do cognitively, what evidence allows their progress to be observed and what support they need in order to participate in intellectually demanding tasks.

From an institutional perspective, improving teaching requires more than promoting novel methodologies or incorporating digital tools. It entails creating conditions for sustained academic development, collaborative redesign of modules, coherence across courses, evaluation of innovations and responsible use of evidence. It also requires recognition that equity does not arise automatically: institutions must examine who participates, who progresses, what barriers design introduces and which groups benefit or fall behind. The future challenge is therefore not to choose between lecturing and active learning, tradition and innovation, or human and artificial intelligence. It is to construct coherent sequences of explanation, performance, evidence, feedback and transfer that enable diverse students to understand, remember, self-regulate and use knowledge in new situations. Here lies the difference between visible innovation and effective transformation of university learning.

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