BEYOND AI RECOMMENDATIONS: INTEGRATING ARTIFICIAL INTELLIGENCE, CRITICAL THINKING AND HUMAN GUIDANCE IN SECONDARY SCHOOL CAREER DEVELOPMENT

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Abstract

Artificial intelligence (AI) is expanding access to occupational information, educational pathways and personalized exploration in career guidance. However, AI-generated recommendations do not necessarily lead to informed, autonomous or responsible career decisions, particularly among secondary-school students whose interests, identities and decision-making competencies are still developing. This paper proposed the AI–Critical Thinking–Human Guidance (AI–CT–HG) framework, an original conceptual model for integrating AI-supported exploration, critical thinking and human guidance in secondary school career development. The framework comprises five interconnected stages: self-awareness, AI-supported exploration, critical evaluation, reflective human dialogue, and informed decision-making followed by action and review. It was developed through a conceptual synthesis of literature on career construction, planned happenstance, critical thinking, AI in education and human-centred AI governance. The model positions AI as an exploratory resource rather than an authority that determines career choices. Critical thinking serves as the mechanism for evaluating generated information, identifying uncertainty and comparing alternatives, while human guidance provides contextual interpretation, ethical oversight and support for student agency. Transparency, privacy, fairness, accessibility and accountability operate as cross-cutting principles. Practical implications include a structured school-based learning sequence and proposed indicators for assessing the quality of students' career reasoning. Because the framework has not yet been empirically tested, the paper provides a conceptual foundation for pilot studies and evaluation in diverse educational settings.

Keywords: artificial intelligence; career guidance; critical thinking; secondary education; human-centred AI; career development

1. Introduction

Career development is a continuing process through which individuals explore their interests, abilities, values and opportunities, construct educational and occupational aspirations, and revise their decisions as circumstances change. In secondary education the process is particularly important, because students must begin choosing subjects, qualifications and pathways into further education while their self-understanding and knowledge of the labour market are still developing. Career guidance should therefore be understood not simply as the identification of a suitable occupation, but as the development of competencies that enable individuals to make informed, reflective and adaptable decisions.

Generative artificial intelligence (AI) offers new ways to support this process. AI tools can help students explore unfamiliar professions, compare educational pathways, formulate questions, identify relevant competencies and obtain explanations of complex information. Nevertheless, AI-generated content may contain inaccuracies, omit relevant information, reproduce stereotypes or present uncertain suggestions with an appearance of authority. UNESCO's guidance on generative AI in education accordingly stresses human agency, data protection, inclusion and appropriate pedagogical design (Miao & Holmes, 2023).

The problem addressed in this paper is the difference between receiving an AI-generated career recommendation and developing the capacity to make a well-reasoned career decision. A recommendation may appear personalized without reflecting a student's changing interests, social circumstances, educational opportunities or long-term aspirations. If students accept generated suggestions without questioning their assumptions, AI-supported guidance may

narrow exploration instead of expanding it. Conversely, excluding AI from career education altogether may mean forgoing opportunities to make information more accessible and to encourage broader exploration.

The paper argues that responsible AI-supported career guidance requires three complementary functions: AI-assisted exploration, critical evaluation and human guidance. AI can help generate possibilities; critical thinking enables students to examine their reliability and relevance; and teachers or career guidance professionals help students interpret them within their personal and social contexts. To operationalize this argument, the paper proposes the AI–Critical Thinking–Human Guidance (AI–CT–HG) framework, an original conceptual synthesis informed by existing theories and guidance principles and not claimed to be an empirically validated theory. The paper has four objectives:

- to establish a conceptual rationale for integrating AI, critical thinking and human guidance in secondary school career development;
- to develop a structured framework for responsible AI-supported career exploration;
- to translate the framework into practical activities and assessment considerations for schools; and
- to formulate propositions and research directions for future empirical evaluation.

In line with the congress theme, "From Research to Application", the paper contributes to the discussion of AI in education by shifting the emphasis from producing career recommendations to developing students' capacity to question, evaluate and responsibly use them. The argument draws on the career-development and AI-in-education literature and on two practice-oriented resources by the author (Jetishi, 2026a, 2026b), which serve as sources of classroom activities and not as empirical evidence.

