

# Career Uncertainty and Openness to Non-Obvious Careers: The Role of Artificial Intelligence

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## Abstract

**Background:** Young adults are making career decisions in a labour market shaped by technological change, economic instability and the growing use of artificial intelligence. AI is often discussed as a source of disruption and anxiety, yet it may also support exploration by helping users identify emerging, hybrid and less visible career pathways. This study examined career uncertainty, openness to non-obvious careers and receptivity to AI-supported career exploration among young adults.

**Methods:** An exploratory cross-sectional survey design was used. The sample consisted of 80 respondents aged 18-24 years. The questionnaire examined career certainty, fear of making the wrong career decision, perceived labour-market awareness, knowledge of less prominent career options, openness to skills-based career discovery and interest in digital, interactive, gamified and AI-supported career exploration tools. Data were analysed descriptively through frequencies, percentages and exploratory cross-tabulations; open-ended responses were reviewed thematically.

**Results:** More than half of the participants reported uncertainty about their professional future (53.75%) and fear of making the wrong career decision (56.25%). Nearly half (46.25%) felt inadequately informed about current career options, and only 28.75% reported familiarity with less prominent career paths. At the same time, interest in guided discovery was high: 86.25% wanted to discover career options they would not have considered independently, and 90.00% wanted to learn about professions connected to their existing skills. Receptivity to interactive formats was also strong, with 76.25% willing to use a scenario-based digital tool and 83.75% preferring an interactive experience over a classic test. Interest in AI-supported personalised insight was positive but more cautious (56.25%).

**Conclusions:** In this exploratory sample, career uncertainty coexisted with a strong interest in discovering non-obvious and skills-related professional pathways. AI-supported tools may contribute to this process when they are transparent, interactive and designed to support reflection rather than to automate career choice. The findings support cautious development of AI-assisted career exploration as a decision-support resource, not as a substitute for human career guidance.

## Keywords

career uncertainty; artificial intelligence; career guidance; non-obvious careers; young adults; career adaptability; digital career tools

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## Introduction

For many young adults, career choice now takes place against a background that feels less predictable than in the past. Technological change, economic pressure and the visible spread of artificial intelligence have made the question of “what should I do next?” harder to answer with confidence. The issue is not only that there are more occupations to choose from. It is also that the meaning of many occupations is changing, while new combinations of skills and roles are becoming relevant before they appear in ordinary career information systems.

Career uncertainty, therefore, should not be treated simply as a lack of information. It is also connected with perceived control, self-efficacy and the ability to manage one’s own career development. Longitudinal evidence suggests that occupational self-efficacy and self-management behaviours are relevant to how individuals respond when their career conditions feel insecure (1). This is particularly important for people aged 18-24, who are often asked to make educational and professional choices before they have accumulated stable labour-market experience or a clear vocational identity.

The psychological side of this process is equally important. Career decisions involve more than a rational comparison of available options. They may include anticipated regret, fear of mismatch, family expectations, identity concerns and the hope that one’s work will feel meaningful. A dual-process view of career decision-making highlights the interaction between analytic and affective processes (2). Research with university students has also shown that uncertainty may be intensified by the contemporary expectation that a career should express authenticity and self-realisation while still remaining economically viable (3).

Artificial intelligence enters this picture in an ambivalent way. It can heighten worry about automation, skill obsolescence and future employability. At the same time, it can help organise complex information and show connections between skills and pathways that a young person might not find alone. Recent career research has begun to treat AI not only as a technological tool, but as a force that shapes career stages, competencies and transitions (4). For career guidance, this means that the task is no longer only to describe existing jobs. Guidance also needs to help users interpret how their skills might transfer into emerging, hybrid or less visible roles.

In this article, the term non-obvious careers is used for professional paths that are not immediately visible through conventional occupational categories. These may include emerging roles, interdisciplinary occupations, hybrid pathways or under-promoted professions that become relevant when viewed through a person’s skills, interests and developmental potential. The term does not suggest that such careers are fictional or purely speculative. It refers to options that may exist, but may not be easily recognised by young adults who rely mainly on familiar job titles.

