



The Case for Cases: From Compelling Stories to Responsible Reasoning and Adaptive Learning

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ABSTRACT: Examples, stories, and cases connect abstract propositions with situations, yet their pedagogical usefulness does not establish their evidentiary adequacy. This conceptual article examines how case-based learning can support understanding, responsible judgment, and adaptive knowledge use without allowing memorable narratives to substitute for warranted inference. Building on an originating essay about the value of examples, the analysis integrates selected scholarship on case-based reasoning, worked examples, analogical comparison, narrative persuasion, epistemic cognition, and Cognitive Flexibility Theory. The methodology consists of purposive literature selection, conceptual differentiation, comparison of explanatory mechanisms, examination of boundary conditions, and development of an integrative instructional framework; it is neither a systematic review nor an empirical intervention study. The conceptual results distinguish five functions of cases: illustration, epistemic testing, engagement, relational comparison, and adaptive reconstruction. They also identify six connected design requirements: specifying instructional purpose, establishing provenance, selecting meaningful contrasts, scaffolding interpretation, assessing transfer, and recalibrating claims. Four propositions specify testable relationships among case diversity, comparative activity, evidentiary transparency, prior knowledge, and transfer performance. The discussion addresses the tension between simplifying instruction and preserving contextual complexity, the ethical consequences of narrative selection, and the evaluation of digital case libraries. The article argues that instructional value depends less on accumulating compelling stories than on coordinating the purposes, evidence, comparisons, and assessments through which learners encounter them. Its contribution is an alignment between learning from cases and reasoning responsibly about what cases establish, together with a research agenda for evaluating that alignment across educational and professional settings through future empirical inquiry.

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case-based learning; cognitive flexibility; analogical reasoning; knowledge transfer; narrative persuasion; epistemic cognition; conceptual research

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1. INTRODUCTION

Examples occupy a distinctive position between knowing what a proposition means and knowing whether that proposition warrants acceptance. A description of successful practice can make an unfamiliar idea intelligible, while an unsuccessful case can reveal a limitation concealed by an elegant explanation. These functions are valuable, but they are not interchangeable: understanding a claim, believing it, and possessing adequate grounds for belief represent different accomplishments. An instructional story can improve the first while leaving the third unchanged, and its persuasive force can sometimes obscure that difference. Scholarship on narrative communication and case-study reasoning therefore provides complementary reasons to take cases seriously without granting them automatic authority (Dahlstrom, 2014; Flyvbjerg, 2006). The central problem is not whether

educators should use examples, but how they should specify the intellectual work examples are expected to perform. This article develops a conditional case for cases, one that connects their educational potential with explicit requirements for interpretation, comparison, and evidentiary restraint. It treats cases as resources for disciplined inquiry rather than as substitutes for argument or guarantees of practical success. The resulting framework addresses both learning from particular situations and judging what those situations can legitimately establish.

The immediate point of departure is an unpublished essay that presents examples, stories, and cases as a bridge between theory and practice (Elassad, n.d.). That essay organizes its argument around the challenge of producing a concrete example, the explanatory and emotional force of stories, and the value of multiple cases for responding to unfamiliar problems. Its business testimonials and accessible analogies express a practical concern: abstract recommendations often leave their audiences uncertain about what implementation would actually involve. The present article preserves that concern while differentiating the evidentiary status of the materials through which it is expressed. Testimonials in the originating essay are not treated as verified organizational outcomes, and reported improvements are not converted into research findings. Instead, the essay supplies a problem formulation that can be examined through established scholarship and extended through explicit conceptual argument. Its emphasis on Cognitive Flexibility Theory is retained because that theory directly addresses knowledge application under contextual variability (Spiro et al., 1988). However, its broad use of the word case is refined so that pedagogical illustration does not become confused with empirical investigation. The purpose is development of the argument, not retrospective certification of every example used to introduce it.

A request for an example can expose ambiguity, but its diagnostic value depends on the kind of claim being evaluated. When a speaker asserts that an intervention has already succeeded, a request for a documented instance is directly relevant to the assertion. When a speaker proposes an unprecedented intervention, absence of precedent instead identifies uncertainty about implementation; it does not logically establish impossibility. Similarly, a single instance can refute a genuinely universal claim when it satisfies the relevant definitions, but it cannot by itself establish how frequently an outcome occurs. These distinctions explain why indiscriminate demands for cases can produce either warranted scrutiny or misplaced conservatism. They also show why educators should teach the interpretation of examples alongside the production of them. An illustrative scenario may demonstrate conceptual coherence, whereas a documented case may provide evidence of occurrence and a research design may support more specific causal or explanatory conclusions. The argument must therefore connect the properties of a case with the inference being drawn, rather than assuming that concreteness supplies its own warrant. Such alignment complements the attention to aims, justification, and reliable inquiry emphasized in epistemic cognition research (Chinn et al., 2011).

Three questions organize the analysis: What distinct functions do cases perform, under what conditions can those functions support adaptive learning, and how can instruction prevent pedagogical effectiveness from being mistaken for evidentiary sufficiency? Addressing these questions requires comparison across traditions that operate at different explanatory levels. Case-based reasoning concerns the use and adaptation of prior experience; example-based instruction concerns how learners process representations; and Cognitive Flexibility Theory concerns knowledge use in complex, variable situations (Kolodner, 1992; Renkl, 2014; Spiro et al., 1991). Narrative persuasion and epistemic cognition add questions about engagement, acceptance, and standards of justification. The contribution proposed here is not the discovery that multiple examples or contextual variation matter, since those claims already have substantial theoretical histories. Rather, it is an instructional synthesis that makes the relationship between a case's learning function and its evidentiary function explicit. The article first reviews the relevant conceptual resources, then explains the analytic procedure used to integrate them. Its results comprise distinctions, design requirements, and propositions, rather than measurements of participants or estimates of intervention effects. The discussion develops educational implications and an empirical agenda while identifying the limits of what this conceptual analysis establishes.

