

# Formative AI Scaffolding: A Framework for Studying AI's Role in Adult Identity and Community Connection

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December 2025

## Abstract

Millions of adults now use AI to navigate major life decisions, yet research on AI scaffolding has focused almost exclusively on educational contexts with predetermined curricula and young learners. This paper proposes *formative AI scaffolding* as a framework for studying AI's role in adult identity formation and life transitions. The framework distinguishes formative scaffolding (AI interaction that prepares adults for membership in human communities of practice, relationship, or purpose) from habit-forming patterns where AI substitutes for, rather than scaffolds toward, human connection. Drawing on educational scaffolding research, developmental psychology, and communities of practice theory, the paper argues that community direction provides a criterion for distinguishing beneficial AI scaffolding from harmful dependency. The framework identifies research directions for computational media and human-computer interaction, including design feature analysis, trajectory studies, and intervention design. The framework is hypothesis-generating: it identifies a phenomenon and proposes a criterion for evaluation, but these claims require empirical testing through the research directions outlined.

## 1 Introduction

Millions of adults now turn to AI when facing major life decisions. They ask whether to change careers, how to navigate a difficult relationship, whether to leave a stable job for an uncertain opportunity. They use AI to think through options, weigh tradeoffs, and imagine possible futures. This isn't a prediction about where technology is headed; it's already happening. Recent surveys suggest that roughly a third of Americans report AI has influenced their career decisions, with about one in ten having already changed careers due to AI-related concerns (Southeastern Oklahoma State University, 2025).

Yet research on AI and human development has focused almost entirely on educational contexts. We know a great deal about how AI can scaffold students through predetermined curricula, helping them master skills that have been identified in advance. We know less about what happens when adults use AI to explore open questions about who they might become.

This gap matters because the two situations are fundamentally different. A student using an AI tutoring system is working toward outcomes that someone else has defined. But an adult asking AI to help them think through a career change is navigating territory where there is no syllabus, no instructor, and no clear endpoint. The questions are existential rather than curricular: not “how do I learn this skill?” but “what kind of life should I build?”

The question this paper explores is what distinguishes AI interaction that is genuinely formative from interaction that is merely habit-forming. Extended engagement with AI systems can *feel* productive. It can *feel* like thinking. But feeling like progress and actually making progress are not the same thing. Some people emerge from sustained AI interaction with expanded capacity, new possibilities, and the preparation to pursue them. Others find themselves in a loop: more conversation, more refinement of the same questions—but all without forward movement.

This paper proposes a criterion for distinguishing formative AI scaffolding from its habit-forming counterpart: community direction. AI scaffolding is formative when it moves people *toward* community. For example, an adult who uses AI to build skills for a career change or develop the confidence to seek out mentors is being scaffolded toward membership in communities of practice. The young adult who uses AI as a substitute for those communities, who finds the AI relationship sufficient in itself, is in a different situation entirely. This concern predates AI (Turkle, 2011, 2015). Digital technologies can offer the feeling of connection while eroding the practices that sustain real relationships. The pattern Turkle identified in smartphones and social media may intensify with conversational AI, which provides not just the sense of being heard but something closer to the experience of dialogue itself.

Media accounts have documented cases where sustained AI interaction appears to have contributed to isolation, deteriorating mental health, and in extreme cases, self-harm (Tong, 2024). Other accounts describe deeply unsettling interactions that raised public concern about AI’s psychological effects (Roose, 2023). If design choices influence whether users move toward human support or away from it, then understanding those choices is urgent.

This distinction has implications for how AI systems are designed. If design choices can push users toward community or away from it, then designers and researchers need to understand which choices matter and how. That is not a question psychology can answer on its own. It is a question about computational systems, about interface decisions and interaction patterns and the affordances that shape what users experience as possible. It belongs to computational media and human-computer interaction.

This paper proposes formative AI scaffolding as a framework for studying these questions. The framework draws a boundary around a phenomenon that millions of people experience but that existing research has not named or examined, and it identifies research directions for understanding what design choices influence which outcome.

## 2 AI Scaffolding in Educational Contexts

The concept of scaffolding in learning contexts originates with Vygotsky's Zone of Proximal Development (Vygotsky, 1978): the gap between what a learner can accomplish independently and what they can accomplish with support from someone more capable. Wood et al. (1976) formalized the scaffolding metaphor, describing how tutors provide temporary structure that enables learners to perform tasks beyond their current ability, then gradually withdraw that support as competence develops. The metaphor has proven durable. Decades of educational research have elaborated how scaffolding works, what makes it effective, and how it can be designed into instructional systems.

With the emergence of intelligent tutoring systems and adaptive learning platforms, researchers began asking whether AI could provide scaffolding that had previously required human instructors. The answer, across many studies, appears to be yes, at least for certain kinds of learning (VanLehn, 2011). AI systems can adapt to individual learners, provide feedback at scale, and offer support that would be impractical for a single teacher serving many students. The literature on AI scaffolding in educational contexts is now substantial.

### 2.1 AI Scaffolding in K-12 Education

Research on AI scaffolding for younger learners has focused primarily on skill acquisition in structured domains. Intelligent tutoring systems for mathematics can identify where students struggle and provide targeted hints (VanLehn, 2011). Writing assistants help students develop essays through iterative feedback. Language learning applications adapt to each learner's pace and provide scaffolded practice with vocabulary and grammar.