2. Conceptual background

2.1 Career development as an active and contextual process

Career construction theory holds that individuals construct career meaning by interpreting experiences, developing personal narratives and responding to changing contexts (Savickas, 2013). Career choices are thus not merely the outcome of matching an individual profile with occupational requirements; they also reflect the meanings people assign to their experiences, aspirations and possible futures. This is particularly relevant for secondary-school students, whose interests are still developing and whose understanding of occupations may be shaped by limited exposure to the world of work. Guidance should therefore enable them to explore alternatives, revise initial assumptions and connect occupational information with their evolving identities.

Planned happenstance theory similarly recognizes that career opportunities may arise from unplanned events and that individuals can learn to recognize and act upon them (Mitchell et al., 1999). It supports an exploratory conception of career education in which curiosity, flexibility and active learning are important outcomes. For AI-supported guidance, the implication is that a system should not attempt to predict one definitive career for each student, but should help students identify possibilities, investigate unfamiliar pathways and make decisions as new information becomes available.

Other major traditions point in the same direction. Super's (1980) life-span, life-space approach treats a career as a sequence of roles unfolding across the lifespan, social cognitive career theory (Lent et al., 1994) explains how self-efficacy, outcome expectations and contextual supports shape interests and choices, and Holland's (1997) typology offers a widely used vocabulary for relating interests to occupational environments. Gottfredson's (1981) theory of circumscription and compromise is especially relevant: it holds that young people

progressively exclude occupations that seem incompatible with their self-concept, including images of gender and social status, often before examining them in detail. If an AI system reproduces such stereotypes, it may reinforce this circumscription instead of widening the range of options considered. The cognitive information processing approach (Sampson et al., 2004) adds that the quality of a career decision depends on how individuals handle information, not only on the information available, which is the premise of the evaluative emphasis adopted here.

2.2 Artificial intelligence in education: opportunities and limitations

AI-supported tools can facilitate access to information, generate explanations and help students compare educational and occupational alternatives. They can also support reflection by helping students formulate questions about their interests, identify skills associated with different occupations or prepare for conversations with guidance professionals. These capabilities, however, do not guarantee that generated information is accurate, comprehensive or appropriate for an individual student. A system may state an incorrect qualification requirement, overlook local educational pathways or reproduce a stereotypical association between personal characteristics and occupations, and the fluency of a response should not be mistaken for evidence of its reliability.

The European Commission's ethical guidelines for educators highlight the need to understand AI- and data-related risks in teaching and learning (European Commission, 2022), and the OECD AI Principles emphasize human-centred values, fairness, transparency and accountability (OECD, 2019). Together with UNESCO's guidance, these sources distinguish between using AI as an educational resource and allowing its outputs to determine educational decisions. The former can support learning; the latter risks transferring responsibility to a system that cannot fully understand a student's circumstances or assume professional accountability. In career guidance, AI should therefore expand and organize exploration, while the evaluation of consequential information and the ownership of career decisions remain with human participants.

Labour-market research supports a task-based reading of AI's effects. Autor (2015) argues that automation substitutes for some tasks while complementing others, and Frey and Osborne (2017) estimated the susceptibility of hundreds of occupations to computerisation. The World Economic Forum (2025) projects substantial churn in employment, with net job growth of 78 million by 2030 alongside a large need for reskilling. Such projections are uncertain and should not be presented to students as predictions about individual careers; they do justify guidance that develops adaptable competencies rather than a single fixed occupational target (Jetishi, 2026a). Reliability concerns are equally documented. Large language models can produce fluent but unsupported content, commonly termed hallucination (Ji et al., 2023), and can reproduce patterns in the data on which they were trained (Bender et al., 2021). Kasneci et al. (2023) discuss both the opportunities and the challenges of such models in education, including concerns about bias and over-reliance.