2. LITERATURE REVIEW

2.1 Cases, Examples, and the Scope of Evidentiary Claims

Terminological precision is necessary because several materials described as cases have different purposes and different relationships to observation. For this analysis, an example is a particular instance used to clarify a category, relationship, or procedure. A narrative organizes events into a meaningful sequence, while an anecdote ordinarily offers a relatively brief account whose documentation may vary. A teaching case presents a situation for interpretation or decision, and its instructional usefulness can depend on deliberate selection or construction. An empirical case study, by contrast, makes claims about a bounded phenomenon through an articulated process of investigation and analysis. Flyvbjerg (2006) challenges categorical dismissal of case studies and emphasizes the significance of context-dependent knowledge, but this position does not license treating every story as methodologically equivalent. The distinctions adopted here concern how a representation is produced and used, not whether its prose is vivid or its subject matter appears practical. A fictional teaching case can legitimately support conceptual exploration when its status is disclosed, whereas a factual anecdote can remain inadequate for a causal conclusion. Accordingly, the term case functions as an inclusive category only when the more specific status of each instance remains visible.

The evidentiary contribution of a case is claim-relative rather than determined solely by its size, detail, or emotional impact. A verified occurrence can establish that an event happened under particular conditions, even when it cannot establish the event's population frequency. A carefully investigated process may illuminate a mechanism, but the transferability of that mechanism requires attention to the conditions under which it operated. A constructed counterexample can challenge the consistency of a conceptual rule without demonstrating that the imagined circumstances have occurred. These differences are not defects to be eliminated through a single hierarchy of cases; they are distinctions to be incorporated into interpretation. The framework developed here therefore separates provenance, inferential purpose, and scope of application. Provenance concerns the origin and documentation of the material, inferential purpose concerns what it is being used to establish, and scope concerns the circumstances to which the conclusion extends. This separation provides an analytic way to retain the educational value of stories without exaggerating their empirical force. It also makes visible a recurrent instructional risk: a learner may correctly remember what happened in a case while incorrectly assuming that the same explanation applies everywhere.

2.2 Case-Based Reasoning and Learning From Examples

Case-based reasoning provides an account of how prior situations can become resources for addressing present problems. Kolodner (1992) describes reasoning that adapts previous solutions, uses earlier cases to explain unfamiliar situations, and employs precedents to evaluate proposed responses. The relevant intellectual operation is not simple repetition, because a remembered solution must be related to the demands of a new problem. This perspective makes the organization and accessibility of experience important, rather than treating experience as an undifferentiated accumulation of events. It also suggests that unsuccessful cases can have instructional value when they clarify conditions that constrain a solution. For the present synthesis, the implication is that a case library should record rationales and limitations as well as actions and outcomes. A repository consisting only of successful endpoints would provide less support for reconstructing the judgments that produced them. The educational translation nevertheless remains an inference: computational or theoretical accounts of case-based reasoning do not establish the effectiveness of every classroom activity labeled case-based. Instructional effectiveness requires attention to what learners notice, retrieve, compare, and revise when they encounter the material.

Research on worked examples narrows the question by examining representations that show how a problem can be solved. Sweller and Cooper (1985) investigated worked examples in algebra learning, providing an important empirical basis for distinguishing learning through studying solutions from learning through independently searching for them. This literature does not imply that a fully narrated solution should always replace student reasoning. Renkl (2014) integrates work on examples, observational learning, and analogy to explain why instructional design must support relevant processing rather than merely make examples available. A worked example can direct attention toward relationships that an inexperienced learner would otherwise overlook, while a poorly used example can invite unreflective imitation. The issue is therefore not whether a case includes a solution, but how the learner is asked to understand and evaluate that solution. A decision case without an answer may be appropriate for advanced judgment, whereas a carefully explained example may be more appropriate for initial access to a procedure. These possibilities need not compete when instructional sequencing acknowledges differences in learning objectives and prior knowledge. The present framework accordingly treats the degree of solution disclosure as a design variable rather than a defining virtue of case-based pedagogy.

2.3 Analogical Comparison and the Identification of Relevant Structure

Analogical reasoning helps explain how a case can inform understanding beyond its original setting. Gentner's (1983) structure-mapping account distinguishes relational correspondence from superficial resemblance, making the organization of relationships central to analogical interpretation. Two situations can share relevant structure despite differences in their visible features, while superficially similar situations can depend on different causal arrangements. Gick and Holyoak (1983) examine schema induction and analogical transfer, directing attention to the conditions under which experience with examples supports a subsequent problem. These contributions make comparison an intellectual activity rather than a matter of noticing that two stories sound alike. For instructional purposes, learners should identify which relationships support the analogy and which features should not be transferred. They should also consider whether an apparently shared relationship has the same significance in both settings. This requirement is particularly important when professional anecdotes travel between industries or educational practices travel between institutions. The relevant question is not simply whether another organization experienced success, but whether its pattern of constraints and resources meaningfully corresponds to the situation under consideration.

Comparing cases can be more educationally productive than presenting them as independent demonstrations. Gentner et al. (2003) investigated analogical encoding, in which learners compared examples to identify relational structure and subsequently applied that understanding to additional problems. Schwartz and Bransford (1998) examined how analysis of contrasting cases can prepare learners to understand subsequent explanations, rather than positioning explanation and exploration as mutually exclusive approaches. Together, these studies motivate a distinction between case quantity and comparative organization. Several stories placed sequentially in a lesson do not necessarily produce the noticing that a carefully designed comparison invites. The proposed synthesis therefore treats similarities and differences as instructional targets that must be made available for analysis. A comparison

prompt can ask learners to explain why similar actions produced different consequences or why different actions served a similar purpose. It can also ask them to identify what additional information would be needed before transferring a recommendation. These activities preserve the originating essay's interest in multiple examples while replacing the assumption that accumulation alone produces adaptive understanding with a more specific account of comparative work.