Trujillo et al. (2025) reviewed 38 studies on machine learning approaches to student career prediction, finding that most applications focus on matching students to academic pathways based on performance data. The technical sophistication is impressive: neural networks and random forest algorithms can predict student outcomes with high accuracy. Notably, these systems optimize within predefined pathways—they help students succeed at math, not decide whether math is the right path for them. This distinction, while not the focus of Trujillo et al.'s review, points to a limitation relevant to the present framework.

A systematic review of AI-integrated scaffolding in K-12 contexts found similar patterns (Li and Wilson, 2025). The systems reviewed were designed to enhance agency and creativity within curricular boundaries. Students using these tools were learning what someone else had decided they should learn. The AI helped them learn it more effectively.

## 2.2 AI Scaffolding in Higher Education

Research on AI scaffolding in higher education shows some expansion beyond pure skill acquisition, but similar structural constraints. AI writing assistants help students develop academic prose. Research tools help students locate and synthesize sources. Tutoring systems support students through difficult coursework.

The concerns that appear in this literature are instructive. Researchers worry about over-reliance: students who let AI do the thinking rather than developing their own capacity (Kasneci et al., 2023). They debate whether AI enhances or replaces student cognition. They examine how to design systems that support learning without undermining it. These are important questions, and they reflect genuine understanding of what scaffolding is supposed to do. Scaffolding that never fades isn't scaffolding. It's dependency.

But even in higher education contexts, the research examines AI scaffolding for tasks where the outcome is externally defined. The student is trying to pass a course, complete a degree, master a body of knowledge. Instructors and institutions have determined what success looks like. The AI helps students reach goals that someone else has set.

## 2.3 Common Characteristics

Across this literature, AI scaffolding in educational contexts shares several characteristics that distinguish it from other forms of AI assistance.

The learning outcomes are predetermined and externally assessed. Someone has decided what students should learn, and teachers, institutions, and standardized tests evaluate whether they have achieved those goals. Even adaptive systems that personalize the path still aim at destinations that have been fixed in advance.

The timeframe is bounded and institutional. Courses end. Degrees are completed. Scaffolding is expected to fade as students develop competence, and there are institutional mechanisms for determining when that has happened. Students access AI scaffolding through schools and universities that mediate the relationship.

The focus is skill acquisition among young learners. Students are learning to do things: solve problems, write essays, conduct research, speak languages. Identity questions ("what kind of person should I become?") are not the province of these systems. And the overwhelming focus is on children, adolescents, and young adults in formal education. Research on AI scaffolding for adults outside educational contexts is sparse.

## 2.4 What This Literature Offers

The educational AI scaffolding literature has developed important insights that any broader framework should preserve. Researchers in this tradition understand that effective scaffolding supports autonomy rather than replacing it. They have developed ways to think about when AI help is too much and when it's not enough. The concern with over-reliance reflects genuine understanding of what can go wrong when scaffolding doesn't fade. And

the design orientation is useful: this literature asks how systems should be built, not just how users respond to them.

What the literature does not offer is a framework for understanding AI scaffolding outside these institutional, curricular, time-bounded contexts. That leaves a gap, because millions of adults are now using AI in ways that look nothing like what this literature describes.

## 3 The Gap

A traditional literature review would survey existing research on AI's role in adult identity formation and life decisions, synthesizing findings and identifying directions for future work. This paper takes a different approach because that literature largely does not exist. Research on AI scaffolding concentrates on educational contexts with young learners. Research on AI companions addresses mental health and loneliness. Research on career development predates the current wave of generative AI tools. The intersection, how AI shapes adult decision-making about identity and life direction, remains unstudied as a coherent phenomenon. What follows is therefore not a synthesis of existing findings but an argument that a new framework is needed and a proposal for what that framework might look like.

### 3.1 How Adults Actually Use AI

While educational AI scaffolding research focuses on helping students master predetermined curricula, a different use pattern has emerged: adults across all life stages are using AI to navigate questions about identity, direction, and possibility that have no predetermined answers. These are not questions where the right response can be found in a textbook. They are existential questions about who to become and what kind of life to build.

A 28-year-old asks AI to help think through whether to accept a promotion that requires relocating away from family. A 45-year-old professional uses AI to explore whether pivoting from corporate law into environmental advocacy is realistic. A recently divorced parent wonders how to rebuild a social life after twenty years of marriage. The pattern extends beyond career: adults seek AI's assistance with geographic relocation decisions, relationship choices, questions about meaning and purpose, and how to navigate caring for aging parents while raising children.

The scale of this use is significant. Pew Research Center reports that 62% of U.S. adults now interact with AI at least several times a week, with one-third of adults under 30 interacting several times daily (Pew Research Center, 2025). A Deloitte survey found that 32% of early career workers are considering starting their own business or becoming self-employed in response to AI's impact on their fields, while 30% are interested in creating entirely new careers that do not currently exist (Deloitte, 2024). These are not incremental

decisions but fundamental questions about life direction that millions of people are now processing with AI assistance.

The scope of AI use for personal decisions continues to expand. Fang et al. (2025) tracked how people use AI conversational agents for social and emotional support over time, finding that AI tools have evolved from productivity aids to something closer to companion figures that users turn to for advice, comfort, and conversation. The researchers note that this shift must be understood within a broader historical context of individuals adapting to tools that offer convenience while raising new concerns about what those tools do to human relationships.