The present study examines career uncertainty, openness to non-obvious careers and receptivity to AI-supported career exploration among young adults aged 18-24. The survey was exploratory. It was designed to capture how participants per-

ceived their own career clarity, how informed they felt about the labour market, and whether they would be interested in interactive, skills-based or AI-supported forms of career exploration.

The article does not present AI-supported guidance as a clinical intervention, nor as a replacement for career counselling. It approaches AI more cautiously: as a possible non-clinical, psychosocial and vocational support mechanism that may help users structure uncertainty, broaden their awareness and reflect on the relationship between their skills and possible futures.

This cautious framing is necessary because AI-supported career tools also raise ethical questions. Bias, opacity, privacy risks and automation bias may all affect how a user interprets an output. For that reason, the argument developed here is not that AI should decide a career path. It is that AI may be useful when it expands exploration while preserving user agency, critical reflection and access to human guidance where needed.

## Theoretical Background

Career uncertainty among young adults should be understood as both a vocational and psychological issue. It is vocational because it concerns the ability to identify, evaluate and commit to possible educational or professional pathways. At the same time, it is psychological because uncertainty about the future may involve anxiety, fear of regret and reduced confidence in one’s ability to make an appropriate decision. Previous research has shown that career insecurity is linked to self-management and occupational self-efficacy, suggesting that individuals who feel more capable of managing their own career development may be better able to cope with unstable career conditions (1).

This is particularly relevant in early adulthood, when many individuals are required to make educational and occupational choices before they have acquired stable experience of the labour market. Career decision-making at this stage is not simply a rational matching process between personal interests and available occupations. It may also involve emotional responses, anticipated regret and difficulty integrating personal identity with realistic employment prospects. A dual-process perspective suggests that career decisions are shaped by both analytic and affective processes, which can become more difficult to manage when the future is perceived as unstable or unclear (2).

The cultural meaning attached to career choice may further intensify uncertainty. In contemporary educational and professional contexts, young adults are often encouraged to choose careers that express authenticity, self-realisation and personal growth. However, these expectations coexist with financial pressure, labour market competition and unclear future opportunities. Research on university students has shown that career uncertainty may therefore be connected not only to lack of information, but also to the pressure of making a choice that feels personally meaningful and socially viable at the same time (3).

Artificial intelligence adds a further layer to this uncertainty. AI is increasingly associated with the transformation of occupations, the automation of tasks and the emergence of new forms of work. Recent research has examined AI not only as a technological development, but also as a factor that reshapes career stages, career competencies and professional transitions (4). For young adults, this means that career planning takes place in an environment where some existing roles may change, while new or hybrid roles may appear before they become widely recognised in traditional career guidance systems.

The psychological impact of AI on career development is becoming increasingly visible. AI anxiety has recently been examined as a form of career-related concern among college students, particularly where artificial intelligence is perceived as a threat to future employability and professional relevance (5). This matters for the present study because AI-related uncertainty may affect not only labour market expectations, but also the emotional process through which young adults evaluate their future options. In this sense, AI may intensify career uncertainty when it is framed primarily as a threat.

However, the relationship between AI and career development is not exclusively negative. Acceptance of artificial intelligence has been linked to perceived employability through positive attitudes toward AI and career adaptability (6). This suggests that young adults who develop a more constructive understanding of AI may be better positioned to interpret technological change as a field of possible adaptation rather than only as a source of risk. Similarly, research on AI technostress indicates that AI-related technological demands may have different effects depending on whether they are experienced as hindrance stressors or challenge stressors (7). This distinction is important because the same technological change may either increase anxiety or stimulate proactive learning, depending on how it is understood and supported.

Within career guidance, AI-supported tools may offer new possibilities for exploration. Computer-assisted career guidance systems have been examined as tools that can support students' career path planning by using different enabling technologies and forms of personalised decision support (8). These tools may be especially useful when users need help connecting interests, skills and possible career pathways. Nevertheless, their role should be understood carefully. AI-supported career guidance should not be treated as an automated authority that determines the correct profession for the user. Rather, it should function as a structured decision-support mechanism that helps users explore, compare and reflect.