2.4 Cognitive Flexibility and Contextual Complexity

Cognitive Flexibility Theory provides the principal account of why learning from cases becomes especially important when knowledge application varies across situations. Spiro et al. (1988) distinguish advanced knowledge acquisition from introductory learning and argue that oversimplified representations can obstruct subsequent understanding of complex subject matter. Their concern is not complexity as mere difficulty, but the interaction of multiple conceptual dimensions whose relevance changes with context. A situation can therefore be comprehensible without being adequately represented by one invariant explanatory template. For this article, an ill-structured situation is one in which the relevant interpretation or response cannot be exhaustively specified through a straightforward application of a single preselected rule. This definition does not imply that the domain lacks standards, evidence, or useful principles. It instead requires that learners determine how principles interact and where their application needs qualification. The originating essay's emphasis on assembling resources from different experiences is retained as an accessible expression of this problem. However, the present argument treats that assembly as a reasoned and assessable activity, not as a guarantee that exposure will automatically produce appropriate intuition.

The instructional implications of Cognitive Flexibility Theory concern how learners revisit knowledge as well as how many cases they encounter. Spiro et al. (1991) connect multiple representations, contextual variation, and nonlinear exploration in their account of advanced learning through hypertext. Hu and Spiro (2021) extend this orientation to online learning, emphasizing preparation for future situations rather than confinement to currently presented templates. Jacobson and Spiro (1995) provide an empirical investigation of a theory-based hypertext environment, illustrating how the account can inform an instructional design that is subsequently studied. The present synthesis does not treat these contributions as proof that all nonlinear environments improve learning. Instead, they establish a theoretical rationale for linking revisitation to changing interpretive purposes. A learner may revisit one case to examine a different stakeholder, reconsider a previously ignored constraint, or compare its outcome with a contrasting instance. The same material can consequently support several defensible readings without making all interpretations equally warranted. In practical terms, a case library should enable movement among cases and concepts while retaining enough contextual information to prevent fragments from becoming misleading substitutes for the situations from which they were drawn.

2.5 Narrative Engagement and the Limits of Persuasive Success

Narratives can influence learning situations through attention and interpretation, but persuasive success must remain distinct from epistemic success. Green and Brock (2000) investigate transportation into narratives and its relationship to story-consistent beliefs, identifying a psychological process relevant to the influence of a compelling account. Dahlstrom (2014) examines narrative communication with nonexpert audiences and explicitly considers the ethical difference between using stories for comprehension and using them for persuasion. These perspectives explain why the originating essay's enthusiasm for memorable stories requires a qualification rather than wholesale rejection. A narrative can invite sustained engagement with an unfamiliar problem while simultaneously encouraging acceptance of an oversimplified explanation. An instructor should therefore avoid inferring that a strongly expressed response demonstrates accurate understanding or responsible judgment. The recommended response is not elimination of emotion, because personal stakes can legitimately matter to the topic being studied. Rather, interpretation should include questions about what the narrative foregrounds, whose perspective it privileges, and which alternative explanations it leaves unexamined. These questions connect engagement to critical inquiry instead of allowing engagement to become the sole criterion of instructional value.

The identifiable victim literature illustrates why a vivid research example should itself remain open to evidentiary revision. Small et al. (2007) reported findings on donations to identifiable and statistical victims and examined how deliberative interventions affected generosity. The originating essay invokes this work to support the emotional force of an individual story, but that lesson cannot responsibly become an unrestricted principle that anecdotes outperform statistics. Maier et al. (2023) revisited the findings through replication and extension, reporting results that did not support the focal effects in their design and identifying reasons to reconsider the broader evidence. Their study differed from the original in relevant respects, including online administration and hypothetical rather than actual donation decisions. Those differences limit a simple declaration that every identifiable-victim effect has been disproved. They also prevent an equally simple continuation of the original finding as an uncontested instructional rule. The appropriate conceptual lesson is that evidence about narrative influence requires attention to outcomes, settings, designs, and subsequent investigation. A responsible case for cases must apply its demand for qualification to the examples used in its own defense.

2.6 Learner Activity, Prior Knowledge, and Explanatory Restraint

The way learners act on a case matters because exposure and explanation are different forms of engagement. Chi et al. (1989) examined how students studied examples and connected self-explanation with their learning processes, providing a basis for attending to the reasoning learners generate while studying material. Chi and Wylie (2014) distinguish passive, active, constructive, and interactive engagement within the ICAP framework, connecting observable activities with hypothesized knowledge-building processes. These contributions support designing case work around explanation, revision, and substantive comparison rather than assuming that reading or discussion alone demonstrates deep engagement. A student can participate frequently while repeating the narrative, just as a quiet written response can contain a carefully reasoned reconstruction. Consequently, the analysis should focus on the content of the learner's contribution rather than equating visibility with quality. Appropriate prompts might require a causal account, an alternative interpretation, or an explanation of why a recommendation would fail under changed conditions. The proposed framework uses such prompts as design recommendations, not as a claim that any particular discussion format has already been validated. Their effectiveness remains dependent on implementation, task demands, and the criteria used to evaluate learning.

Prior knowledge complicates any universal recommendation about the amount of complexity or guidance a case should contain. Kalyuga et al. (2003) describe the expertise reversal effect, showing why assistance that supports inexperienced learners can become less useful as relevant knowledge develops. Tetzlaff et al. (2025) provide meta-analytic support for expertise-sensitive instruction while also identifying variation across educational groups and domains. These findings support adapting assistance, but they do not justify identifying expertise from confidence, occupational title, or age alone. Within the proposed framework, prior knowledge concerns the specific concepts and procedures required by the case. An experienced professional can still need substantial support when encountering an unfamiliar analytical task, while a novice can possess relevant knowledge about a particular context. Instruction should therefore make it possible to diagnose what the learner understands before increasing ambiguity or removing guidance. The originating essay's preference for numerous and varied examples consequently needs to be conditioned on the learner's capacity to interpret the differences. Preserving complexity should not mean transferring all of the interpretive burden to a learner who lacks the resources needed to manage it.