### **3.2 Why Educational Frameworks Do Not Fit**

The characteristics that define educational AI scaffolding do not apply to how adults use AI for life decisions.

Adults using AI for life decisions have no curriculum, no external assessors, and no bounded timeframe. They are exploring territory where no expert has predetermined what they should learn. They must judge for themselves whether they have thought through something adequately, whether they are ready to act, whether AI's input was helpful or misleading. And the questions they face do not resolve the way a course ends.

Most fundamentally, educational scaffolding focuses on skill acquisition, while life decisions involve forming and revising one's sense of self. When someone uses AI to explore a career change, they are not just acquiring skills; they are actively constructing an identity, questioning who they have been and imagining who they might become. Identity development, value clarification, and exploring purpose are messy processes that continue throughout life. The temporal dimensions of "support" and "success" require reconceptualization.

### **3.3 The Community Question**

A more fundamental distinction emerges when we examine what makes AI interaction actually formative rather than merely habit-forming. Extended engagement with AI can feel productive. It can feel like thinking. But feeling like progress and actually making progress are not the same thing.

The key question is whether AI interaction moves people toward community or away from it.

Consider two patterns. In the first, someone uses AI over months to prepare for a career transition. They research fields, practice articulating their qualifications, work through anxieties, and ultimately take steps to join a professional community they had previously considered inaccessible. The AI scaffolding was formative because it prepared them for membership in human communities. In the second pattern, someone engages in similarly extended AI conversations but never moves toward actual human relationships

or communities. More AI, more conversation, more refinement of the same questions, without forward movement.

This is not simply a question of usage volume. The same number of conversations could be formative or habit-forming depending on whether they build toward community integration or substitute for it.

Recent empirical research supports this distinction. A 2025 study of over 1,100 AI companion users examined multiple dimensions of chatbot use and found that people with fewer human relationships were more likely to seek out AI chatbots, and that heavy emotional self-disclosure to AI was consistently associated with lower wellbeing (Zhang et al., 2025; Fang et al., 2025). A four-week randomized controlled trial found that experimental chatbot features (voice vs. text, conversation types) did not significantly reduce loneliness, while heavy daily use correlated with greater loneliness, dependence, and reduced real-world socializing (Fang et al., 2025).

A 2025 article in *Trends in Cognitive Sciences* examines whether large language model interactions can help solve the loneliness epidemic and concludes that while such interactions may feel socially satisfying in the moment, they cannot satisfy psychological and physical needs for proximity (Montag et al., 2025). The authors argue that addressing loneliness requires societal action, not simulating human relationships with artificial surrogates.

The pattern appears across multiple studies. Research on users of social AI platforms has found that extended engagement can reduce human social contact, reinforcing self-isolating habits (Zhang et al., 2025). Paradoxically, tools designed to alleviate loneliness may intensify it by satisfying social needs just enough to prevent users from seeking deeper relationships (Montag et al., 2025).

### 3.4 The Stakes of Getting This Wrong

The absence of research frameworks for understanding this distinction has real consequences for millions of people.

The dependency risk is significant. Without understanding how AI scaffolding functions for adult development, we cannot distinguish beneficial support from harmful dependency. Does sustained AI use build lasting capability, helping people develop confidence and skills they can apply independently? Or does it create reliance without growth, where people become unable to navigate major decisions without AI involvement? Educational scaffolding research emphasizes “fading,” gradually reducing support as learners develop competence (Wood et al., 1976). No research examines whether or how this might apply to AI scaffolding for life decisions.

The stakes extend to mental health. Psychiatric researchers have begun documenting cases where intense engagement with AI chatbots contributed to delusional thinking or exacerbated mental illness, describing what they call “technological folie à deux”: feedback loops between AI systems and vulnerable users that reinforce harmful patterns (Dohnány et al., 2025). Documented cases include instances where sustained AI interaction appears to have contributed to isolation, deteriorating mental health, and in extreme

cases, self-harm (Tong, 2024). These outcomes likely involve many factors beyond AI design. But if design choices influence whether users move toward human support or away from it, then understanding those choices is urgent.

The influence asymmetry presents another concern. AI systems are designed to be helpful, but “helpful” for life decisions involves complex value judgments. When AI helps someone explore career options, it inevitably emphasizes certain values over others. These emphases may reflect training data, corporate priorities, or implicit values embedded by designers. Adults may not recognize these influences, instead experiencing AI’s framings as neutral information.

The displacement question matters as well. If AI increasingly serves functions traditionally filled by career counselors, therapists, mentors, and advisors, what happens to those professional relationships and institutions? Does AI democratize access to guidance, or does it provide something that feels helpful but lacks what is essential about human wisdom and connection?

### 3.5 A Computational Media Question

These questions are not primarily psychological. They are questions about how AI systems are designed, what affordances they offer, and what patterns of use those design choices encourage.

A psychologist might ask: What cognitive processes occur when adults use AI for identity work? A computational media researcher asks: What design choices push users toward community or isolation? What interface decisions shape what futures feel visible and possible? What system architectures support formative outcomes versus habit-forming loops?