Gamified and interactive forms of career guidance may also support engagement, particularly among younger users. Prior work on gamified career guidance has suggested that interactive digital environments may increase intrinsic motivation and make career exploration more engaging (9). Similarly, gamification has been examined as a way to support decision-making processes in adolescent career choice, especially when it is used to structure exploration rather than to replace reflection (10). These findings are relevant to the present study because young adults may be more willing to

explore unfamiliar pathways when career guidance is delivered through experiential and interactive formats.

This is particularly relevant to the concept of non-obvious careers. In this article, non-obvious careers refer to professional paths that are not immediately visible through conventional occupational categories. They may include emerging roles, hybrid occupations, interdisciplinary pathways or less promoted professions that become relevant when viewed through a person's skills, interests and behavioural tendencies. The present study's findings support the relevance of this concept: only 28.75% of participants reported familiarity with less prominent career options, while 86.25% expressed interest in discovering career options they would not have considered independently and 90.00% wanted to learn about professions connected to their existing skills.

The need for non-obvious career exploration is therefore not simply a matter of presenting unusual job titles. The findings suggest that young adults are interested in unfamiliar career paths when these are made personally meaningful through skills-based explanation. In other words, the key issue is not novelty alone, but relevance. A career path becomes useful to the user when the connection between the role, the person's skills and the realities of the labour market is clearly explained.

At the same time, AI-supported systems raise ethical concerns that are especially important in career guidance. Recommendations may be affected by incomplete data, biased assumptions or lack of transparency. In career-related decision support, this is particularly important because algorithmic systems can influence how users understand their future possibilities. Research on digital career guidance has highlighted the need to critically examine the role of digital tools in shaping transitions and guidance practices (11). More broadly, explainability has been identified as a key factor in building trust in AI systems (12).

Algorithmic bias is another relevant concern. In employment-related contexts, AI systems may reproduce or intensify existing inequalities if they rely on biased data or poorly evaluated decision rules. A review of AI techniques for addressing algorithmic bias in job hiring highlights that fairness and transparency are essential when AI systems are used in career-relevant settings (13). Although the present article focuses on career exploration rather than hiring, similar ethical concerns apply. Young users may over-trust automated outputs, particularly when they already feel uncertain. For this reason, AI-supported career tools should be designed to preserve autonomy, explain their reasoning and encourage reflection rather than passive acceptance.

Finally, AI-driven career guidance should also be considered in relation to the changing skills landscape. Research on AI, upskilling and reskilling has emphasized that workers increasingly need both technical and transferable skills in order to adapt to AI-related transformations in organisations (14). This strengthens the relevance of skills-based career exploration. Instead of guiding young adults only toward fixed occupational titles, career guidance may need to help them identify skill combinations that can remain transferable across multiple future pathways.

### Study Design

This study used an exploratory cross-sectional survey design to examine career uncertainty, openness to non-obvious careers and receptivity to AI-supported career exploration among young adults. The purpose was descriptive rather than causal. The analysis therefore focuses on response patterns, perceived information gaps and preferences for future-oriented forms of career support.

An exploratory design was appropriate because the topic sits at the intersection of career guidance, artificial intelligence and youth uncertainty, where empirical literature is still developing. The study was not intended to validate a tool. Instead, it asked whether young adults who report uncertainty also show interest in discovering less visible, skills-related or non-obvious pathways through digital and AI-supported formats.

The survey was conducted as part of exploratory needs assessment informing the development of FlameVerse AI, a career exploration platform concept focused on AI-supported, interactive and skills-based career discovery. Participants did not use the platform as part of this study. The survey therefore did not evaluate the effectiveness of FlameVerse AI, and no clinical, diagnostic or therapeutic intervention was provided.

### Participants

The sample consisted of 80 respondents aged 18-24 years. The largest age groups were 18-year-old participants, who represented 31.25% of the sample, and 24-year-old participants, who represented 23.75%. The remaining respondents were distributed across the ages of 19, 20, 21, 22 and 23.

