Compression with a Witness

Narrative by Design, AI-as-Mirror, and the 90-Minute Workshop as Research Instrument

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ABSTRACT

Career advising at the institutional level is dominated by the resume and the interview script. Both formats presume that students already know what they want to say about themselves and need help saying it more effectively. Many students do not lack experience; they lack a structured method for finding the meaningful pattern inside what they have already done. This paper documents Narrative by Design (NBD), a 90-minute facilitated workshop developed at Dartmouth College that supports narrative discovery through three operations: a compression sequence that takes the student from a free-form paragraph to a single defended word; three card-sort instruments adapted from established assessments (Knowdell Career Values, CliftonStrengths, Motivated Skills) that triangulate the student's values, strengths, and skills; and an AI-assisted mirror layer that surfaces gaps between the student's self-description and the evidence the card sorts produce. We draw on McAdams's narrative identity theory (McAdams, 1993, 2001), Pennebaker's research on expressive writing (Pennebaker, 1997), Mezirow's transformative learning framework (Mezirow, 1997), and recent work on generative AI in education (Mollick & Mollick, 2023). We argue that the 90-minute time constraint is itself a pedagogical design move (not a logistical compromise) and that the AI layer functions as mirror, not advisor. The paper positions NBD as the prototype testing Research Questions 2 and 4 within the lab's broader research program.

KEYWORDS narrative identity · compression · card-sort triangulation · AI as mirror · expressive writing · disorienting dilemma · facilitated workshop · time-constrained pedagogy · self-authorship · generative AI in education

1. Introduction

Ask a senior in college to tell you about themselves and you typically get one of two things: a chronological list of everything they have done, in the order they did it, or a rehearsed script that sounds like every other senior's script. Neither works. The list is too long and has no center. The script has no life in it. Both miss the point, which is to say something true about who the student is and what drives them, in a way that actually lands with the person they are speaking to.

The gap is not missing experience. By the senior year, most students have plenty. The gap is missing method. Nobody has taught these students how to look at their experience, find the thread running through it, and

compress it into something clear enough to defend in conversation. Career services typically gives them resume templates and interview scripts. What they need is the operation that precedes the resume and the script: figuring out what their story actually is, before they try to tell it.

This paper documents Narrative by Design (NBD), a 90-minute facilitated workshop built around one core operation: *narrative compression*. Students start with a messy unfiltered paragraph about who they are. They cut it to a sentence. They cut the sentence to a single word. Each compression is a forced choice. What the student keeps and what they discard tells them, often uncomfortably, what they actually consider central. The compressed word is not a brand or a permanent label; it is a decision tool, a temporary center the student can use to evaluate subsequent opportunities.

The compression operation does not stand alone. The workshop pairs it with three card-sort instruments (values, strengths, skills) and an AI-assisted mirror layer that reads the student's outputs across all four operations and surfaces gaps the student would not surface alone. The three layers function together: the compression produces an articulated direction, the card sorts produce evidence, and the AI surfaces the discrepancy. The discrepancy is the developmental work.

The argument here is about design choice. It does not report measured outcomes, and the empirical work that would test the design moves is named in Section 5.4 as the agenda the workshop opens.

The paper proceeds as follows. Section 2 develops the theoretical background across four literatures: narrative identity theory, expressive writing as developmental mechanism, the productive-gap mechanism in adult learning, and the emerging literature on generative AI in education. Section 3 describes the design-based research methodology that frames the work. Section 4 describes the workshop in detail. Section 5 discusses what the design move implies, what its limitations are, and what research lines it opens.

2. Theoretical Background

2.1 Narrative Identity as the Developmental Frame

Dan McAdams's narrative identity theory (McAdams, 1993, 2001) treats identity as the story a person constructs and continuously edits about who they are, where they have come from, and where they are going. The story is not metaphorical; it is the operating epistemology of the self. The implication for a tool that supports career thinking is direct: the tool is, in part, a tool that supports the editing of a story. McAdams's research program has documented, across a substantial empirical literature, that narrative identity becomes more coherent and more reflective across young-adult development, and that the development is itself shaped by the contexts in which the narrating happens. A complementary career-development framing comes from John Krumboltz's planned happenstance learning theory (Mitchell, Levin, & Krumboltz, 1999), which treats career-related narrating as the ongoing work of integrating unplanned events into a coherent direction; NBD's workshop is structurally a compressed instance of the planned-happenstance kind of narrative work.