2.3 Critical thinking as a core career-development competence

Critical thinking is essential to responsible career exploration because students must evaluate not only the information they receive but also the assumptions underlying the options presented to them. Facione's (1990) expert-consensus synthesis identifies interpretation, analysis, evaluation, inference, explanation and self-regulation as core critical-thinking skills, all of which apply directly to career guidance. A student exploring a profession must, for example, distinguish factual claims about qualifications from general descriptions of the occupation,

judge whether the information is current, compare it with reliable sources and recognize when important information is missing.
In AI-supported activities, critical thinking also requires students to examine the output itself: whether uncertain claims are presented as established facts, whether alternative pathways have been omitted and whether stereotypes may be shaping the suggestions. Critical thinking is thus not merely an additional digital skill; it is the central mechanism through which students retain agency when interacting with AI-generated career information.

2.4 Human guidance and student agency

Teachers and career guidance professionals contribute contextual understanding that cannot be reduced to supplying occupational information. They can help students relate information to their educational circumstances, clarify competing priorities, discuss practical constraints and identify further opportunities. Human guidance is not, however, automatically unbiased or infallible: professionals may also rely on incomplete information, outdated assumptions or conventional expectations about occupations. A responsible framework must therefore promote reflection and evidence-based discussion, rather than replace algorithmic authority with unquestioned professional authority. The appropriate role of human guidance is to facilitate informed deliberation in which students ask questions, explain their reasoning, challenge recommendations and develop their own provisional plans.

3. Methodological approach

The paper adopts a conceptual-development approach informed by a focused synthesis of established literature and policy guidance. Its purpose is to develop a theoretically grounded framework for responsible AI-supported career guidance, not to measure the effectiveness of an intervention. The synthesis drew on five areas: career construction and development; planned happenstance and exploratory learning; critical thinking; AI in education; and human-centred AI governance.
The framework was developed in three conceptual steps. First, the literature was examined for principles relevant to career development in AI-supported environments, including student agency, exploration of alternatives, critical evaluation of information, reflective dialogue and responsible technology use. Second, these principles were organized into a sequence of educational activities linking students' self-understanding with the exploration, evaluation and practical use of career information. Third, the sequence was translated into implementation principles, illustrative school activities and indicators for future evaluation. The illustrative activities were drawn from two practice-oriented resources written by the author: an Albanian-language guide for secondary-school students, *Karriera AI* (Jetishi, 2026a), and an English-language guide for career-guidance educators that catalogues 1,000 AI platforms in 96 categories and includes fifteen classroom activities (Jetishi, 2026b). These are practitioner materials, not peer-reviewed studies, and they are not offered as evidence of effectiveness.
The approach has limitations. It is not a systematic review, and no exhaustive database search or formal study-selection procedure is claimed. No human participants were recruited, no student records were analysed and no intervention was conducted; the effectiveness of the framework has therefore not been established empirically.

4. The AI–CT–HG framework for responsible career development

4.1 Rationale and structure

The central proposition of the AI–CT–HG framework is that responsible AI-supported career development depends not only on the quality of generated information, but also on the student's capacity to evaluate that information and on the availability of meaningful human guidance. The framework distinguishes three functional dimensions. *AI-supported exploration* broadens access to occupational and educational information and helps students formulate questions and identify possible pathways. *Critical evaluation* enables students to examine claims, verify information, recognize uncertainty and compare alternatives. *Human guidance* supports contextual interpretation, reflective discussion and responsible decision-making while preserving student agency. These dimensions are organized into five connected stages (Figure 1) that form a flexible learning cycle rather than a rigid sequence: students may return to earlier stages as they gain experience, meet new information or reconsider their priorities.

4.2 The five stages

Stage 1: Self-awareness and clarification. The process begins with the student, not with the AI system. Students reflect on their interests, values, strengths, experiences and aspirations and identify the uncertainties they wish to investigate. The aim is not to generate a fixed psychological profile or to classify students into predetermined occupational categories, but to provide a provisional basis for exploration. Reflective worksheets, discussions of meaningful learning experiences and interest inventories are suitable activities, and the outcome is a preliminary description of the student's interests and questions, together with recognition that these may change.