Regarding current life stage, most participants were connected to education. University students represented 42.50% of the sample, while high school students represented 11.25%. An additional 21.25% of participants reported that they were both working and studying. Taken together, 75.00% of the sample was engaged in an educational context, either exclusively or alongside work. The remaining participants were employed, recent graduates or individuals seeking career direction/other.

Because the sample was relatively small and based on available respondents, the findings should be interpreted as exploratory and not as representative of the wider population of young adults.

### Survey Instrument

The survey included closed-ended items using a five-point agreement scale, ranging from strong disagreement to strong agreement. The items examined four main domains.

The first domain concerned career certainty and career-related anxiety. Participants were asked whether they had decided on their career direction, whether they found it difficult to understand which path suited them, whether they felt uncertain about their professional future and whether they feared making the wrong career decision.

The second domain examined labour market awareness and occupational knowledge. Participants were asked whether

they believed they had a good picture of today's labour market, whether they knew several career options currently available and whether they were familiar with less prominent or less mainstream professional options.

The third domain focused on openness to non-obvious and skills-based career discovery. Participants were asked whether they would be interested in discovering professional options they would not have thought of independently, whether they would like to learn about professions connected to their existing skills and whether they considered it useful to discover lesser-known professional roles that might suit them.

The fourth domain examined receptivity to digital, interactive, gamified and AI-supported career exploration tools. Participants were asked whether they would use a digital tool based on interactive choices and scenarios, whether they would prefer an interactive experience over a classic test, whether gameplay elements would make such a tool more attractive and whether they would be interested in using AI for more personalized career insight.

The questionnaire also included open-ended questions asking participants what they would like such a tool to include, what would make a career exploration experience useful and interesting, and how they would prefer new or less-known professional pathways to be presented. These responses were used to identify qualitative preferences regarding content, format and user experience.

### Procedure

Participants completed the survey voluntarily. The questionnaire first collected demographic and life-stage information and then moved to items concerning career certainty, labour market awareness, openness to non-obvious careers and receptivity to digital or AI-supported career exploration tools.

The order of the questions was designed to move from general career concerns toward more specific questions about possible forms of support. This allowed participants to first reflect on their own career situation before evaluating interactive, gamified or AI-supported tools.

### Ethical Considerations

Participation was voluntary and anonymous. Participants were informed about the general purpose of the survey before completing it, and completion of the questionnaire was considered consent to participate. No identifying personal data, clinical information or sensitive health data were collected.

The study was non-clinical and did not involve intervention, diagnosis or treatment. It focused on self-reported perceptions of career uncertainty, career information and interest in career exploration tools. The study was conducted according to the general ethical principles of voluntary participation, anonymity, informed participation and responsible handling of survey data.

The survey involved adults aged 18-24 and was anonymous, minimal-risk and non-clinical. No identifiable personal data, health data or intervention procedures were collected. According to the authors' assessment, the study fell within

minimal-risk anonymous survey research; however, no formal institutional ethics review was obtained.

Data Analysis

Data were analysed descriptively. Frequencies and percentages were calculated for all closed-ended items in order to identify the distribution of responses across the main study variables.

For interpretive clarity, agreement responses were grouped where appropriate. Agree and Strongly agree were combined to indicate total agreement, while Disagree and Strongly disagree were combined to indicate total disagreement. Neutral responses were reported separately.

Exploratory cross-tabulations were also reviewed to examine possible differences across demographic and contextual variables, including gender, age and current life stage. These comparisons were treated cautiously due to the small sample size and the descriptive nature of the study.

Open-ended responses were reviewed thematically. Recurring themes were identified in relation to participants' preferences for future career exploration tools, including the need for practical labour market information, day-in-the-life insights, personalization, interactivity, visual formats, tags and skill-tree structures.

Results

Participant Characteristics

The survey included 80 respondents aged between 18 and 24 years. The largest age group was 18-year-olds, representing 31.25% of the sample, followed by 24-year-olds, who represented 23.75%. The remaining participants were distributed across the ages of 19, 20, 21, 22 and 23.