NBD's design treats this empirical regularity as a design opportunity. The workshop is, in McAdams's terms, a *narrating context*, a structured setting in which the student is required to put their identity into language and to revise it under constraint. The constraint is the design instrument. A student left to narrate in unbounded time and space will produce material that is true and unspecific. A student required to narrate within ninety minutes, to compress to a sentence and then to a word, and to defend the word in a small group, will produce material that is more specific because the format does not allow the abstractions that would otherwise paper over the specifics.

The compression operation also engages McAdams's distinction between the *episodic* level of narrative (specific remembered events) and the *thematic* level (the patterns the events instantiate). The first phase of

NBD (the free-form paragraph) operates at the episodic level: students write about specific things they have done. The compression operation forces the move to the thematic level: which patterns do these episodes instantiate, and which pattern is central? The compression is the cognitive operation McAdams treats as the engine of narrative identity development.

2.2 Expressive Writing as Developmental Mechanism

James Pennebaker's (1997) research program on expressive writing provides the second theoretical anchor. Pennebaker and his collaborators demonstrated, across many empirical studies in many populations, that structured writing about emotionally significant experiences produces measurable cognitive, affective, and even physical benefits. The mechanism is not the writing as artifact; the artifact is sometimes discarded. The mechanism is the writing as cognitive operation. The act of putting an experience into language appears to do work that thinking-without-writing does not.

The Pennebaker tradition is methodologically rigorous in ways the broader self-help literature on journaling is not. The original studies used randomized experimental designs, established baselines, and measured outcomes that could be independently verified (immune-system markers, doctor visits, academic performance). The convergent finding across these studies is that the writing has to be of a particular kind: about something the writer genuinely has to think about, sustained for long enough that the surface formulation has time to give way to something deeper, and done multiple times rather than once.

NBD's design borrows the Pennebaker mechanism but adapts the conditions. The workshop is single-session rather than the multi-session structure Pennebaker's original studies used, on the practical ground that a single 90-minute session is what institutional career-services contexts can accommodate. The compression-then-card-sort-then-mirror structure substitutes for the multi-session iteration that Pennebaker's original design provided. The design bet is that the within-session structure can do some of the work that across-session repetition does in Pennebaker's studies; the bet is empirically open and is named explicitly in Section 5.4.

2.3 Productive Gaps as a Design Target

Jack Mezirow's transformative-learning theory (Mezirow, 1997) provides a related theoretical anchor, although one we use with explicit caveats. Mezirow argued that significant adult learning is *transformative*, triggered by what he called a *disorienting dilemma*, in which the learner's existing frames of reference fail to account for an experience and must be revised. We do not claim that NBD produces disorienting dilemmas in the canonical Mezirovian sense; Mezirow reserved that term for life-event-magnitude ruptures (job loss, divorce, illness, encounter with profound otherness) that a 90-minute workshop cannot produce. The smaller-scale phenomenon NBD is designed to engineer is better named a *productive gap*: the cognitively useful disagreement between a learner's articulated self-description and the evidence the learner has just produced about themselves.

A related framework that more directly licenses the NBD design move is the protocol-analysis tradition (Ericsson & Simon, 1993, on think-aloud methods; Wertsch, 1991, on mediated action and inner speech). The shared insight across these traditions is that putting one's reasoning into externalized form, and then attending to the gap between that externalized form and other evidence about the same reasoning, produces cognitive work that pure introspection does not. NBD's compression-then-sort-then-mirror sequence is a structured externalization-and-gap-attention exercise of this kind.

The NBD workshop is engineered to produce a particular kind of productive gap. The student writes a paragraph that names what they think is central to themselves; they complete three card sorts that name what their evidence shows is central; and the AI mirror surfaces the gap between the two. The student who said "I value collaboration" but ranked individual recogni-

tion above teamwork in the values sort has been given a productive gap. The gap is the design feature, not a bug. A workshop in which the AI mirror confirmed the student's stated values would do less developmental work than one in which it productively contradicts them.