This framing matters because it makes the research actionable. If we can identify which design features, interaction patterns, and system behaviors correlate with users moving toward human community rather than away from it, we can inform how these systems are built. We can distinguish beneficial scaffolding from harmful influence at the level of design rather than leaving individual users to figure out the difference on their own.

The educational AI scaffolding literature provides valuable insights about adaptive support, learner agency, and over-reliance risks. But it cannot answer these questions because they arise from fundamentally different contexts. The next section proposes formative AI scaffolding as a starting point for this research program.

## 4 The Framework

### 4.1 Defining Formative AI Scaffolding

Formative AI scaffolding refers to AI-mediated interaction that prepares adults for membership in human communities of practice, relationship, or purpose. The definition has three components that distinguish it from other forms of AI assistance.

First, the scaffolding is AI-mediated. This distinguishes it from human mentoring, coaching, or counseling, though the framework draws on insights from those traditions. The focus is on computational systems and the design decisions that shape user experience.

Second, it concerns preparation rather than substitution. AI scaffolding is formative when it builds capacity for human connection, not when it replaces human connection. A person who uses AI to rehearse difficult conversations, research unfamiliar professional domains, or develop confidence to approach potential mentors is being prepared. A person who finds AI conversation sufficient in itself, who stops seeking human connection because AI meets their immediate needs, is experiencing something else.

Third, the destination is community. The framework draws on Lave and Wenger (1991) concept of legitimate peripheral participation in communities of practice, further elaborated by Wenger (1998) as groups bound by shared engagement in an activity that matters to members and develops their competence over time. But community here extends beyond professional contexts. It includes communities of relationship (the networks of family, friendship, and intimacy that constitute a life), communities of purpose (groups organized around shared meaning, whether religious, political, creative, or civic), and communities of care (the relationships through which people support one another's well-being).

## 4.2 The Community Criterion

Why community? A reviewer might reasonably propose alternative criteria:

- *Autonomy*: does AI interaction enhance the user's capacity for self-directed action?
- *Self-efficacy*: does it build confidence in one's ability to achieve goals?
- *Subjective wellbeing*: does it improve how people feel about their lives?

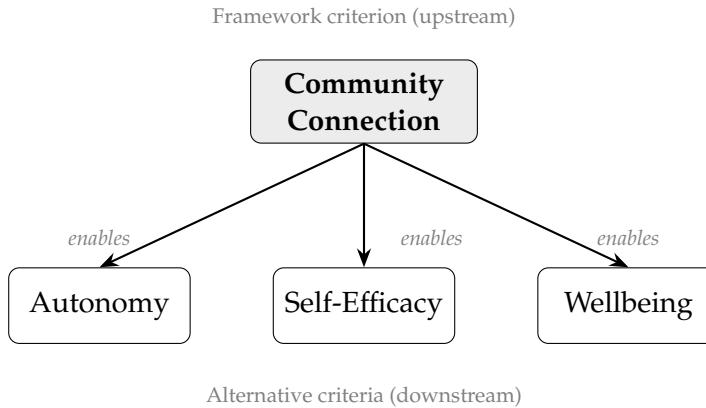
Each of these is measurable, grounded in established psychological research, and plausibly relevant to evaluating AI scaffolding. This framework foregrounds community not because these alternatives are unimportant, but because evidence suggests community connection is *upstream* of them. It is a foundational condition that enables the others rather than one good among equals.

Several theoretical traditions converge on this claim. Self-Determination Theory identifies autonomy, competence, and relatedness as basic psychological needs, but Ryan and Deci (2000) describe relatedness as a "secure base" for intrinsic motivation: people are more likely to explore, take risks, and develop autonomous self-regulation when they experience stable social connection. Relatedness is not merely another need to be satisfied; it is the condition under which autonomy develops and functions. The Belongingness Hypothesis (Baumeister and Leary, 1995) goes further, arguing that self-esteem functions as a "sociometer," a gauge of one's perceived social acceptance rather than an independent psychological resource (Leary and Baumeister, 2000). If self-esteem tracks social acceptance, then interventions targeting self-esteem directly may address a downstream indicator rather than its source. Contemporary flourishing theory reaches

similar conclusions: Fowers et al. (2024) argue that “relational embeddedness is not an aspect of flourishing but its substrate.”

Empirical research supports this ordering. Cross-lagged panel studies show that community participation predicts future psychological empowerment while the reverse pathway is weaker (Christens and Peterson, 2012; Zimmerman and Rappaport, 1988). But the most important evidence for evaluating AI scaffolding concerns what happens when gains in autonomy or self-efficacy are not embedded in community contexts. Warner et al. (2011), studying older adults with chronic illness, found that those high in self-efficacy but low in social connectedness showed declining wellbeing over time. Self-efficacy alone was insufficient to sustain flourishing. Biron and Bamberger (2010) found that when autonomy and self-efficacy were high but peer and organizational connectedness were low, wellbeing outcomes declined within six months. The gains eroded without relational grounding. If AI scaffolding builds self-efficacy or autonomy without facilitating movement toward community, these findings suggest those gains will be temporary.