2.7 Transfer, Epistemic Cognition, and the Need for Multiple Explanatory Levels

Knowledge transfer requires a more precise outcome definition than the general claim that a learner can apply a lesson elsewhere. Barnett and Ceci (2002) distinguish dimensions along which learning and application contexts can differ, making transfer a multidimensional problem rather than a single undifferentiated achievement. A student who recognizes a familiar principle in a closely related exercise has demonstrated something different from a professional who reconstructs a response after substantial changes in setting, time, and task. The present synthesis therefore separates recall, explanation, recognition of applicability, adaptation, and justified nonapplication as possible outcomes. These distinctions are proposed for instructional alignment, not offered as a standardized developmental sequence. A learner may explain a principle accurately yet fail to recognize when it matters, or may identify an apparent analogy while failing to notice a decisive difference. Assessment should consequently include opportunities to withhold transfer when the conditions do not support it. An intervention that increases the frequency of transferred solutions without improving their appropriateness would not satisfy the article's conception of adaptive learning. This makes the quality and calibration of application more important than its mere occurrence.

Explanatory restraint is equally necessary when moving from observable learning processes to claims about their neurological basis. The originating essay proposes mirror neurons as one possible explanation for why stories aid understanding, but it provides no direct evidence connecting a specified instructional activity to that mechanism (Elassad, n.d.). Hickok (2009) critically examines strong claims about mirror neurons and action understanding, illustrating why broad educational conclusions should not be inferred from an appealing neural analogy. The present framework neither denies neural involvement in learning nor offers a competing neuroscience account. It instead locates its claims at the level supported by the literature being integrated: representation, comparison, explanation, engagement, and contextual application. Chinn et al. (2011) provide a complementary reason to examine the aims and justificatory processes through which a learner treats information as knowledge. The resulting analysis distinguishes a plausible mechanism from an established mechanism and an instructional recommendation from demonstrated effectiveness. Those distinctions are essential because a case-based pedagogy concerned with responsible reasoning should model the evidentiary discipline it asks learners to practice. Its theoretical coherence must not depend on a neurological assertion that the available sources do not establish.

3. METHODOLOGY

3.1 Conceptual Design and Source Selection

This article uses a conceptual research design organized around theory synthesis and framework development, not a report of an educational intervention. Jaakkola (2020) describes conceptual approaches that make their theoretical choices and analytic logic explicit, while Torraco (2005) emphasizes analysis and synthesis in integrative literature work. These contributions guide the structure of the present inquiry without converting its purposive selection into a systematic review. No participants were recruited,

no interviews or classroom observations were conducted, and no original numerical outcomes were generated. The originating essay serves as a sensitizing text that identifies the practical problem and the principal themes requiring theoretical clarification. It is not treated as a dataset demonstrating the effectiveness of examples or as a representative sample of professional experiences. Published scholarship supplies the conceptual and empirical resources against which the essay's claims are examined. The results reported below therefore consist of distinctions, relationships, design requirements, and research propositions. They should be evaluated for clarity, internal consistency, evidentiary alignment, and usefulness for subsequent investigation, rather than for statistical significance or generalizability from an original sample.

Literature selection was purposive and directed toward the explanatory tasks identified in the originating essay. Targeted searches used combinations of case-based reasoning, worked examples, analogical transfer, cognitive flexibility, narrative persuasion, identifiable victims, epistemic cognition, and conceptual article methodology. Searches for named foundational works supplemented topic searches, and bibliographic details were checked against publisher pages or accessible scholarly copies. Selection favored original theoretical contributions, empirical investigations relevant to the proposed mechanisms, and subsequent research that materially qualified an influential claim. The search was conducted for manuscript development in October 2026, but it did not constitute comprehensive database coverage or a preregistered evidence identification protocol. No claim is made that all relevant publications were retrieved or that the selected literature represents a statistically defined population of studies. Commercial testimonials, unsourced performance percentages, and social-media endorsements from the originating essay were excluded as support for effectiveness claims. They informed recognition of the practical problem but were not assigned the status of independently verified observations. The reference list identifies the sources used, while the analytic claims remain limited to the scope of those sources and the conceptual relationships explicitly developed here.

3.2 Analytic Procedure and Standards of Interpretation

The analysis proceeded through four linked conceptual operations that structure the reasoning presented in this manuscript. First, conceptual differentiation separated the representation used, the function assigned to it, and the inference drawn from it. Second, mechanism comparison examined how selected accounts explain learning through prior experience, relational alignment, self-explanation, narrative engagement, and contextual reconstruction. Third, boundary analysis considered circumstances in which a proposed benefit could weaken, fail, or conflict with another instructional purpose. This stage included novice overload, superficial analogy, unverified provenance, persuasive overreach, and inappropriate transfer. Fourth, framework construction translated the comparison into design requirements and propositions that could be examined in future empirical work. These operations did not involve independent coders, a coded corpus, an intercoder reliability calculation, or a numerical synthesis of published effects. They are transparent reasoning procedures rather than substitutes for such methods. The manuscript distinguishes claims attributed to sources from the integrative interpretation proposed here, and it identifies the instructional vignette in the results as a constructed illustration rather than an observed case.

The principal standard of interpretation is correspondence between a claim's scope and the support available for it. A published experiment can support discussion of the conditions and outcomes it examined, whereas a theoretical account can motivate an explanatory relationship without establishing its magnitude. The originating essay can document the argument being developed, but it cannot verify the organizational anecdotes it reproduces. Similarly, the new framework can organize instructional decisions without demonstrating that adopting it will improve performance. Apparent agreement between theories is not treated as empirical confirmation, and tensions between them are retained when their assumptions or target tasks differ. The comparison therefore avoids a simple vote-counting logic in which the number of supportive citations determines the strength of a conclusion. Alternative explanations and disconfirming conditions are included wherever they materially affect the proposed relationship. Because the analysis is interpretive and selectively sourced, another defensible selection could produce a different configuration of concepts. The framework is consequently advanced as an assessable proposal whose usefulness and limitations must be examined through implementation, criticism, and future research.