Most respondents were connected to education. University students represented 42.50% of the sample, high school students represented 11.25%, and participants who were both working and studying represented 21.25%. Overall, 75.00% of the sample was engaged in an educational context, either exclusively or alongside employment.

Table 1. Demographic and educational/occupational characteristics of the sample

| Variables          | Category                         | n  | %     |
|--------------------|----------------------------------|----|-------|
| Age                | 18                               | 25 | 31.25 |
| Age                | 19                               | 7  | 8.75  |
| Age                | 20                               | 9  | 11.25 |
| Age                | 21                               | 7  | 8.75  |
| Age                | 22                               | 7  | 8.75  |
| Age                | 23                               | 6  | 7.50  |
| Age                | 24                               | 19 | 23.75 |
| Current life stage | High school student              | 9  | 11.25 |
| Current life stage | University student               | 34 | 42.50 |
| Current life stage | Working and studying             | 17 | 21.25 |
| Current life stage | Employed                         | 9  | 11.25 |
| Current life stage | Recent graduate                  | 7  | 8.75  |
| Current life stage | Seeking career direction / Other | 4  | 5.00  |

Career Uncertainty and Decisional Anxiety

Career uncertainty appeared as a prominent issue within the sample. Nearly 59.00% of respondents reported that they had decided on their career direction only to some extent, suggesting that for many participants, career choice remained an ongoing process of exploration rather than a settled decision. In addition, 38.75% reported difficulty understanding which career path suited them, while 41.25% stated that they did not have a clear picture of the professional path they would like to follow.

The emotional dimension of career uncertainty was particularly visible. More than half of the respondents, 53.75%, expressed uncertainty regarding their professional future. Similarly, 56.25% reported fear of making the wrong career decision. The intensity of these concerns was also notable: 23.75% strongly agreed that they felt uncertain about their professional future, while 20.00% strongly agreed that they feared making the wrong career decision. These findings suggest that, for a considerable subgroup of participants, career uncertainty was not only a cognitive difficulty related to lack of clarity, but also an emotionally charged concern about future consequences.

**Table 2. Career uncertainty and career-related anxiety**

| Survey item                                        | Strongly agree n (%) | Agree n (%) | Total agreement n (%) | Neutral n (%) | Total disagreement n (%) |
|----------------------------------------------------|----------------------|-------------|-----------------------|---------------|--------------------------|
| Difficulty understanding suitable career direction | 4 (5.00)             | 27 (33.75)  | 31 (38.75)            | 20 (25.00)    | 29 (36.25)               |
| Uncertainty about professional future              | 19 (23.75)           | 24 (30.00)  | 43 (53.75)            | 26 (32.50)    | 11 (13.75)               |
| Fear of making the wrong career decision           | 16 (20.00)           | 29 (36.25)  | 45 (56.25)            | 19 (23.75)    | 16 (20.00)               |
| Lack of clear picture of desired professional path | 8 (10.00)            | 25 (31.25)  | 33 (41.25)            | 17 (21.25)    | 30 (37.50)               |

## Labour Market Awareness and Knowledge of Less Prominent Careers

Participants' responses indicated a mixed level of perceived labour market awareness. A total of 40.00% of respondents agreed or strongly agreed that they had a good picture of the current labour market. However, 30.00% disagreed or strongly disagreed, while another 30.00% remained neutral. This distribution suggests that, although a segment of the sample felt relatively informed, the majority either lacked confidence in their understanding of the labour market or did not express a clear position.

A similar pattern appeared in relation to general occupational awareness. More than half of the participants, 55.00%, reported that they knew several career options that exist today. However, this general awareness did not extend equally to less visible or less mainstream professional paths. Only 28.75% agreed or strongly agreed that they knew less prominent career options, while 30.00% disagreed or strongly disagreed and 41.25% remained neutral.

The perceived information gap was further reflected in responses concerning the adequacy of career-related information. Nearly half of the sample, 46.25%, reported that they did not feel adequately informed about the professional options available today. In contrast, only 26.25% felt that their current information was adequate, while 27.50% remained neutral.