If the community criterion is correct, several predictions follow. Users who take concrete steps toward community membership should show declining AI usage in that domain over time, as community resources replace AI scaffolding. Users stuck in habit-forming patterns should show stable or increasing usage without corresponding community participation. Gains in self-efficacy developed through AI interaction should persist longer when accompanied by community integration than when they remain AI-contained. AI design features that explicitly prompt community direction should produce better long-term outcomes than features optimized purely for engagement or user satisfaction. These predictions are testable. If they fail, the framework requires revision.



**Figure 1:** Community connection as upstream of alternative evaluation criteria. Evidence suggests that autonomy, self-efficacy, and wellbeing depend on relational embeddedness rather than existing independently of it.

But what about people who genuinely benefit from AI as a primary relationship, particularly those for whom human community has been inaccessible or harmful? The framework does not deny that AI interaction can provide value for isolated individuals. It asks whether that interaction builds toward expanded human connection or becomes a substitute for it. A person with social anxiety who uses AI to practice social skills and then

engages more confidently with people is experiencing formative scaffolding. A person who finds AI easier than people and progressively withdraws from human contact is in a different situation, even if both report equivalent satisfaction with their AI use. The evidence reviewed above suggests the second person's gains are less likely to persist.

None of this is a claim that solitude has no value, or that all AI use should be instrumental. The claim is about what distinguishes genuinely formative development from activities that merely feel developmental. The person who uses solitude and AI to prepare for richer community participation is in a different situation than the person whose engagement with AI becomes a substitute for the relationships that human flourishing requires.

### 4.3 Distinguishing Formative from Habit-Forming

The distinction between formative and habit-forming AI scaffolding is not about usage patterns alone. It is about trajectory. Formative AI scaffolding follows an open trajectory: AI interaction builds capacity, confidence, or preparation that the person then deploys in human contexts. The person joins a professional community, seeks out a mentor, rebuilds a relationship, or takes steps toward a new identity that involves other people.

Several features distinguish formative from habit-forming patterns:

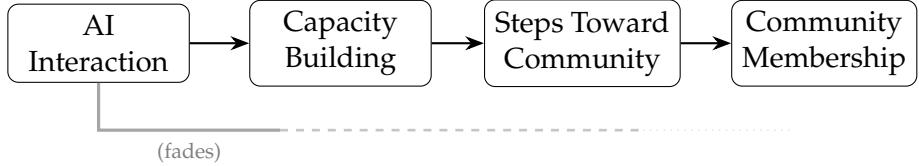
Temporal direction matters. Formative scaffolding has an outward orientation, pointing toward future community participation. Habit-forming interaction circles back on itself, with each conversation primarily setting up the next.

Transfer is a key indicator. Does capacity developed in AI interaction show up in human contexts? Can the person articulate their goals to a colleague, not just to AI? Can they navigate difficult conversations with people, not just rehearse them with a system? Transfer to human contexts suggests formative scaffolding. Capacity that only appears in AI contexts suggests something else.

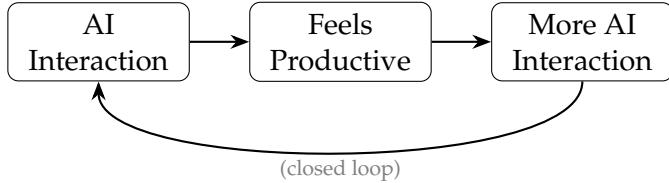
Fading should occur. Educational scaffolding research emphasizes that scaffolding should withdraw as learner competence develops (Wood et al., 1976). Formative AI scaffolding should similarly fade. But the mechanism of fading in AI contexts differs from human tutoring, where a teacher consciously reduces support. With AI, fading might occur through user-initiated disengagement as confidence grows, through natural displacement as community membership provides what AI once offered, or through system design that prompts transition to human support at appropriate moments. The question of how fading happens, and what design choices support or impede it, is central to the framework. If the person's need for AI support in a domain remains constant or increases over time without corresponding growth in their ability to operate independently or connect with relevant communities, the scaffolding may have become dependency.

The relationship to vulnerability matters as well. Formative scaffolding may help people through vulnerable periods by preparing them for support they will seek from others. Habit-forming patterns may exploit vulnerability, offering just enough connection to prevent the person from seeking what they actually need.

### Formative Trajectory



### Habit-Forming Trajectory



**Figure 2:** Formative vs. habit-forming AI scaffolding trajectories. Formative scaffolding follows an open trajectory toward community membership, with AI support fading over time. Habit-forming patterns create a closed loop where AI interaction substitutes for community connection.

## 4.4 The Design Orientation

A computational media framing asks what design choices influence whether AI scaffolding is formative or habit-forming. This is not a question about user psychology alone. It is a question about system architecture, interaction design, and the affordances that shape what users experience as possible.

Consider how interface decisions might matter. An AI system that periodically asks users what human communities they are preparing to join embeds a different orientation than one that never surfaces the question. A system that tracks whether users are taking steps toward community participation and adapts its scaffolding accordingly operates differently than one that treats each conversation as isolated. A system designed to recognize when a user might benefit from human support and facilitate that transition differs from one optimized purely for engagement.

These are not hypothetical examples. They represent design choices that AI developers make, explicitly or implicitly, that influence user trajectories. Currently, most consumer AI systems are designed for engagement without systematic attention to whether that engagement moves users toward or away from human community. The formative AI scaffolding framework suggests this is a design variable that matters.