4. RESULTS

4.1 Five Functions of Cases

The first conceptual result is a distinction among five functions that cases can perform within instruction: illustration, epistemic testing, engagement, relational comparison, and adaptive reconstruction. These functions organize the preceding analysis; they are not statistical factors extracted from observations or mutually exclusive categories of material. Illustration makes a concept or procedure intelligible through a particular instance, so its success depends on correspondence between the example and the intended idea. Epistemic testing examines what a claim predicts, permits, excludes, or fails to explain, so its success depends on the relevance and credibility of the instance. Engagement directs attention toward people, decisions, and consequences, while relational comparison supports examination of similarities and differences across situations. Adaptive reconstruction concerns the selective use of prior knowledge when the present situation does not permit straightforward repetition. One case can perform several functions, but an activity should identify which function is primary and which additional inferences are not warranted. The same

narrative may therefore be suitable for opening a discussion but unsuitable as the sole basis for recommending a policy. This distinction supplies a practical answer to the article's first question without treating all uses of cases as equivalent manifestations of one mechanism.

Each function also has a characteristic failure condition, which gives the taxonomy instructional significance beyond terminology. Illustration fails when the example promotes a misleading understanding of the concept, even if the story itself is accurately remembered. Epistemic testing fails when the case is misdocumented, irrelevant to the proposition, or used to support a conclusion beyond its evidentiary reach. Engagement becomes problematic when attention and emotional force substitute for examination of reasons. Relational comparison fails when learners transfer surface features while overlooking differences that change the relevant relationship. Adaptive reconstruction fails when selected fragments are recombined without sufficient regard for compatibility or present constraints. These failure conditions imply different diagnostic questions, because an unsuccessful lesson might require better evidence, clearer explanation, more useful contrasts, or a different assessment rather than simply additional cases. The taxonomy is therefore best understood as a map of possible instructional purposes and errors, not as a ranking of cases from inferior to superior. It also clarifies why no single measure, such as recall, enjoyment, participation, or confidence, can establish success across all five functions.

4.2 Demonstrating the Five Functions Through Three Cases

Three cases make the five functions concrete while preserving the distinction between illustration and empirical validation. The first foregrounds epistemic testing, the second engagement, and the third combines relational comparison, illustration, and adaptive reconstruction. The cases have different evidentiary statuses: a recorded public deliberation, a published experiment, and a retrospective account of organizational reasoning. They are presented here to demonstrate the functions, not as a newly collected dataset or as validation of the proposed framework.

Case 1: Epistemic Testing Through a Request for Precedent

Kevin Esvelt's discussion with an island community in *Unnatural Selection* illustrates how a request for precedent can function as an epistemic test (Egenter & Kaufman, 2019). The proposed Mice Against Ticks intervention seeks to reduce disease transmission by establishing heritable resistance in white-footed mice, which differs from eliminating ticks or introducing a different mouse species (Buchthal et al., 2019). In the documentary exchange, a community member asks whether introducing a species to an island has ever produced a beneficial result and raises concerns about reversibility, while Esvelt acknowledges unsuccessful precedents and refers to laboratory work (Egenter & Kaufman, 2019). The question directs attention to whether the support being offered addresses the ecological intervention under consideration rather than only its laboratory feasibility. Read through the present framework, the exchange exposes a gap in the justification offered during the discussion, not proof that the proposed intervention would fail. The comparison itself also requires scrutiny because modifying a resident species is not equivalent to introducing a new one. The educational value therefore lies in examining both the adequacy of the response and the relevance of the precedent being requested. This case demonstrates epistemic testing as disciplined inquiry into what is known, what remains uncertain, and what additional evidence would justify proceeding.

Case 2: Engagement Through an Identifiable Victim

Small et al. (2007) provide an example of the engagement function through their comparison of charitable appeals about an identifiable child and statistical information about food insecurity in Africa. In the identifiable-victim condition, participants encountered Rokia, a seven-year-old girl from Mali, whereas the statistical condition described the needs of much larger populations. The original study reported greater donations in response to the identifiable appeal than to the statistical appeal, illustrating how a particular person's circumstances can motivate action. The case makes engagement visible through a behavioral outcome rather than through an assumption that a story must be emotionally effective. At the same time, donation behavior does not establish that participants learned more, remembered the material longer, or made better allocation decisions. Its instructional relevance is therefore the possibility of connecting an abstract social problem with personally intelligible stakes, not the general superiority of anecdotes over statistics. The replication qualifications discussed in the literature review remain applicable to this illustration (Maier et al., 2023). Read in this bounded way, the Rokia example shows why narrative engagement is an important function of cases but cannot substitute for assessing understanding or evidentiary judgment.

Case 3: Relational Comparison, Illustration, and Adaptive Reconstruction

Clayton Christensen's exchange with Andy Grove, then chief executive of Intel, illustrates how one case can support several functions at once (Parsons & Owen, n.d.). Christensen, author of *The Innovator's Dilemma*, described how steel mini-mills entered the market through inexpensive reinforcing bar and subsequently moved into higher-value segments as their capabilities improved (Parsons & Owen, n.d.). According to MacFarquhar (2012), the comparison helped Grove articulate a threat from the lower end of the microprocessor market, made rebar an internal company mantra, and informed Intel's response through the lower-priced Celeron chip. Relational comparison operates here through the alignment of competitive positions and market trajectories, not through a surface resemblance between steel and semiconductors. Illustration gives concrete structure to a threat that Grove had

sensed but had difficulty articulating. Adaptive reconstruction occurs when the competitive pattern from steelmaking is reinterpreted through Intel's products, competitors, and strategic choices rather than copied as an identical procedure. The case thus provides material for developing a context-sensitive response without prescribing every feature of that response. Its use as a shared organizational reference also shows how one example can connect individual interpretation with collective discussion. These functions overlap within the narrative while remaining analytically distinguishable. Nevertheless, the retrospective accounts support an interpretation of how an example informed managerial reasoning, not a controlled causal conclusion that the story alone produced Celeron's success (MacFarquhar, 2012; Parsons & Owen, n.d.).