Stage 2: AI-supported exploration. AI is used to broaden students' awareness of occupations, educational pathways, workplace tasks and relevant competencies. Rather than asking a system to identify the single best career, students are encouraged to explore several possibilities: to request explanations of unfamiliar occupations, compare education routes or obtain suggestions for questions to investigate through authoritative sources. A student interested in communication, technology and social issues, for example, might explore several occupations that combine these interests. AI outputs are treated as provisional suggestions, not as a diagnosis of ability, a prediction of success or a binding recommendation. The outcome is an expanded set of options and questions for further investigation.

Stage 3: Critical appraisal and verification. The third stage is the framework's central evaluative component. Students examine the information generated by AI, decide which claims require verification, compare alternatives, identify missing information and distinguish evidence from assumptions. A structured set of questions can guide this process: Which statements are factual claims, and which are suggestions or interpretations? Can the information be verified through reliable and current sources? Are educational requirements and occupational descriptions accurate for the relevant country or region? Have important alternatives or constraints been omitted? Could stereotypes or unsupported assumptions have influenced the suggestions? Students should also consider whether a recommendation reflects their interests or merely reinforces an initial assumption about themselves. The outcome is not necessarily agreement or disagreement with the AI, but a reasoned assessment that explicitly acknowledges uncertainty where evidence is insufficient.

Stage 4: Reflective human dialogue. A teacher, career guidance professional or other qualified person facilitates a contextual discussion. The student brings the options and verified information from the previous stages, and together they examine the relevance of the

alternatives, the student's priorities and the practical conditions that affect available pathways, such as access to programmes, financial and geographical constraints, family circumstances, accessibility requirements and opportunities for practical experience. The professional's role is not simply to approve or reject an AI recommendation, but to help the student explain their reasoning, recognize trade-offs and consider alternatives. This stage also allows both algorithmic and human assumptions to be challenged: a student should be able to question a recommendation and consider an unconventional pathway when supported by sound reasoning and information.

Stage 5: Informed decision, action and review. The final stage translates reflection into a provisional career-development plan. Students identify next steps, such as researching a programme, speaking with a practitioner, participating in a project, attending an open day or developing a relevant skill. The plan records the options currently considered, the reasons supporting the student's present thinking, the evidence used, the questions that remain and the next actions, together with a point at which the plan will be reviewed. The emphasis on review reflects the continuing nature of career development: the outcome is not a final occupational assignment, but an informed, actionable and revisable plan.

4.3 Cross-cutting principles

Six principles apply throughout the process. *Student agency*: AI outputs are suggestions, not decisions, and students retain the right and responsibility to evaluate alternatives and choose. *Transparency and verification*: students should understand when AI is used, recognize its limitations and verify consequential claims through reliable sources. *Fairness and inclusion*: exploration should challenge stereotypes and avoid assuming equal access to devices, connectivity, digital skills or educational opportunities. *Privacy and data minimization*: students should not enter identifiable or sensitive personal information into AI tools unnecessarily, and schools should follow applicable data-protection requirements. *Human accountability*: educators and institutions remain responsible for the design and oversight of guidance activities, and AI is not an accountable professional decision-maker. *Developmental appropriateness*: activities should suit students' ages, educational needs, digital literacy and capacity to evaluate information.