The design orientation also implies that responsibility for outcomes is distributed. Individual users make choices about how they engage with AI. But designers make choices about what kinds of engagement the system encourages, makes visible, or obscures. A framework focused only on user behavior misses half the picture. A computational media framework asks how system design and user behavior interact to produce outcomes.

## 4.5 Relationship to Existing Concepts

The formative AI scaffolding framework builds on existing work while addressing a gap that existing frameworks do not fill.

From educational scaffolding research, the framework inherits the emphasis on temporary support that builds capacity and then fades (Wood et al., 1976). It preserves the insight that scaffolding should enhance agency rather than replace it, and the concern with over-reliance. What it adds is a context and criterion appropriate for adult life decisions: unbounded duration, self-directed goals, identity formation, and community as the marker of formative value.

From developmental psychology, the framework inherits the understanding that identity emerges through relational participation. It draws on Lave and Wenger's (1991) communities of practice, Erikson's (1968) stages of development, and contemporary work on emerging adulthood. What it adds is attention to how AI systems mediate these developmental processes and the design questions that follow.

From HCI and computational media, the framework inherits the focus on design as a site of intervention. It treats AI systems not as neutral tools but as designed artifacts that shape user experience in ways that can be examined and modified. What it adds is a specific criterion for evaluating AI design in the context of adult development: does the design push users toward community or away from it?

The framework does not replace these existing perspectives. It synthesizes them in a way that addresses a phenomenon that none of them directly examines: the widespread use of AI for adult life decisions and identity exploration, and the urgent need to distinguish beneficial scaffolding from harmful dependency at the level of design.

The framework also intersects with philosophy of technology traditions. Postphenomenology (Ihde, 1990; Verbeek, 2005) examines how technologies mediate human experience rather than serving as neutral tools. This lens is compatible with the present framework: AI systems mediate adults' relationship to possibility and community, shaping what futures feel accessible. The extended mind thesis (Clark and Chalmers, 1998) suggests cognitive processes can extend into technological environments. AI scaffolding might be understood as such an extension, but the formative/habit-forming distinction asks whether that extension builds toward human community or substitutes for it. The framework thus adds a developmental and relational criterion to these traditions: not just *how* AI mediates, but *toward what*.

## 5 Research Directions

The formative AI scaffolding framework opens several research directions. What follows is not a fixed agenda but a set of questions that computational media and HCI researchers are positioned to address. The organizing principle throughout is the community criterion: which design choices, interaction patterns, and system behaviors correlate with users moving toward human community rather than away from it?

## 5.1 Design Feature Analysis

A first direction examines how specific design features influence user trajectories. Current AI systems differ in ways that may matter for whether scaffolding is formative or habit-forming, but these differences have not been systematically studied with community direction as an outcome variable.

Consider conversational persistence. Some AI systems maintain extended memory across sessions, building what feels like an ongoing relationship. Others treat each conversation as isolated. How does persistence affect whether users move toward human community or settle into AI as sufficient? Persistent memory might help users develop and then act on intentions formed over time. Or it might make the AI relationship feel substantial enough to substitute for human connection. The direction of the effect is an empirical question.

Consider how systems handle emotional disclosure. When users share vulnerable content, AI systems respond in different ways. Some validate and reflect. Some redirect toward professional resources. Some simply continue the conversation. These design choices may influence whether users process difficult emotions in preparation for human support or come to prefer AI's consistent, unchallenging presence. A system that responds to disclosure with "Have you considered talking to someone you trust about this?" embeds a different trajectory than one that simply provides more validation.

The contrast between formative and habit-forming design can be concrete. A "continue this conversation" prompt after a session might support reflection and eventual action, or it might primarily drive return engagement. A feature that asks "What step will you take this week toward the community you've been exploring?" differs from one that asks "What else would you like to discuss?" Both are helpful framings; they point in different directions.

Consider what futures systems make visible. When users explore career possibilities or life changes, AI responses emphasize certain options over others. The affordances of the interface shape what feels possible. Research could examine how these framings influence not just what users consider but whether they take steps toward communities associated with those possibilities.

Methodologically, this direction might involve comparative analysis across platforms, controlled experiments varying specific features, or detailed examination of how design choices are made and what assumptions they embed. The goal is to identify which features matter and how, building an empirical foundation for design guidance.

## 5.2 Trajectory Studies

A second direction tracks user trajectories over time. The distinction between formative and habit-forming scaffolding is fundamentally longitudinal. It concerns where people end up, not just what they do in any single session.

This research would follow adults who use AI for life decisions over extended periods, examining whether and how their patterns of use relate to community participation. The author's own experience during a career transition suggests that such trajectories are legible in retrospect: some conversation clusters clearly built toward specific community-oriented actions (preparing application materials, rehearsing professional conversations, researching unfamiliar fields), while others circled without clear direction. Systematic research could examine whether such patterns generalize and what predicts which trajectory a user follows.

The methodological challenges are significant. Self-selection complicates causal inference: people already oriented toward community may use AI differently than those inclined toward isolation. Measuring "community participation" requires careful operationalization. The timeframes that matter may extend beyond what typical studies can capture.

But the questions are tractable. Mixed-methods approaches could combine quantitative tracking of usage patterns and community indicators with qualitative investigation of how users experience their AI engagement and its relationship to their human connections. Longitudinal designs, even over months rather than years, could reveal trajectories that cross-sectional studies miss.