4.3 An Integrated Framework for Case Design

The second result is a framework of six connected design requirements, beginning with specification of purpose and establishment of provenance. Before selecting a story, the instructor identifies whether the intended task concerns understanding, claim evaluation, engagement, comparison, or adaptation. The instructor then determines what the material is: a documented occurrence, a research case study, an attributed anecdote, a composite, or a fictional scenario. This information should be visible to learners whenever it affects the conclusions they can draw. Provenance disclosure does not make uncertain material unusable, since a speculative case can still support conceptual analysis when its status is clear. Instead, it prevents a representation from acquiring empirical authority merely because its details sound realistic. The proposed framework therefore asks instructors to specify both the intended achievement and the evidentiary ceiling of each case. A concise case note might identify the source, the basis of factual claims, the instructional purpose, and the principal limitations on inference. Such a note is a proposed design practice, not a validated instrument for assessing research quality or a replacement for disciplinary standards.

The third requirement is selection of meaningful contrasts, and the fourth is scaffolding the interpretation those contrasts are intended to support. Meaningful diversity concerns differences that matter to the target judgment, not the indiscriminate multiplication of sectors, characters, or narrative details. A set may contrast similar actions under different constraints, similar outcomes produced by different processes, or cases that initially appear analogous but are not. The instructor should make enough common structure available for comparison while retaining the differences that determine applicability. Scaffolding can then direct attention through an annotated example, a question sequence, a partially completed comparison, or a request for an alternative explanation. The amount of assistance should respond to the learner's demonstrated knowledge of the task rather than remain fixed for every participant. This design recommendation synthesizes the preceding analysis of comparison and prior knowledge, but its optimal form will require empirical determination. Importantly, support should clarify the reasoning process without predetermining every conclusion in a genuinely contestable case. The goal is a defensible interpretation that can survive scrutiny, not reproduction of the instructor's preferred story about what the case means.

The fifth requirement is assessment of transfer, and the sixth is recalibration of the claims learners and instructors make after the activity. An assessment should present a situation that differs in relevant respects from the teaching cases and require a justified response. It should include at least some opportunity to identify that an apparently useful precedent does not apply, because appropriate restraint is part of adaptive judgment. Learners should explain which features support transfer, which features constrain it, and what further evidence would change their decision. Their explanations can then be compared with their confidence and with explicit criteria for the target task. Recalibration occurs when feedback leads them to narrow, revise, or strengthen an initial claim in light of reasons they can articulate. This process should also apply to the instructor's interpretation of the lesson, since enthusiastic discussion does not establish durable transfer. The six requirements form a connected sequence for planning and evaluation, but implementation may involve revisiting earlier decisions as new misunderstandings emerge. The framework thus emphasizes traceable relationships among purpose, representation, activity, and outcome rather than prescribing a universally fixed lesson format.

4.4 Four Propositions for Empirical Examination

The third result consists of four propositions that translate the framework into relationships open to testing. Proposition 1 states that, when instructional content and time are comparable, meaningful case variation combined with explicit comparative activity will improve identification of applicability conditions more than variation presented without comparative activity. The proposed mechanism is that directed comparison makes relevant relationships available for examination instead of leaving learners to infer them incidentally. The target outcome is not the number of similarities recalled, but the quality of explanations concerning where a recommendation should and should not transfer. A suitable study would contrast matched case sets accompanied by separate summaries or by structured comparison prompts. It would assess performance on new situations that include both genuine and misleading analogies. Prior knowledge and the complexity of the comparison would need to be measured or otherwise addressed in the design. A null result would challenge the proposed advantage under the tested conditions, while evidence of poorer performance would indicate that the comparison-imposed demands exceeding its instructional benefits. This proposition extends established comparison research into an explicit focus on the calibration of applicability, rather than claiming that the underlying comparison mechanism is new.

Proposition 2 states that disclosure of case provenance combined with explicit discussion of inferential scope will reduce unwarranted generalization without necessarily increasing or decreasing narrative engagement. The prediction separates epistemic effects from affective effects, because a learner could remain interested in a fictional scenario while understanding that it establishes no empirical occurrence. A study could present matched instructional narratives with different forms of provenance information and ask participants to evaluate what each account supports. Relevant outcomes would include discrimination among possibility, occurrence, typicality, and causal explanation, rather than a single global credibility rating. Researchers should also test whether disclosures become superficial labels that participants overlook when the narrative is especially compelling. The proposition would receive weaker support if learners remembered the provenance but continued to overextend the conclusion. It would require revision if disclosure prevented understanding of an otherwise useful example without improving reasoning. This relationship follows from the article's conceptual distinction between pedagogical and evidentiary functions; it has not been demonstrated by the present analysis. Its value lies in specifying an outcome that case-based instruction often assumes rather than directly examining.

Proposition 3 states that the relationship between case complexity and adaptive performance will depend on task-relevant prior knowledge and the availability of appropriate interpretive support. Proposition 4 states that assessment requiring both justified transfer and justified nontransfer will distinguish adaptive understanding from indiscriminate reuse more effectively than assessment rewarding application alone. The third proposition can be examined through designs that vary assistance and complexity while measuring the specific knowledge needed to interpret the case. The fourth requires assessment tasks whose relevant similarities and differences are independently specified and subjected to expert scrutiny. Together, the propositions predict that apparent instructional success can change when the outcome moves from remembering or applying a lesson to judging whether application is warranted. They do not predict an invariant optimal number of cases, a universal assistance level, or a numerical threshold of cognitive flexibility. Researchers would need to establish the reliability and validity of their measures rather than treating the framework itself as a validated scale. Alternative explanations could include differences in reading demands, motivation, or familiarity with the assessment format. All four propositions therefore remain conditional theoretical expectations intended to guide investigation rather than substitute for it.

4.5 Constructed Illustration of the Framework

A constructed professional-learning vignette illustrates how the framework changes the use of an attractive success story. Consider a hypothetical workshop in which participants examine a café that responds to customer feedback by changing its ordering process. A second fictional case concerns a software provider facing incompatible requests from different customer groups, and a third concerns a training organization that collects extensive feedback but lacks authority to implement changes. None of these cases represents an observed organization or supplies evidence that a feedback intervention improves performance. Their purpose is to make different relationships among information, interpretation, resources, and decision authority available for comparison. Participants first identify the problem each organization is trying to solve and distinguish the existence of feedback from the capacity to act on it. They then explain why copying the café's visible procedure would not necessarily address the other organizations' constraints. A final scenario introduces a new setting and asks participants either to adapt part of an earlier response or to justify withholding that recommendation. The instructional result sought is a reasoned judgment about applicability, not endorsement of feedback collection as an intrinsically successful practice.