The mirror metaphor is important. The AI is not a judge; it does not tell the student which version (the stated one or the evidence one) is correct. The AI surfaces the gap. The student is required to do the resolution work themselves, in the company of their peers, within the session. This design move (described in detail in §4.3) is the deliberate non-substitution of human judgment by machine output, even in cases where machine output could plausibly be produced.

2.4 Generative AI as Scaffolding in Education

The literature on generative AI in education is recent and rapidly evolving. Ethan and Lilach Mollick's (2023) *Assigning AI* paper provides one of the more useful practitioner-facing typologies, identifying seven distinct roles AI can play in instructional settings (tutor, coach, mentor, teammate, tool, simulator, student). The typology is useful because it makes visible that "use AI in education" is not a single design choice but a structured set of choices about *which role* the AI plays in the learning interaction.

The NBD design occupies the *mirror* position, which is not one of Mollick's seven roles but is closest to *coach*: the AI surfaces patterns in what the student has produced but does not direct the student's response to those patterns. The position is not standard in commercial educational AI; most deployed systems occupy the *tutor* or *tool* positions, in which the AI tells the student what to think or do something on behalf of the student. The *mirror* position requires more from the student, because the student must do the interpretation and response work that a tutor would do for them, and it requires more from the AI design, because the system must produce observations that are accurate and uncomfortable without becoming prescriptive.

The most directly comparable contemporary work in this design space is Van Doren, Cai, Han, Ma, Nguyen, and Ahn's (2024) *Careergram*, presented at the International Conference of the Learning Sciences. *Careergram* is an AI-assisted reflection tool that prompts undergraduate students to articulate their occupational identities (using the AXCIS construct framework of self-positioning, competency, social capital, structural opportunities, and navigation; Ahn & Nguyen, 2022) and then to bring the AI-surfaced reflections into structured conversations with their research mentors. The design move is theoretically aligned with NBD's: the AI is positioned as a "mirror and guide, rather than a replacement mentor" (Van Doren et al., 2024, p. 564). The contribution NBD makes against this prior work is in the workshop format (90 minutes rather than a year-long fellowship program), in the compression-and-triangulation operations (paragraph-to-word compression and three-card-sort instruments rather than open-ended reflection prompts), and in the synchronous peer-witness context (dyadic conversation rather than mentor-mentee). The two designs share the underlying mirror-not-advisor commitment and are best read as complementary tests of the same broader design move in different time-and-relational structures.

The literature on generative AI in education has, in parallel with the practitioner-facing work, developed a critical strand we engage with less directly here. Neil Selwyn (2019) and Ben Williamson (2017), among others, have argued that the integration of AI into educational settings tends to reproduce and amplify existing power asymmetries between institutions and learners, often under a rhetoric of personalization or efficiency. The mirror design move is a partial response to that critique, in that it explicitly refuses the advisor and judge positions that import institutional authority into the learner-AI interaction. We do not claim the mirror position resolves the broader critique; the critique applies to any AI integration including this one, and we treat it as a constraint on the design rather than as a problem the design has solved.

The shorter argument is that the *advisor* design move imports a structural failure into a context where the developmental work depends on the student's own judgment. The *mirror* design move preserves the student's judgment by giving them better evidence to apply it to.

3. Method: The Workshop as Research Instrument

Scope and method. This paper documents the workshop's design rationale and intended operations. The workshop has been delivered in facilitator-led prototype runs by the lead author; the artifacts and outputs described below are illustrative of the intended workshop structure rather than data from a formally collected human-subjects study. No IRB-reviewed consent process or research-data substrate is currently in place. The open research lines in §5.4 describe the empirical studies that would require such infrastructure.

NBD is positioned within the design-based research tradition (Brown, 1992; Design-Based Research Collective, 2003), with one methodological extension specific to the workshop format: the workshop itself functions as both an instructional event and a research-data-collection event. Were a consent and data-retention infrastructure to be operationalized in a future cycle, student artifacts (the paragraph, the sentence, the word, the card-sort outputs, the AI mirror's surfaced gaps, and the student's response to the gaps) would constitute a natural data substrate for analyzing how the workshop's design moves do or do not work as intended.

