

CAREER COMPASS: AN AI-SUPPORTED FRAMEWORK FOR CONTINUOUS INTERPERSONAL COMPETENCY DEVELOPMENT

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ABSTRACT *The increasing integration of artificial intelligence into education and career development creates new opportunities to move beyond static competency assessment toward continuous, personalized learning. Building upon the previously proposed System of Career Success in the Digital Age, this paper presents Career Compass an AI-based framework that operationalizes the conceptual model into a structured process for developing interpersonal career competencies. Rather than treating assessment as a one-time measurement, the proposed system transforms it into an iterative developmental journey supported by artificial intelligence.*

The framework focuses on four core competencies - Empathy, Collaboration, Networking, and Leadership and guides users through a continuous development cycle consisting of motivation, self-assessment, AI-driven competency analysis, personalized goal setting, competency-focused coaching, micro-learning tasks, structured reflection, automated progress estimation, and periodic reassessment. The AI component functions not merely as a conversational assistant but as an adaptive career coach that interprets assessment data, generates personalized recommendations, facilitates behavioral reflection, and supports competency growth over time.

The proposed process introduces the concept of a Growth Journey Layer, which connects competency assessment with continuous AI-supported development. This layer enables dynamic adaptation of learning activities according to the user's evolving competency profile while preserving a complete history of progress. Consequently, the platform shifts the role of AI from an information provider toward an active facilitator of measurable professional development.

The contribution of this paper is threefold: (1) it operationalizes the conceptual System of Career Success into an AI-supported methodological framework and technological process; (2) it introduces a structured methodology for continuous competency development through iterative coaching and reflection; and (3) it proposes an architecture suitable for implementation in higher education and organizational learning environments. Future empirical studies will evaluate the effectiveness of the framework in supporting long-term competency growth.

Keywords: career development, artificial intelligence, interpersonal competencies, career coaching, competency assessment, higher education, agentic AI, lifelong learning

1. INTRODUCTUON

Artificial intelligence (AI) is rapidly transforming educational and professional development by enabling increasingly personalized learning experiences [1]. While recent advances have substantially improved adaptive learning environments, and career guidance platforms, relatively little attention has been devoted to AI-supported continuous development of interpersonal competencies. Unlike technical competencies, interpersonal competencies including empathy, collaboration, networking, and leadership cannot be effectively developed through one-time instruction or static assessment. They emerge through repeated behavioral practice, contextual experience, reflective thinking, and continuous feedback. Consequently, traditional psychometric approaches provide only a snapshot of an individual's competency profile rather than supporting its long-term development [2].

This paper presents an AI-supported methodological framework for continuous interpersonal competency development, operationalized through the Career Compass prototype. Rather than proposing another AI-based career guidance application, the framework introduces a structured developmental methodology integrating self-assessment, AI-assisted competency analysis, personalized coaching, micro-learning activities, behavioral reflection, automated progress estimation, and iterative reassessment into a continuous development cycle.

The proposed framework is grounded in the previously presented System for Career Success [3], which conceptualizes career development through four core interpersonal competencies: Empathy, Collaboration, Networking, and Leadership. Career Compass represents the first technological implementation of this methodology, demonstrating how recent advances in large language models (LLMs) can support continuous competency development while preserving learner autonomy and reflective decision-making.

Rather than replacing educators, career counsellors, or organizational mentors, the framework is intended to complement existing educational and professional development practices by providing scalable, personalized, AI-supported developmental guidance [4].

2. FROM STATIC ASSESSMENT TO CONTINUOUS COMPETENCY DEVELOPMENT

Traditional career guidance systems and psychometric assessment instruments primarily rely on one-time measurements of learner characteristics [5]. Recent machine-learning approaches have demonstrated promising results in matching competency profiles with labor market requirements and predicting career trajectories [6]. Nevertheless, these systems generally evaluate competencies as static variables and provide limited support for their continuous development.

Recent educational research increasingly advocates continuous competency assessment, in which evaluation functions as an integral component of the learning process rather than merely measuring learning outcomes [7]. Iterative assessment models suggest that competency measurement should provide formative feedback capable of guiding subsequent learning and behavioral change.

In addition it could be pointed out that most AI-supported career systems concentrate on recommendation engines, career prediction, competency matching, and automated résumé analysis. The emergence of LLMs has significantly expanded these capabilities by enabling automated competency interpretation, skills-gap analysis, personalized feedback, and natural language interaction [8].

Despite these advances, most existing systems remain predominantly reactive. They respond to user requests but rarely support continuous competency development through iterative coaching and behavioral change.