These findings suggest that young adults may have some awareness of common or visible career options, while having more limited exposure to less obvious, emerging or niche career pathways. This distinction is important because it indicates that career uncertainty may not only reflect indecision, but also the limited visibility of professional options beyond mainstream occupational categories.

## Openness to Non-Obvious and Skills-Based Career Discovery

Despite the reported information gaps, participants showed strong openness to discovering unfamiliar career options. A total of 86.25% agreed or strongly agreed that they would be interested in discovering professional options they would not have thought of independently. Only 3.75% disagreed or strongly disagreed, while 10.00% remained neutral.

Interest was even stronger when unfamiliar career paths were connected to participants' existing skills. Specifically, 90.00% of respondents agreed or strongly agreed that they would like to learn about professions related to their skills, even if they did not already know these professions. Almost half of the sample, 47.50%, strongly agreed with this statement.

The perceived usefulness of discovering lesser-known roles was also high. A total of 87.50% of participants agreed or strongly agreed that it would be useful to discover professional roles that are not particularly well known but might suit them. Similarly, 82.50% expressed interest in a tool that would show them career paths beyond the obvious options.

Taken together, these findings indicate a clear contrast between participants' current level of information and their interest in future-oriented career discovery. While many respondents did not feel adequately informed about existing options, most were open to exploring unfamiliar paths, particularly when these paths were linked to their own skills.

## Receptivity to Interactive, Gamified and AI-Supported Career Tools

Participants expressed strong receptivity to digital and interactive forms of career exploration. A total of 76.25% reported that they would use a digital tool that helps them explore careers through interactive options and scenarios. Only 7.50% disagreed or strongly disagreed, while 16.25% remained neutral.

Preference for experiential formats was even stronger. A total of 83.75% of respondents agreed or strongly agreed that they would prefer a career exploration tool that feels more like an interactive experience than a classic test. This finding suggests that participants may be more engaged by tools that allow exploration, simulation and reflection, rather than by static assessment formats alone.

Gameplay elements were also positively received, although endorsement was lower than for interactivity in general. A total of 61.25% of participants agreed or strongly agreed that gameplay elements would make a career exploration tool more attractive. At the same time, 28.75% remained neutral, suggesting that gamification may enhance engagement for many users, but should not be treated as universally necessary or sufficient.

Interest in AI-supported personalization was positive but more cautious. A total of 56.25% of respondents expressed interest in using a career exploration tool that uses AI to offer more personalized insight. However, 27.50% remained neutral and 16.25% disagreed or strongly disagreed. This pattern suggests that AI may be perceived as useful when it supports personalization, but some users may still require reassurance regarding transparency, privacy, accuracy and the limits of algorithmic recommendations.

**Table 3. Openness to non-obvious careers and receptivity to digital/AI-supported tools**

| Survey item                                                              | Total agreement n (%) | Neutral n (%) | Total disagreement n (%) |
|--------------------------------------------------------------------------|-----------------------|---------------|--------------------------|
| Interest in discovering career options not considered independently      | 69 (86.25)            | 8 (10.00)     | 3 (3.75)                 |
| Interest in professions connected to existing skills                     | 72 (90.00)            | 6 (7.50)      | 2 (2.50)                 |
| Usefulness of discovering lesser-known roles that may fit the individual | 70 (87.50)            | 7 (8.75)      | 3 (3.75)                 |
| Interest in a tool showing career paths beyond obvious choices           | 66 (82.50)            | 11 (13.75)    | 3 (3.75)                 |
| Willingness to use a digital tool with interactive choices and scenarios | 61 (76.25)            | 13 (16.25)    | 6 (7.50)                 |
| Preference for interactive experience over classic test                  | 67 (83.75)            | 11 (13.75)    | 2 (2.50)                 |
| Gameplay elements would make the tool more attractive                    | 49 (61.25)            | 23 (28.75)    | 8 (10.00)                |
| Interest in AI-supported personalized career insight                     | 45 (56.25)            | 22 (27.50)    | 13 (16.25)               |

## Qualitative Preferences for Future Career Exploration Tools

The open-ended responses provided additional insight into participants' expectations for future career exploration tools. Four main themes were identified.