This dual function has methodological consequences. The lab does not need to run a separate study to evaluate the workshop; each workshop session is itself a structured data-generating event. Across multiple cohorts and across multiple workshop iterations, the accumulated artifacts can be analyzed for patterns: do specific compression operations consistently produce specific kinds of disorientation, do specific card-sort combinations consistently reveal specific kinds of gaps, do specific AI mirror surfacings consistently produce productive resolution work.

The methodology has limits the empirical follow-on work will need to address. The workshop population would be self-selecting (students who opt into the workshop), and any future consenting subpopulation may differ from the full workshop population in ways that would need to be addressed at the study-design stage. The within-workshop measurement implied by the design is qualitative rather than quantitative; outcome metrics on conventional career-services scales (placement, time-to-employment) are not directly produced by the workshop format. These limits are described in Section 5.3.

4. The Narrative by Design Workshop

4.1 The Compression Sequence

The first operation in the workshop is the compression sequence. The student writes, in five minutes, an unfiltered paragraph about who they are. The instruction is permissive: there is no expected form, no length minimum, no expectation that the paragraph will be coherent. The paragraph is the raw material.

The student then has five minutes to compress the paragraph to a single sentence. The compression is required to retain what the student considers the central claim of the paragraph; the discarded material is, by the student's own act of discarding, identified as peripheral. The student then has five minutes to compress the sentence to a single word. The word is required to defend itself, in the next operation, against the student's own evidence and against peer questioning.

Each step in the compression strips out material. The stripped-out material is informative: a student who discards "I love teaching" in the compression from paragraph to sentence has told themselves something they could not have told themselves without the compression. The lab's *Compression as a method* field note

documents this design move as it recurs across multiple lab projects; the NBD workshop is its most explicit instantiation.

4.2 The Three Card-Sort Instruments

While the compression sequence is producing the student's articulated direction, the card-sort instruments are producing parallel evidence. The workshop uses three sorts: Knowdell Career Values (40 cards naming core work values), a sort of strength themes drawn from the CliftonStrengths instrument, and Motivated Skills (skills the student is energized by, regardless of whether they are currently good at them). We note in passing that the CliftonStrengths instrument has a contested psychometric reputation (the published reliability and construct-validity evidence is less robust than Gallup's marketing materials suggest); we use it in NBD as an *exploratory* sort rather than as a diagnostic instrument, and the design does not depend on the underlying psychometrics holding up to the standard a clinical assessment would require. Students complete each sort progressively (top 20, top 10, top 5, top 3), with the successive compression itself functioning as data.

The card-sort tradition is methodologically grounded in the knowledge-elicitation literature (Rugg & McGeorge, 1997) and in the long tradition of vocational assessment that has used sort instruments since the early 20th century. The specific instruments NBD uses are commercial (Knowdell, CliftonStrengths) or established (Motivated Skills); the workshop's contribution is not the sorts themselves but the *triangulation* of three sorts that produce evidence in three different registers (values, strengths, skills). The triangulation is the design move.

A single sort produces a result the student can rationalize. Three sorts produce a configuration the student cannot rationalize as easily, because the configuration constrains itself. A student whose top values include collaboration, whose top strengths include independent analysis, and whose top motivated skills include solo synthesis has produced a configuration the student must explain. The explanation is itself developmental work.

4.3 The AI-Mirror Layer

After the compression sequence and the card sorts are complete, the AI mirror reads the student's outputs across all four operations and surfaces the gaps. A representative output, illustrative of the intended prompt-design format: *Your paragraph emphasized X. Your sentence retained Y. Your word foregrounded Z. Your values sort prioritized A. Your strengths sort prioritized B. Your motivated-skills sort prioritized C. The strongest pattern across the four operations is D. The strongest tension is between E and F.*

The mirror does not recommend. The mirror does not interpret. The mirror surfaces the configuration and names the strongest tensions. The student is required to do the interpretation work, in the next phase of the workshop, with their peer pair. The lab's design wager is that the surfaced tensions are the developmental opportunity: the student who is told their stated values and their evidenced values disagree has been handed a productive dilemma that the workshop's remaining time is structured to support them in working on.