3. AGENTIC AI, COACHING, AND REFLECTIVE LEARNING

A growing body of research investigates the evolution of AI from an information provider into an active coaching partner. Studies on Human-AI Co-Agency argue that effective AI-supported learning requires systems capable of maintaining meaningful dialogue, stimulating reflection, and adapting recommendations according to learner progress [9].

Similarly, recent research on metacognition demonstrates that structured behavioral reflection substantially enhances learning outcomes by encouraging learners to analyze their experiences instead of merely consuming information [10].

As technical competencies become increasingly dynamic, interpersonal competencies have emerged as essential determinants of employability, adaptability, and sustainable career success.

Competencies such as empathy, collaboration, networking, and leadership develop gradually through authentic social interaction and reflective practice. Consequently, they are considerably more difficult to assess and develop using traditional psychometric methods alone.

The proposed methodological framework is operationalised through the Career Compass prototype, which consists of three complementary architectural layers presented in figure 1.

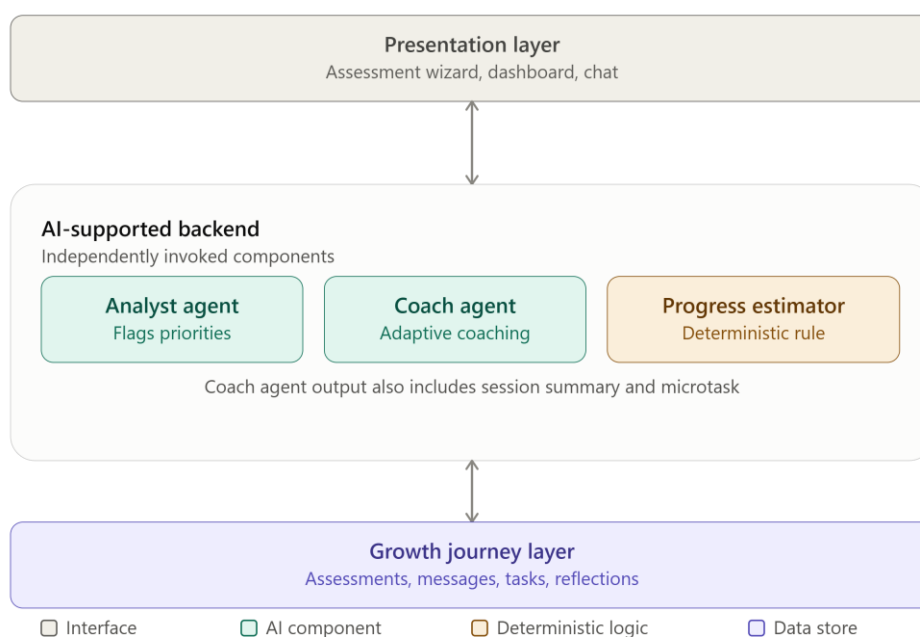


Figure 1. Career Compass - methodological framework of AI-supported backend

1. The Presentation Layer provides responsive web-based user interaction and can potentially integrate with Learning Management Systems (LMS) and organisational learning platforms.

2. The Growth Journey Layer maintains the evolving competency profile of each learner by storing assessment history, coaching conversations, completed developmental activities, and reflective journals.

3. The AI-Supported Backend coordinates two specialised components - one responsible for competency analysis and one for personalised coaching. Micro-task generation is produced as an integrated output of the coaching component rather than by an independently orchestrated generation function, and behavioural progress following task completion is currently estimated through a deterministic scoring rule based on the learner's self-reported task difficulty, rather than through automated analysis of reflection content. Together, these layers support continuous rather than episodic competency development.

4. OPERATIONALISING CONTINUOUS GROWTH: THE NINE-PHASE CYCLE

Rather than treating competency evaluation as a one-time psychometric diagnosis, the proposed framework operationalises continuous interpersonal development through a nine-phase, closed-loop developmental cycle presented in figure 2. Each phase serves a specific pedagogical and technological function, moving the learner sequentially from initial awareness to reflective behavioural change and longitudinal profile updates within the Growth Journey Layer.