The vignette becomes diagnostically useful when participants distinguish a plausible interpretation from a supported factual conclusion and a justified recommendation. They might propose that decision authority matters, but the fictional cases cannot establish its effect across actual organizations. They can nevertheless explain why an organization unable to act on feedback presents a different decision problem from one able to implement changes. A facilitator could then request evidence that would be needed to investigate that proposed relationship outside the exercise. Participants might identify implementation records, alternative explanations, stakeholder accounts, and measures aligned with the outcome of interest. These suggestions would demonstrate the direction of further inquiry rather than complete that inquiry. The activity could conclude with a revised statement replacing an unconditional recommendation with a conditional explanation of when a feedback process might be useful. This revision would show how the framework connects conceptual understanding, comparison, and evidentiary restraint within one instructional sequence. Importantly, the example's own limitations remain visible throughout: it illustrates a design logic and the reasoning that logic seeks to elicit, while providing no basis for claiming that a workshop, facilitator, or participant has already achieved the proposed learning outcomes.

5. DISCUSSION

5.1 From Compelling Illustration to Responsible Judgment

The principal implication of the synthesis is that case-based learning should cultivate judgment about examples rather than merely increase exposure to them. The originating essay correctly identifies a practical difficulty when abstract claims arrive without any recognizable account of their application, but concreteness resolves only part of that problem (Elassad, n.d.). A vivid narrative can conceal the conditions that made an action possible, just as a general principle can conceal the variation that limits its use. The

proposed framework places these difficulties within a common instructional problem: aligning what learners see with what they are entitled to conclude. This alignment reframes the request for an example as the beginning of inquiry rather than its endpoint. After obtaining an instance, the learner must still ask how it was documented, why it matters, and which alternative accounts remain plausible. The article's contribution is therefore not an argument against stories, abstraction, or emotional engagement, but an argument against treating their usefulness as self-validating. It proposes that educational case work should make its own inferential practices inspectable. Such transparency is particularly important when the eventual learning objective concerns decisions whose consequences extend beyond the classroom.

The proposed integration also clarifies a tension between analogical abstraction and the preservation of contextual complexity. Comparison research highlights the value of recognizing shared relational structure, whereas Cognitive Flexibility Theory cautions against reductive representations that obscure the variable interaction of concepts (Gentner, 1983; Spiro et al., 1988). These positions need not be forced into complete theoretical equivalence. The present interpretation treats abstraction as useful when it identifies a relationship worth considering, while contextual reconstruction determines how that relationship operates in a particular situation. In this account, a general pattern is a resource for judgment rather than a finished judgment awaiting mechanical application. Learners should be able to articulate both a common relation and the differences that modify its significance. The instructional challenge is consequently to avoid two symmetrical errors: preserving detail without enabling comparison and extracting commonalities without preserving conditions of use. The framework does not resolve that challenge through a universal balance of detail and simplicity. It instead provides questions through which an instructor can make and subsequently evaluate a task-specific decision.

5.2 Instructional Sequencing and Assessment

Instructional sequencing should be organized around changes in the reasoning learners are expected to perform. A sequence might begin with a relatively transparent example, introduce a contrast that destabilizes an overly broad interpretation, and then present a case requiring selective reconstruction. This sequence is a design proposal derived from the synthesis, not a demonstrated developmental law or a replacement for subject-specific pedagogy. Its purpose is to make increasing complexity intelligible rather than to postpone complexity indefinitely. Instructors would need to examine whether students possess the vocabulary and conceptual resources required for each transition. They would also need to distinguish support that enables reasoning from support that simply supplies an answer. The preceding literature on examples and expertise-sensitive guidance motivates this distinction, but it does not establish a single best sequence for all domains (Kalyuga et al., 2003; Sweller & Cooper, 1985). Different tasks may require movement back toward explicit modeling when a new form of analysis becomes necessary. Accordingly, the framework supports adaptive sequencing while leaving its specific timing and instructional form open to evaluation.

Assessment should make the difference between remembering a case and reasoning with it observable. A learner might accurately reproduce the events of a story while overlooking the feature that makes its solution inappropriate elsewhere. Conversely, a learner might recall fewer narrative details yet provide a well-supported explanation of why a proposed analogy fails. The proposed assessment approach therefore uses multiple outcomes rather than allowing fluency or recall to stand for the entire construct of learning. Written explanations, annotated comparisons, revised recommendations, and responses to counterexamples are possible sources of evidence, provided their evaluation criteria match the instructional purpose. These materials should be assessed for the accuracy of relevant relationships, attention to constraints, consideration of alternatives, and proportionality of the conclusion. The criteria are recommendations requiring validation, not an existing psychometric instrument. Instructors should also examine whether a task inadvertently rewards confidence, disciplinary jargon, or familiarity with a culturally specific scenario rather than the intended reasoning. Assessment that permits a justified decision not to transfer a lesson is especially important because it recognizes restraint as a potentially successful outcome.

A further implication concerns the distinction between difficulty with a case and difficulty with the reasoning it is intended to assess. A scenario may demand unfamiliar terminology, institutional knowledge, or narrative conventions that are incidental to the target judgment. Under those conditions, weak performance would admit explanations other than inadequate understanding of the principle under examination. The framework therefore recommends reviewing cases for unnecessary background assumptions and making essential contextual information available. Alternative response formats could preserve the analytical demand while changing the means through which learners express their reasoning. For example, an annotated comparison and a spoken explanation might both reveal attention to relevant constraints, although their scoring would require separate consideration. These suggestions are design inferences rather than established accommodations validated by this article. Their empirical evaluation should examine whether changes preserve the intended construct and improve the interpretability of performance. The same scrutiny should apply to apparently authentic cases, since authenticity alone does not show that every detail is necessary for the learning objective. A responsible design asks which demands belong to the intellectual task and which merely reflect avoidable features of its presentation.