First, participants emphasized the need for practical labour market information. They wanted career tools to include concrete details about employment prospects, required qualifications, salaries, competitiveness and possible workplaces. This suggests that career exploration should not focus only on personal interests or abstract occupational descriptions, but should also include realistic information about the conditions attached to each professional path.

Second, participants expressed interest in day-in-the-life insights and real professional experiences. Responses referred to roleplay, simulations and presentations showing what everyday work in a given profession actually involves. This finding supports the relevance of experiential learning, especially when presenting less familiar or non-obvious career options.

Third, respondents asked for personalization beyond generic recommendations. They referred to interests, abilities, character, hobbies and emotional factors as elements that should be considered when presenting possible career paths. This indicates that participants valued guidance that feels individually relevant rather than standardized or impersonal.

Fourth, participants preferred simple, visual and low-friction presentation formats. They mentioned short videos, images, bullet points, tags and skill-tree structures as possible ways of presenting new or lesser-known careers. These responses suggest that unfamiliar career paths should be communicated in a clear, visually accessible and personally relevant way.

Overall, the qualitative findings supported the quantitative results. Participants did not appear to seek only a list of occupations. Rather, they expressed interest in tools that combine practical labour market data, personalized interpretation, interactive experience and accessible presentation.

## Discussion

This exploratory study shows a pattern that is worth taking seriously. Many participants were unsure about their professional future and feared making the wrong career decision. At the same time, they were not closed to exploration. On the contrary, most wanted to discover options they had not previously considered, especially when these options could be connected to their existing skills. Career uncertainty in this sample therefore did not look like disengagement. It looked more like a need for clearer, more relevant and more usable forms of guidance.

The emotional weight of career choice was one of the clearest findings. More than half of the participants reported uncertainty about their professional future, and a similar proportion feared making the wrong decision. This matters because career guidance is sometimes treated mainly as an information problem: if young adults receive enough data about studies, jobs and salaries, the uncertainty will suppos-

edly decrease. The present findings suggest that this may be only partly true. Information is necessary, but it does not automatically reduce the fear of choosing badly or the pressure to connect a career path with a sense of identity.

For this reason, guidance that focuses only on lists of occupations may leave an important part of the problem untouched. Young adults may also need structured exploration that helps them connect abilities, interests, worries and realistic labour-market possibilities. In practical terms, this means that career support should aim not only at informational clarity, but also at reflective confidence: the user should understand possible pathways and feel able to question, compare and revise them.

The results also show a gap between general occupational awareness and knowledge of less visible career options. Although more than half of the participants reported knowing several career options, fewer than one third were familiar with less prominent professional pathways. This distinction is important. A young person may know many common occupations and still have a narrow view of what is possible, especially when emerging, hybrid or interdisciplinary roles are not presented in ordinary guidance material.

The high interest in non-obvious careers should therefore not be interpreted as simple curiosity about unusual job titles. Participants were especially interested when unfamiliar roles were linked to their own skills. This suggests that relevance matters more than novelty. A less visible career path becomes meaningful when the user can understand why it fits, what skills it requires and how it connects to real labour-market conditions.

These findings support the value of skills-to-career mapping. Instead of asking young adults to choose one fixed profession from a predetermined list, career exploration tools can help them see how the same skill set may open several directions. This may be particularly useful in a labour market where professional identity is increasingly shaped by transitions, combinations of skills and continuous learning, rather than by one early and permanent occupational choice.

The preference for interactive and experiential formats was also strong. Most participants said they would use a tool based on interactive choices and scenarios, and even more preferred an interactive experience over a classic test. This does not make traditional assessments obsolete. It does suggest, however, that assessment may become more engaging when combined with simulation, narrative, reflective feedback or day-in-the-life representations. Such formats may be especially helpful for non-obvious careers, because unfamiliar roles are difficult to evaluate through titles alone.

Gamification should be handled more carefully. A majority of participants found gameplay elements attractive, but the level of endorsement was lower than for interactivity in general. This indicates that game elements may support motivation, but they should not become the centre of the intervention. In career guidance, gamification is useful only when it helps users reflect, compare and explore. If it replaces meaningful feedback with superficial rewards, it risks weakening the seriousness of the process.