### 5.3 Transition Point Analysis

A third direction focuses on transition points: moments when users move from AI interaction toward human community, or moments when they might have but did not.

Formative scaffolding, by definition, opens onto community. Somewhere in the process, the person stops relying primarily on AI and starts engaging with people. What happens at that transition? What prompts it? What AI behaviors support or hinder it?

Research in this direction might examine users who successfully used AI to prepare for a career change, graduate program, or new professional community. How did they know when to shift from AI preparation to human engagement? What did AI do that helped? What might have helped more?

Equally valuable would be examining cases where the transition did not occur. Users who engaged extensively with AI around a life decision but never moved toward action or community represent the habit-forming pattern the framework identifies. Understanding what happened in those cases, including both user factors and design factors, could reveal intervention points.

This research could draw on retrospective interviews, diary studies during active transitions, or analysis of interaction logs from users who consent to share them. The goal is to understand the transition from AI scaffolding to community participation at a granular level, identifying what makes that transition more or less likely to occur.

## 5.4 Intervention Design

A fourth direction moves from description to design. If certain features, patterns, or transition supports correlate with formative outcomes, can systems be designed to promote those outcomes more reliably?

This is where the computational media framing matters most. The point is not just to understand what happens but to inform what should be built. Research in this direction would prototype and test design interventions intended to support formative scaffolding.

Possibilities are numerous. Systems might periodically surface questions about users' community intentions, making the trajectory explicit rather than leaving it implicit. Systems might track whether users report taking steps toward human connection and adapt their scaffolding accordingly. Systems might recognize patterns associated with closed loops and offer gentle redirections. Systems might facilitate handoffs to human professionals, communities, or resources when appropriate.

Each of these represents a design hypothesis that could be tested. The formative AI scaffolding framework provides the criterion for evaluation: does the intervention increase movement toward community? Implementation details would vary, but the research program would build knowledge about what kinds of design interventions have what kinds of effects.

## 5.5 Scope and Limitations

These directions do not exhaust the research possibilities, and each faces constraints worth acknowledging.

Access to user data and platform internals is limited for researchers outside the companies that build these systems. Studies may rely on self-report, which introduces biases. The community criterion, while theoretically grounded, requires operationalization that may vary across contexts. Ethical considerations arise when studying vulnerable populations or when interventions might influence significant life decisions.

Validating the framework will require mixed-methods approaches. Longitudinal studies tracking user behavior over months, not single sessions, can reveal whether AI use correlates with changes in community participation. Qualitative interviews with adults who use AI for life decisions can surface the mechanisms by which design features shape trajectories. Analysis of interaction logs from consenting users can identify patterns associated with movement toward or away from human support. These methods are established in HCI research on technology and wellbeing, and adapting them to the formative scaffolding question is methodologically tractable even if logically demanding.

The framework also does not claim that all AI use should be oriented toward community. People use AI for entertainment, productivity, creative exploration, and many purposes where the community criterion does not apply. The framework addresses a specific phenomenon: adults using AI to navigate major life decisions and identity questions.

Within that scope, the community criterion provides a basis for distinguishing beneficial scaffolding from harmful dependency.

A further scope limitation concerns what AI interaction can provide. Human relationships involve embodied dimensions that text or voice interaction cannot replicate: physical presence, touch, physiological co-regulation, the neurochemical processes associated with in-person connection. The framework addresses cognitive scaffolding, the semantic and reflective dimensions of preparing for community participation. It does not claim that AI can substitute for the embodied aspects of human relationship, nor should formative scaffolding be evaluated against that standard. The question is whether AI interaction in the cognitive domain supports or undermines movement toward the embodied relationships that human flourishing requires.

## 6 Conclusion

Millions of adults now use AI to navigate major life decisions. They explore career changes, relationship questions, and fundamental uncertainties about who they might become. This is not a future scenario. It is current reality, and it is largely unstudied.

The research frameworks we have do not fit. Educational AI scaffolding research addresses predetermined curricula, external assessment, and bounded timeframes. Adults using AI for life decisions operate without these structures. The phenomenon requires its own framework.

This paper has proposed formative AI scaffolding as a starting point. The framework offers a definition grounded in a specific criterion: AI scaffolding is formative when it prepares people for membership in human communities rather than substituting for them. Human development occurs in relational contexts; identity emerges through participation, recognition, and engagement with others. AI interaction that supports movement toward community supports development. AI interaction that substitutes for community represents a different phenomenon.

The framework matters because design choices influence outcomes. Interface decisions, interaction patterns, and system architectures shape what users experience as possible. If some design choices push users toward community while others push them toward isolation, then understanding those choices matters for how these systems are built.

The research directions outlined here are tractable. We can study how specific design features correlate with user trajectories. We can track adults over time. We can examine transition points. We can prototype and test interventions. None of this requires waiting for new technologies or new methods.

If the evidence reviewed here is correct, and if human flourishing depends on relational embeddedness, and if gains in autonomy or self-efficacy erode without community grounding, then the design of AI systems is not merely a technical matter. Developers who build systems that millions of people use for life decisions carry some responsibility for whether those systems scaffold users toward human community or substitute for it. This does not

mean AI companies should dictate users' life choices. It means that community direction is not only a developmental metric but an ethical consideration that belongs in design conversations alongside engagement, safety, and user satisfaction.