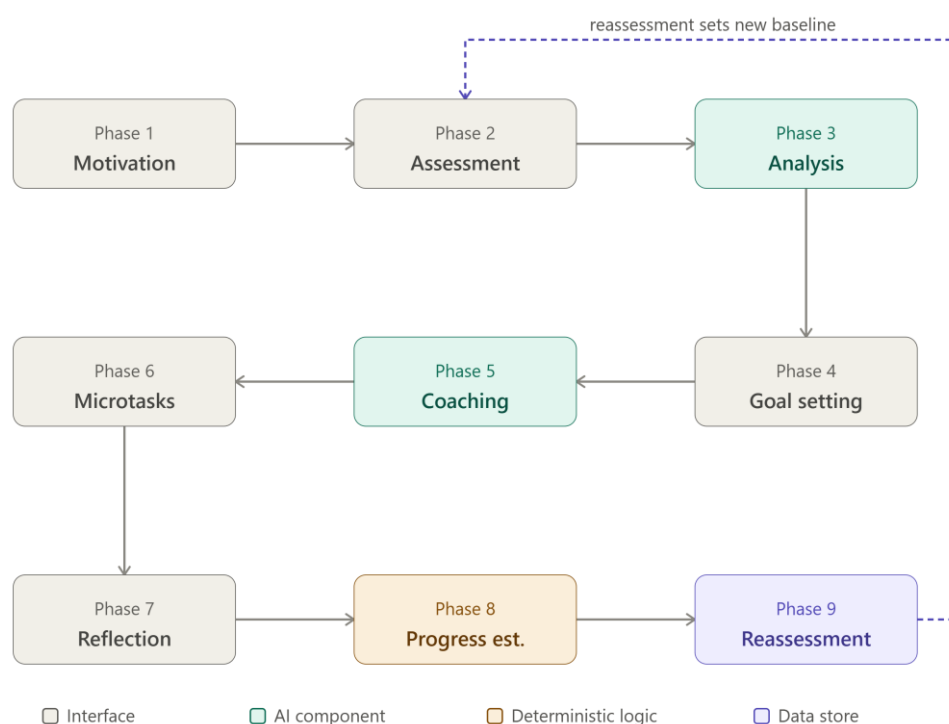


Figure 2. The nine-phase logic of AI-supported methodological framework

Phase 1: Motivation and Learner Activation Objective: Establish readiness for self-development and orient the user toward the learning experience.

Process: The system introduces the four core interpersonal competencies-Empathy, Collaboration, Networking, and Leadership-outlining their relevance to career success in a digital ecosystem. The learner engages with contextual scenarios that contextualise why interpersonal growth is essential for their specific professional aspirations.

Phase 2: Diagnostic Self-Assessment Objective: Capture the learner's initial baseline across the four core competencies through a structured quantitative instrument.

Process: The learner completes a 20-item self-assessment (five items per competency), rating each item on a discrete scale via a single-item-per-screen wizard interface. Each competency score is computed as the arithmetic mean of its five item ratings and mapped onto a four-level scale (Beginner, Developing, Confident, Master). Once submitted, this baseline is recorded as a fixed reference point rather than left open to revision: the assessment instrument is locked after first completion, and subsequent development is tracked as measured movement away from this baseline rather than through repeated free-form self-assessment. Capturing qualitative elements such as self-perceived strengths or recent real-world application scenarios alongside the quantitative baseline is identified as a direction for future refinement of the instrument.

Phase 3: AI-Supported Competency Analysis Objective: Synthesise diagnostic input into a nuanced, context-aware competency profile.

Process: The Analyst Agent processes the self-assessment data using Natural Language Processing (NLP). It identifies implicit competency gaps, detects potential cognitive biases in self-perception (e.g., overconfidence or underestimation), and maps responses against target professional benchmarks.

Phase 4: Personalised Goal Setting Objective: Define an actionable developmental focus grounded in the diagnostic profile.

Process: Guided by the Analyst Agent's recommendations, the user formulates a developmental goal, either by selecting from framework-suggested options or by specifying one in free text (e.g., "Improve active listening in cross-functional team meetings"). At the current stage of implementation, goal formulation does not undergo automated validation against SMART criteria; ensuring that a goal is specific, measurable, actionable, relevant, and time-bound remains the learner's responsibility, while maintaining learner agency over goal selection. Structured SMART validation of submitted goals is identified as a planned enhancement to this phase.

Phase 5: Competency-Focused AI Coaching Objective: Facilitate active problem-solving and critical self-reflection through dialogue.

Process: The Coach Agent engages the user in dynamic, conversational coaching sessions. Utilizing adaptive Socratic questioning, the agent challenges assumptions, helps unpack complex interpersonal workplace scenarios, and guides the learner toward developing practical behavioral strategies.

Phase 6: Micro-Learning Activities Objective: Deliver granular, context-rich developmental tasks that bridge theory and practice.

Process: The Task Generator produces customized micro-learning interventions (e.g., short situational exercises, behavioral role-plays, or real-world mini-experiments). These tasks are directly tailored to the user's active goals and current competency level, designed for rapid integration into daily routines.

Phase 7: Structured Behavioural Reflection Objective: Capture the learner's experience following task completion to inform progress estimation.