The technical implementation of the mirror layer uses large language models (currently GPT-4-class systems) with carefully constrained prompts designed to produce observations rather than recommendations. The prompt design is itself an ongoing research project. The current prompts are written explicitly to prohibit the model from saying things like "you should consider careers in X" or "your real value is Y." The model is required to say things like "the strongest pattern is X" and "the strongest tension is between A and B." This constraint is harder to enforce than it sounds; the model's default behavior is to advise, and most of the prompt-engineering work is preventing it from doing so.

4.4 The 90-Minute Constraint as Design Instrument

The workshop's 90-minute time budget is a deliberate design choice, not a logistical compromise. Three distinct effects depend on the constraint. First, compression forces choices the student would not make if given more time; given two hours, students elaborate, and the developmental work the compression is designed to produce does not happen. Second, the format requires a witness; a 90-minute solo workshop is just journaling, and the format only produces compression-with-witness when the time budget makes solo elaboration impossible. Third, the workshop has to be cheap-to-fail; the student needs to know that doing the workshop badly is recoverable, and a 90-minute exercise is recoverable in a way a multi-week program is not.

The lab's *The 90-minute constraint* field note develops this argument at greater length, including the working observation that scheduling constraints in institutional career-services contexts will press the workshop to expand its time budget, and that the expansion would change what the workshop produces. The constraint is worth defending against the institutional pressures that would relax it.

5. Discussion

5.1 What the Mirror Position Buys

The AI-as-mirror design move, distinguished from the AI-as-advisor default, does specific developmental work that the advisor position cannot. An advisor produces an answer; the answer terminates the student's inquiry. A mirror produces an observation; the observation requires the student to do the inquiry. In a workshop whose developmental goal is the student's capacity for self-authorship (Baxter Magolda, 2001), the mirror is the position that supports the goal; the advisor is the position that short-circuits it.

The mirror position is also distinguished from another commonly proposed AI design move: the *judge* position, in which the AI evaluates the student's outputs against some standard. The judge position imports an authority claim the lab is not willing to make; no available AI system is qualified to judge a student's emerging career narrative against the standard of what the student should be doing. The mirror position makes no such claim. It says: here is what you produced, here is the pattern that produced material shows, here is the tension. The student is the only authority on what to do with the surfaced material.

5.2 Triangulation Reduces Rationalization

The three-card-sort triangulation is a design move whose effectiveness depends on the *configuration constraint* it produces. Any single sort is rationalizable; the student can produce a top-five values list that says what they want to say. Three sorts simultaneously are much harder to rationalize, because the configuration must be internally consistent or visibly inconsistent.

The lab's working observation across multiple workshop runs is that students rarely produce three sorts that are simultaneously rationalized to a clean direction. The most common pattern is two sorts that agree and a third that pulls in a different direction; the third is the surface of the developmental work. The AI mirror's job is to surface the configuration cleanly so the student cannot ignore the tension.

5.3 Limitations of the Current Implementation

The current implementation has limitations the empirical follow-on work will need to address. The workshop has been delivered at a single institution (Dartmouth College) with a specific population (residential undergraduate, mostly traditional age). The peer-pair dynamic that the workshop relies on may function differently in populations where the peers do not already share institutional context.

The 90-minute time constraint has not been controlled-studied against alternative time budgets. The lab's working hypothesis (that 60 minutes is workable, 120 minutes degrades the compression effect) is based

on qualitative observation across iterations, not on measurement. A controlled comparison would clarify the boundary conditions.

The AI mirror's effectiveness depends on the prompt design, and the prompt design is currently single-author. Different prompt designs would produce different mirror outputs; the sensitivity of the workshop's effectiveness to the prompt design has not been measured. The institutional risk of the mirror sliding from observation toward recommendation (the *judge* failure mode) is named in Section 5.4 as an open research line.

The longitudinal effects of the workshop have not been measured. Alumni-track surveys at six-month and two-year intervals are in design but have not been deployed. The lab's working hypothesis is that students return to the compression operation periodically in subsequent career decisions; the hypothesis is testable.

5.4 Open Research Lines

Five lines of inquiry are open at Lo/Be Lab around NBD.