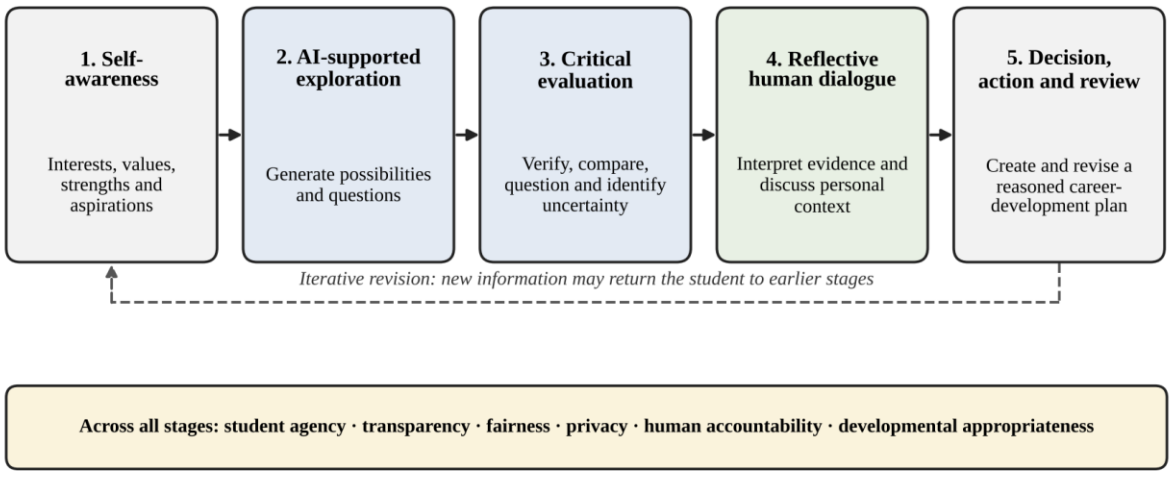


Figure 1. The proposed AI–CT–HG framework for responsible AI-supported career development. Source: author's conceptual synthesis.

5. Practical implementation in secondary schools

The framework is intended for career-education lessons, individual guidance sessions and project-based learning. It does not require a school to develop a new AI system, only a structured educational process in which available tools are used purposefully and their outputs critically examined.

5.1 An illustrative learning sequence

Table 1 translates the framework into activities that can be adapted to the age, curriculum and resources of a school. The sequence is designed to develop students' ability to use information, not merely to produce an occupational recommendation; students should therefore be assessed on the quality of their reasoning and reflection, not on whether they accept a suggestion generated by AI.

Table 1. Practical implementation of the AI–CT–HG framework

Stage	Student activity	Role of AI	Evidence of learning
1. Self-awareness	Reflect on interests, values and experiences.	Optionally generate reflective questions.	The student explains current interests and uncertainties.
2. Exploration	Identify at least three possible occupations or educational pathways.	Generate options and questions for further research.	The student identifies several plausible alternatives.
3. Critical evaluation	Verify claims and compare alternatives.	Supply information that is subsequently scrutinized.	The student distinguishes verified facts, assumptions and unknowns.
4. Human dialogue	Discuss options with a teacher or career guidance professional.	Help prepare questions for discussion.	The student explains contextual factors and trade-offs.
5. Decision and review	Develop a personal action plan.	Help organize steps when appropriate.	The student presents reasons, actions and unresolved questions.

Source: author's proposed application of the AI–CT–HG framework.

5.2 Assessment of career reasoning

The assessment of AI-supported career learning should focus on observable competencies. Possible dimensions are:

- *information verification*: identifying factual claims and checking them against credible sources;
- *comparative reasoning*: examining multiple alternatives using relevant criteria;
- *recognition of uncertainty*: identifying missing evidence, unsupported assumptions and possible bias;
- *reflective self-awareness*: explaining how interests, values and priorities influence the evaluation of alternatives;
- *contextual reasoning*: considering educational requirements, practical constraints and opportunities; and

- *action planning*: translating a reasoned assessment into feasible next steps.

These dimensions are proposed as assessment indicators, not as a validated measurement instrument; their reliability and suitability would need to be examined in subsequent research.

5.3 Responsibilities of educational institutions

Successful implementation requires institutional preparation, not merely access to an AI tool. Schools should establish clear rules for the use of AI in career guidance, provide age-appropriate instruction on its limitations, protect students' personal information and ensure that students without access to particular digital tools can take part through equivalent activities. Teachers and guidance professionals need support in evaluating AI-generated information, recognizing possible bias and facilitating discussions that preserve student autonomy, and AI-generated occupational information should, where possible, be checked against authoritative education, qualification and labour-market sources for the relevant country or region. Because an approach that depends on paid tools or advanced digital skills may widen existing inequalities, institutions should also consider students' different educational needs, language backgrounds and levels of digital access.