This paper proposes a framework for asking questions that millions of people's experiences raise but that existing research does not address. The framework is hypothesis-generating: it identifies a phenomenon and proposes a criterion for distinguishing beneficial from harmful AI interaction, but these claims require empirical testing. The framework may require revision (or, rejection) as empirical work proceeds. But the phenomenon is real, the gap in existing research is clear, and the need for investigation is immediate. Adults are using AI to decide who to become. Understanding what that means, and what it should mean, is work worth doing.

## References

- Baumeister, R. F. and Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3):497–529.
- Biron, M. and Bamberger, P. (2010). The impact of structural empowerment on individual well-being and performance: Taking agent preferences, self-efficacy and operational constraints into account. *Human Relations*, 63(2):163–191.
- Christens, B. D. and Peterson, N. A. (2012). The role of empowerment in youth development: A study of sociopolitical control as mediator of ecological systems' influence on developmental outcomes. *Journal of Youth and Adolescence*, 41(5):623–635.
- Clark, A. and Chalmers, D. (1998). The extended mind. *Analysis*, 58(1):7–19.
- Deloitte (2024). Ai is likely to impact careers. how can organizations help build a resilient early career workforce? *Deloitte Insights*.
- Dohnány, S., Kurth-Nelson, Z., Spens, E., Luettgau, L., Reid, A., Gabriel, I., Summerfield, C., Shanahan, M., and Nour, M. M. (2025). Technological folie à deux: Feedback loops between AI chatbots and mental illness. *arXiv preprint arXiv:2507.19218*.
- Erikson, E. H. (1968). *Identity: Youth and Crisis*. W. W. Norton & Company.
- Fang, C. M., Liu, A. R., Danry, V., Lee, E., Chan, S. W. T., Pataranutaporn, P., Maes, P., Phang, J., Lampe, M., Ahmad, L., and Agarwal, S. (2025). How AI and human behaviors shape psychosocial effects of extended chatbot use: A longitudinal randomized controlled study. *arXiv preprint arXiv:2503.17473*.
- Fowers, B. J., Novak, L. F., Calder, A. J., and Kiknadze, N. C. (2024). Can a theory of human flourishing be formulated? toward a science of flourishing. *Review of General Psychology*.
- Ihde, D. (1990). *Technology and the Lifeworld: From Garden to Earth*. Indiana University Press.

- Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günemann, S., Hüllermeier, E., Kruber, S., Kuber, G., Leemann, T., Ratcliff, J., Sailer, M., Schmidt, A., Seidel, T., Stadler, M., Weller, J., Kuhn, J., and Kasneci, G. (2023). ChatGPT for good? on opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103:102274.
- Lave, J. and Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press.
- Leary, M. R. and Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In Zanna, M. P., editor, *Advances in Experimental Social Psychology*, volume 32, pages 1–62. Academic Press.
- Li, M. and Wilson, J. (2025). AI-integrated scaffolding to enhance agency and creativity in K-12 English language learners: A systematic review. *Information*, 16(7):519.
- Montag, C., Spapé, M., and Becker, B. (2025). Can AI really help solve the loneliness epidemic? *Trends in Cognitive Sciences*, 29(10):869–871.
- Pew Research Center (2025). How Americans view AI and its impact on people and society.
- Roose, K. (2023). A conversation with Bing's chatbot left me deeply unsettled. *The New York Times*.
- Ryan, R. M. and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1):68–78.
- Southeastern Oklahoma State University (2025). Career crossroads in the age of AI.
- Tong, A. (2024). Mother sues AI chatbot company Character.AI, Google over son's suicide. *Reuters*.
- Trujillo, F., Pozo, M., and Suntaxi, G. (2025). Artificial intelligence in education: A systematic literature review of machine learning approaches in student career prediction. *Journal of Technology and Science Education*, 15(1):162–185.
- Turkle, S. (2011). *Alone Together: Why We Expect More from Technology and Less from Each Other*. Basic Books.
- Turkle, S. (2015). *Reclaiming Conversation: The Power of Talk in a Digital Age*. Penguin Press.
- VanLehn, K. (2011). The relative effectiveness of human tutoring, intelligent tutoring systems, and other tutoring systems. *Educational Psychologist*, 46(4):197–221.
- Verbeek, P.-P. (2005). *What Things Do: Philosophical Reflections on Technology, Agency, and Design*. Pennsylvania State University Press.

- Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.
- Warner, L. M., Ziegelmann, J. P., Schüz, B., Wurm, S., Tesch-Römer, C., and Schwarzer, R. (2011). Maintaining autonomy despite multimorbidity: Self-efficacy and the two faces of social support. *European Journal of Ageing*, 8(1):3–12.
- Wenger, E. (1998). *Communities of Practice: Learning, Meaning, and Identity*. Cambridge University Press.
- Wood, D., Bruner, J. S., and Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17(2):89–100.
- Zhang, Y., Zhao, D., Hancock, J. T., Kraut, R., and Yang, D. (2025). The rise of AI companions: How human-chatbot relationships influence well-being. *arXiv preprint arXiv:2506.12605*.
- Zimmerman, M. A. and Rappaport, J. (1988). Citizen participation, perceived control, and psychological empowerment. *American Journal of Community Psychology*, 16(5):725–750.