The compression-with-witness mechanism. The lab's field-note hypothesis is that solo compression produces vague material and pair compression produces specific material. The workshop can be configured to run the compression phase in solo and paired conditions in adjacent sessions, with the resulting written outputs compared on dimensions of specificity, defensibility, and student-reported usefulness.

Time-budget calibration. The 90-minute constraint can be varied across workshop runs (60, 90, 120, 180 minutes) with measurement of the resulting compression quality, mirror-surfaced gap usefulness, and student-reported pressure. The empirical question is the boundary conditions of the time-budget effect.

Prompt-design sensitivity. The AI mirror's prompt design can be varied (more conservative vs. more permissive, more observational vs. more interpretive) across workshop runs with measurement of the resulting mirror outputs and student response. The empirical question is whether the prompt design has a measurable effect on the workshop's developmental outcomes or is, within reasonable bounds, ignorable.

Mirror-to-judge slide. The lab's design concern is that the mirror position is easy to slide toward the judge position, both in the AI's outputs and in the student's reception of them. A controlled study could expose students to mirror-output and judge-output versions of identical AI responses, measuring whether the student's response work differs in productive ways.

Longitudinal practice transfer. The workshop is positioned as introducing the student to a practice they will return to periodically. Alumni-track surveys can measure whether graduates report applying the compression-and-triangulation operation to subsequent career decisions, or whether the workshop is experienced as a one-time event.

5.5 NBD Within the Five-Question Frame

Narrative by Design is the shortest-format prototype in the lab's set, deployed in 90-minute sessions rather than across terms. It nevertheless sits within the same five-question research program that organizes the lab's other prototypes. The program is organized around five animating research questions: (RQ1) whether designed environments and guided conversation can support sustained reflection at cohort scale; (RQ2) what design principles support spatial, conversational, and computational tools for sensemaking; (RQ3) whether personal reflection improves group decision-making; (RQ4) how to use AI to surface evidence about a person without replacing their judgment; and (RQ5) what is discipline-specific and what is universal when designing reflection tools for a particular profession.

NBD most directly addresses RQ2 (design principles for conversational tools) and RQ4 (the AI-as-mirror design move). Three prior companion prototypes test other questions: Synapse (Looper, 2025a) and DartWorld (Looper & the DALI Lab, 2025c) test RQ2 in instrument and platform registers; the Career

Design Lab program at Dartmouth (Looper, 2025b) tests RQ1 and RQ3 as a semester-long program. The remaining prototype — Threshold, a discipline-specific career toolkit — is in development as a companion working report in the same series, as is the forthcoming framework paper that articulates the four-part design vocabulary (reflection, interpretation, visualization, action) the lab uses to organize the prototypes. The research program is the unit of analysis; the prototypes are the experiments that test it. The cross-project field notes (notably *Compression as a method*, *AI as mirror, not advisor*, and *The 90-minute constraint*) document patterns that recur across multiple prototypes and develop the design moves the NBD workshop instantiates.

6. Conclusion

We close by recapping the design moves the workshop integrates. Institutional career advising is dominated by formats (the resume, the interview script) that presume what they are designed to produce: a student who already knows what to say about themselves. The developmental gap is upstream of those formats, in the operation of finding the meaningful pattern inside one's own experience. We described Narrative by Design as a workshop response to this gap: a 90-minute facilitated session that produces narrative compression through a three-stage sequence (paragraph to sentence to word), triangulates the result against three card-sort instruments, and uses an AI mirror to surface the gap between the student's articulated direction and the evidence the sorts produce.

The deeper claim is that compression is the developmental operation, the mirror is the developmental device, and the witness is the developmental context. None of the three works in isolation. The contribution NBD attempts is to integrate the three within a tightly time-constrained 90-minute format. We are not aware of an existing institutional career-services tool that integrates all three in this combination, though we acknowledge that any single one (compression, mirror, or witness) has antecedents in other contexts. NBD's design is the integration, not the invention of any of the components.

Lo/Be Lab welcomes collaboration on any of the open research lines described in Section 5.4, particularly from career-development and educational-AI research programs equipped to conduct the controlled studies the design rationale invites. Inquiries can be directed to seth.looper@gmail.com.

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