5.3 Ethical Selection and Digital Case Libraries

The selection of cases is an ethical as well as a cognitive decision because it determines whose experience becomes visible and which outcomes appear normal. The framework does not assume that a library containing many stories is automatically

representative, balanced, or fair. A collection dominated by accessible success narratives can make particular resources, institutional capacities, or decision pathways appear more available than they are. This is a conceptual risk arising from selection, not a claim that all published case collections have the same bias. Designers should therefore ask which perspectives are absent, whether unsuccessful or ambiguous outcomes have been retained, and whether a protagonist's account has displaced other relevant interpretations. Narrative ethics in communication provides a related reason to distinguish explanation from efforts to secure agreement through an emotionally compelling representation (Dahlstrom, 2014). For teaching, the proposed response is to make selection decisions discussable rather than pretending that a case is a neutral window onto a complete situation. Attributed testimony should remain distinguishable from independently corroborated information, and reconstructed dialogue should not be presented as verbatim evidence. Such practices support critical engagement without requiring every teaching case to become an exhaustive empirical investigation.

Digital case libraries offer a setting in which the proposed distinctions can be made operational through the organization of materials. Following the contextual emphasis of Hu and Spiro (2021), a library designed for adaptive learning should support movement among situations, concepts, and alternative interpretations rather than merely store narratives in sequence. The present framework would attach purpose, provenance, relevant constraints, and questions of applicability to each entry. Links could connect cases that share an outcome but differ in mechanism, or cases that share a strategy but differ in the conditions permitting its use. These are design possibilities, not claims about the effectiveness of an existing platform. The same requirements apply when a system helps construct hypothetical examples: generating plausible detail cannot supply documentary evidence that an event occurred. Fictional and composite materials should remain clearly identified, even when they are pedagogically useful. Learner activity within a library would also need evaluation beyond access counts, since opening many cases does not demonstrate the quality of comparison or reconstruction. A digital environment becomes educationally defensible through the reasoning it supports and the claims its users can justify, not through the volume or vividness of its content alone.

5.4 Research Agenda and Limitations

An empirical research agenda should begin by testing components of the framework before evaluating the entire configuration as a single intervention. One study could examine the effect of comparison prompts on judgments of applicability, while another could investigate how provenance disclosure affects unsupported generalization. A later study could evaluate how assistance interacts with prior knowledge during interpretation of a diverse case set. Such sequencing would help identify which components contribute to an outcome and which merely accompany an engaging activity. Designs should specify both the intended learning outcome and plausible unwanted consequences, including confident overgeneralization or increased reliance on superficial analogies. Where practical, matched instructional time and equivalent access to content would make alternative explanations easier to assess. Researchers should also include delayed or altered-context tasks when making claims about durability and transfer, consistent with the need to specify how learning and application situations differ (Barnett & Ceci, 2002). Qualitative analysis could examine the reasons learners provide without being presented as an automatic validation of causal effectiveness. The broader goal would be a cumulative account of when the framework helps, for whom, and under which instructional conditions.

Several limitations constrain the conclusions of the present article and should guide interpretation of its contribution. The literature was selected purposively, so the synthesis does not estimate the overall strength of evidence for case-based learning or establish exhaustive coverage of competing theories. Its five functions may overlap in practice, and further conceptual work could identify additional distinctions or a more useful organization. The six requirements are not proven necessary or sufficient conditions for successful instruction. The four propositions likewise require operational definitions, appropriate measures, and designs capable of evaluating their alternative explanations. The originating essay contributes the practical problem and some framing ideas, but its unverified anecdotes do not provide empirical support for the new framework. The constructed vignette demonstrates how the framework can be interpreted, not that learners benefit from using it. Furthermore, a theoretically coherent connection among instructional purposes may be difficult to implement under limits on time, staffing, or available case documentation. The article therefore offers a bounded contribution: a transparent conceptual architecture for coordinating learning from cases with responsible reasoning about them, whose usefulness remains open to empirical and scholarly scrutiny.

6. CONCLUSION

A defensible case for cases must explain both why particular situations are useful for learning and why their usefulness does not eliminate the need for justification. This article has developed that argument by connecting the originating essay's concern with practical examples to scholarship on reasoning, instruction, comparison, narrative influence, and contextual adaptation. Its conceptual results distinguish five functions of cases and organize six design requirements around their intended purposes and evidentiary limitations. The central recommendation is that cases should be selected, interpreted, compared, and assessed in ways that keep claims proportional to support. Multiple examples matter when their variation becomes meaningful to learners, not simply when their number increases. Narrative engagement matters when it sustains inquiry without displacing the examination of reasons. Transfer matters when learners can justify both application and nonapplication in situations that differ from those previously

encountered. These conclusions constitute an instructional proposal rather than a report of demonstrated intervention effects. Their value lies in making the relevant design decisions and evaluative questions explicit enough to be criticized, implemented, and tested.

The practical challenge is therefore not to choose between abstract principles and concrete stories, but to design relationships between them that preserve intelligibility, contextual sensitivity, and evidentiary discipline. A case can reveal what a principle leaves unspecified, while a principle can help a learner identify which features of a case deserve attention. Comparison can make that relationship visible, and assessment can test whether the learner can reconstruct it when circumstances change. The same instructional process should teach that an appealing example may warrant a question, a possibility, or a bounded conclusion rather than an unrestricted recommendation. This orientation preserves the originating essay's conviction that examples help people engage with complex ideas while strengthening its account of what responsible engagement requires. It also protects the argument from becoming a collection of persuasive stories about why persuasive stories should be trusted. Future research should examine whether the proposed alignment improves understanding, calibration, and adaptive judgment across different settings. Until that evidence is available, the framework should be used as a reasoned guide to inquiry rather than as a certified solution. The strongest case for cases ultimately rests on making particular experiences available for careful thought, not on allowing their particularity to excuse the work of reasoning under conditions of uncertainty and contextual variation.

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