5.4 Linking the stages to existing tools and classroom activities

The framework is tool-agnostic, but schools usually need concrete starting points. The educator guide (Jetishi, 2026b) organizes 1,000 platforms into 96 categories, including general-purpose chatbots, education and career guidance, résumé and job-search tools, document analysis and interview preparation, and it proposes classroom activities built around them. Several can be aligned with the five stages (Table 2). Comparing two chatbots on the same niche factual question, checking the answers of a document-chat tool line by line against the source text, and auditing images generated from deliberately generic prompts such as "a nurse" all exercise the verification and bias-recognition skills of Stage 3, whereas rebuilding a résumé with an applicant-tracking-system tool and practising interview questions support the action-oriented Stage 5. The student-oriented book *Karriera AI* (Jetishi, 2026a) contributes end-of-chapter reflection questions, a skills self-assessment, a monthly learning plan and a personal plan for 2027–2050, which correspond to Stages 1, 4 and 5.

Table 2. Illustrative alignment of the stages with activities and tool categories

Stage	Example activity	Tool category	Resource
1. Self-awareness	Skills self-assessment (1–5); letter to a future self.	No tool required.	Jetishi (2026a), Ch. 6; Jetishi (2026b), Activity 15
2. Exploration	Career-cluster "speed-dating": explore one tool and one related career per station.	Specialized categories across the catalogue.	Jetishi (2026b), Activity 13
3. Critical evaluation	Confidence Test with two chatbots; Verification Habit; Bias Audit.	General-purpose chatbots; document analysis; image generation.	Jetishi (2026b), Activities 1, 11, 8
4. Human dialogue	Teacher-led discussion based on end-of-chapter reflection questions.	No tool required.	Jetishi (2026a), Chs. 1–12

Stage	Example activity	Tool category	Resource
5. Decision and review	Résumé Rebuild; Mock Interview; written personal plan.	Résumé and job search; interview preparation.	Jetishi (2026b), Activities 2, 5; Jetishi (2026a), Ch. 11

Source: author's alignment, based on Jetishi (2026a, 2026b). Not empirically tested.

5.5 Data protection and regulatory context

Because career guidance involves minors' personal information, institutions should consider the applicable legal framework. In Kosovo, the processing of personal data is governed by Law No. 06/L-082 on the Protection of Personal Data (Assembly of Kosovo, 2019). The EU Artificial Intelligence Act (European Union, 2024) is not directly applicable in Kosovo, but its approach is a useful regional reference: it classifies certain AI systems used in education and vocational training, such as those used to determine access or admission or to evaluate learning outcomes, as high-risk. Career guidance in which AI steers or filters students' options may come close to this territory, which reinforces the framework's insistence on human accountability. The practical advice in the educator guide is consistent with this position: check the age policy and privacy terms of each tool, never upload sensitive personal data to public tools, and ask who maintains a tool and what happens to the data entered (Jetishi, 2026b).

6. Discussion

6.1 From automated recommendations to informed agency

The central contribution of the AI–CT–HG framework is its integration of AI-supported exploration, critical thinking and human guidance into a single career-development process. AI is treated as a resource for expanding possibilities, not as an authority responsible for selecting a student's future occupation. This differs from approaches that evaluate AI-supported guidance chiefly by the convenience or personalization of its recommendations. Personalization may be useful, but it does not by itself demonstrate accuracy, fairness or educational value; the framework therefore treats the quality of students' reasoning as a central objective.

Critical evaluation matters particularly because AI-generated recommendations may influence students before they have explored the full range of their interests and opportunities. A student who expresses interest in one profession may receive recommendations closely associated with it and, if these are accepted uncritically, may explore fewer alternatives and mistake an early preference for a fixed career identity. The framework addresses this risk by encouraging students to examine multiple pathways, verify claims and consider information that challenges their initial assumptions. This does not mean that every recommendation should be rejected or that AI-generated information is inherently unreliable; it means that acceptance should follow an evaluative process rather than rest on the authority or fluency of the system.

6.2 Human guidance as contextual deliberation

Career decisions involve considerations beyond occupational information. Students may need to weigh educational aspirations against practical circumstances, consider different routes into a profession or discuss questions that cannot be resolved through information retrieval alone. Human involvement must, however, be meaningful: brief professional approval of an AI-

generated recommendation would not necessarily protect student agency. The model therefore treats human guidance as a deliberative process in which the professional encourages independent reasoning and remains open to alternatives, rather than as a final authorization stage.