Process: After completing a micro-learning task, the learner completes a lightweight reflective prompt consisting of two free-text fields what was observed and what was learned together with a single categorical self-rating of perceived difficulty, selected from three predefined levels (e.g., stepping fully outside one's comfort zone, requiring noticeable effort, or being easy). This

instrument is intentionally lighter-weight than a full Gibbs or Kolb-style experiential learning cycle: it does not separately prompt the learner for emotional response or for forward-looking behavioural adaptation. Extending the reflective prompt to capture these additional dimensions is identified as a direction for future development.

Phase 8: Automated Progress Estimation Objective: Translate the learner's reflective outcome into an updated competency score.

Process: Rather than deriving progress estimation from NLP-based analysis of reflection depth, sentiment, or conceptual understanding, the current implementation applies a deterministic scoring rule. The difficulty category the learner selects in Phase 7 maps to a fixed point increment, which is added to the competency's current score. This increment is bounded by two ceilings: a maximum cumulative task-based bonus above the original baseline, and an absolute score cap that cannot be exceeded through task completion alone. As a result, the highest competency level cannot be reached through accumulated task-based increments alone and instead requires a full reassessment (Phase 9). Incorporating NLP-based qualitative analysis of the free-text reflection fields into progress estimation is identified as a direction for future refinement.

Phase 9: Periodic Reassessment and Profile Updating Objective: Close the loop and update the longitudinal competency baseline.

Process: At scheduled intervals or upon milestone completion, the framework triggers a short reassessment. The results, combined with historical interaction logs, update the permanent learner profile within the Growth Journey Layer, establishing a revised baseline for the next iterative cycle and unlocking further competency-level progression beyond the cap imposed in Phase 8.

5. DISCUSSION

The proposed framework extends existing AI-supported career guidance approaches by shifting the focus from static competency assessment towards continuous competency development.

Instead of treating AI as an information provider or recommendation engine, the framework positions AI as a developmental partner that supports iterative learning through personalized coaching, practical behavioral tasks, and structured reflection. Importantly, the scientific contribution of this work lies not in the implementation of a specific software application, but in proposing a transferable methodological framework that can be implemented using different AI technologies and integrated into diverse educational or organizational contexts.

The integration of Agentic AI into interpersonal competency development introduces critical ethical considerations that must be addressed to ensure safe, trustworthy, and effective learning environments such as algorithmic bias, hallucinations, data privacy and confidentiality.

Generative Large Language Models (LLMs) carry inherent risks of generating biased feedback or incorrect coaching guidance ("hallucinations"). To mitigate this, the AI-Supported Backend operates within constrained prompting boundaries and pedagogical guardrails, ensuring that the Coach Agent non-judgmentally facilitates user reflection rather than issuing authoritative psychological or career diagnoses. The Growth Journey Layer processes highly sensitive user data, including self-assessments, interpersonal conflict scenarios, and personal reflective journals. The current prototype restricts access to this data through row-level security scoped to each authenticated user, with all backend functions validating user identity via JSON Web Tokens before processing a request. Stronger safeguards including encryption at rest, anonymisation of reflective logs, full alignment with data protection regulations such as GDPR, and a user-facing

mechanism to permanently purge historical data on request are identified as necessary extensions for any deployment beyond the current prototype stage.

A core architectural goal of the Career Compass framework is to foster human-AI co-agency without inducing cognitive reliance on automated guidance. The system is designed as a reflective catalyst rather than a decision-maker; key career goals and self-evaluations must always be explicitly chosen and owned by the learner.

6. CONCLUSION AND FUTURE WORK

This paper introduced an AI-supported methodological framework for continuous interpersonal competency development, operationalized through the Career Compass prototype. The framework integrates competency assessment, AI-supported coaching, micro-learning, behavioral reflection, automated progress estimation, and iterative reassessment into a unified developmental cycle designed to support long-term competency growth rather than one-time evaluation.

The Career Compass prototype demonstrates the technical feasibility of implementing the core assessment-coaching-task cycle of this methodology using contemporary large language models, while preserving learner autonomy and reflective practice. Several envisioned components of the broader framework including automated SMARTcriteria validation of learner goals, NLP-based qualitative analysis of reflective content, and a more autonomous, orchestrated multi-agent architecture remain to be implemented and empirically evaluated in future iterations of the prototype.

Although the current prototype provides a functional proof of concept, its educational effectiveness has not yet been empirically validated. Consequently, the next stage of research will involve evaluating the framework with a representative sample of users to investigate its impact on competency development, learner engagement, perceived usefulness, and long-term behavioral change.

Future research may also examine integration with higher education curricula and corporate talent development programmers, compare different AI coaching strategies, and investigate how longitudinal interaction data can further improve personalized competency development. On the technical side, future work will extend the current prototype by incorporating NLP based analysis of reflective content into progress estimation, introducing automated SMART criteria validation at the goal-setting stage, and moving from independently invoked AI components towards a more coordinated, orchestrated multi-agent architecture.

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