6.3 Original contribution

The originality claimed lies in the proposed integration and educational sequencing of three complementary functions (exploration, evaluation and contextual guidance) across five stages from self-awareness to action and review, supported by cross-cutting principles. The framework draws on existing career-development theories and established principles of critical thinking and responsible AI, and it does not claim that these underlying ideas are new. To the author's knowledge, it is a proposed conceptual contribution rather than an established model; a systematic review of existing frameworks would be needed before claiming that no substantially similar model exists. In relation to the literature, general guidance on AI in education addresses principles and policy at a broad level (Miao et al., 2021; Miao & Holmes, 2023; Kasneci et al., 2023), while career theories explain decision processes without specifying how AI should enter them (Savickas, 2013; Super, 1980). The AI–CT–HG framework is positioned between the two, as an attempt to translate both into a sequence that a school can enact.

6.4 Limitations

Several limitations should be acknowledged. First, the framework has not been tested empirically with students, teachers or guidance professionals, so its educational effectiveness remains unknown. Second, the conceptual synthesis was not a systematic review, and relevant studies or frameworks may have been omitted. The practice-oriented resources used to illustrate activities are practitioner materials that have not been evaluated empirically, and any catalogue of AI tools is time-bound because products change rapidly (Jetishi, 2026b). Third, implementation will depend on national curricula, the availability of reliable occupational information, school resources and the characteristics of the AI tools used. Fourth, the framework assumes that meaningful human guidance is available; where trained professionals are scarce, alternatives such as trained teachers, structured peer activities or remote guidance may be required. Finally, because AI systems and their governance continue to evolve, the framework should be treated as a model requiring ongoing review and adaptation.

7. Propositions and directions for future research

The framework generates propositions that can be examined empirically. They are hypotheses for investigation, not findings of the present paper.

Proposition 1. Students who receive explicit instruction in critically evaluating AI-generated career information will show stronger information-verification and reasoning skills than students who use AI without such instruction.

Proposition 2. Structured human-guidance dialogue will help students connect occupational information with personal priorities and contextual factors more effectively than exposure to AI recommendations alone.

Proposition 3. Activities that require the exploration and comparison of multiple pathways will encourage broader consideration of alternatives than activities centred on a single AI-generated recommendation.

Proposition 4. The educational value of AI-supported career guidance will depend not only on the tool itself but also on student agency, educator preparation, access to reliable information and institutional safeguards.

A feasible next step is a pilot study with secondary-school students that compares performance before and after an AI–CT–HG learning sequence, using a defined rubric for source verification, comparative reasoning, recognition of uncertainty and action planning. Interviews with students and guidance professionals could complement these assessments by examining perceived usefulness, confidence in evaluating generated information and the sense of ownership over career decisions. Such research would require institutional approval, informed consent and age-appropriate data protection. If results were promising, later studies could examine applicability across schools, languages and educational systems, and compare the model with existing guidance practices that do not incorporate AI.

8. Conclusions

AI offers new possibilities for expanding access to career information and supporting the exploration of educational and occupational pathways, but the availability of AI-generated recommendations does not automatically produce informed career decisions. Students need the competencies to evaluate information, recognize uncertainty, compare alternatives and connect possible pathways with their interests, values and circumstances.

This paper proposed the AI–CT–HG framework as an original conceptual integration of AI-supported exploration, critical thinking and human guidance in secondary school career development. Its five stages (self-awareness, AI-supported exploration, critical evaluation, reflective human dialogue, and informed decision-making followed by action and review) offer a structured way of translating responsible-AI principles into educational practice. The framework's central proposition is that AI should expand students' opportunities to explore rather than determine their futures: critical thinking enables students to evaluate recommendations, and human guidance supports contextual understanding and reflective decision-making.

The framework has not yet been empirically validated. Its value should be assessed through pilot implementation, the development of appropriate assessment instruments and research across diverse educational settings, including the effects of institutional conditions, educator preparation and access to reliable information. Ultimately, the challenge for career education is not to give students more recommendations, but to help them become more capable of evaluating possibilities and making informed decisions. The AI–CT–HG framework offers a conceptual foundation for pursuing this aim and for examining how technology can support, rather than replace, the human processes involved in career development.

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