Interest in AI-supported personalisation was positive, but it was also more cautious than interest in interactivity. This is an important finding for design. Young adults may be willing to use AI when it helps them organise information or receive more personalised insight, but they may not automatically trust it as an authority. The neutral and negative responses suggest that AI-based tools need to explain how recommendations are generated, what data are used and why particular pathways are suggested.

The role of AI should therefore be framed modestly. It should not be presented as a system that knows the user's correct future. Such a message could increase automation bias and reduce agency. A more defensible role is to use AI as a reflective support mechanism: it can identify patterns, surface alternatives and help users ask better questions. The final interpretation should remain with the user and, where the stakes are high or the user is distressed, with a qualified career professional.

The open-ended responses point in the same direction. Participants asked for practical labour-market data, realistic insights into everyday work, personalisation, simple visual presentation, tags and skill-tree structures. They were not asking only for a more advanced technology. They were asking for a clearer bridge between self-knowledge and real professional possibilities. This is a useful reminder that the value of AI in guidance depends less on its novelty than on whether it makes career information more understandable, relevant and actionable.

Overall, the findings support a cautious but constructive view of AI-supported career exploration. AI may help young adults widen the range of futures they can imagine, particularly around non-obvious and skills-related pathways. Its value lies in expanding the field of exploration, not in delivering final answers. In this sense, AI can help transform career uncertainty into a more structured form of curiosity, provided that the system remains transparent, contestable and connected to human guidance when needed.

## Limitations

This study has several limitations. First, the sample was relatively small, consisting of 80 participants, and the findings should therefore be interpreted as exploratory rather than representative of the wider population of young adults.

Second, the sample was limited to participants aged 18-24, with a strong presence of students and individuals connected to educational contexts. While this group is highly relevant to the topic of career uncertainty, the findings may not apply in the same way to older adults, mid-career workers or individuals undergoing later career transitions.

Third, the study relied on self-reported data. Participants' responses reflect perceived uncertainty, perceived knowledge and stated interest in career exploration tools. These perceptions are valuable, but they may not necessarily correspond to actual behaviour or long-term engagement with such tools.

Fourth, the analysis was descriptive and exploratory. AI-

though cross-tabulations were reviewed to identify possible patterns across gender, age and current life stage, these comparisons should be interpreted cautiously due to the sample size and the absence of inferential statistical testing.

Fifth, the study examined interest in AI-supported and interactive tools rather than actual use of a specific tool over time. Future research should examine how young adults interact with such tools in practice, whether these tools improve career clarity and whether they support more adaptive career decision-making longitudinally.

Finally, because the study was non-clinical and focused on vocational perceptions, the findings should not be interpreted as evidence that AI-supported career exploration reduces anxiety or improves mental health outcomes. Future studies may examine whether structured career exploration has indirect psychosocial benefits, but such claims require appropriate study designs and validated psychological measures.

## Conclusions

This exploratory study examined career uncertainty and openness to non-obvious careers in relation to artificial intelligence. In this sample, many young adults reported uncertainty, fear of making the wrong career decision and insufficient information about contemporary professional options. At the same time, they showed strong interest in discovering unfamiliar career paths, particularly when those paths were connected to their existing skills.

The findings suggest that career guidance should not only provide more information, but also help young adults connect personal competencies with emerging and less visible professional possibilities. AI-supported tools may contribute to this process when they are transparent, interactive and reflective. Their most appropriate role is to widen exploration and help users ask better questions, rather than to present a fixed answer about what a person should become.

AI should therefore be understood as a support mechanism within career guidance, not as a substitute for human judgement or counselling. When combined with ethical design, realistic labour-market information and opportunities for human interpretation, AI-supported exploration may help young adults navigate uncertainty with greater openness to non-obvious career paths. In a changing labour market, that openness may be an important part of career adaptability and sustainable professional development.

## Declarations

**Conflict of Interest:** The survey was conducted in the context of the development of FlameVerse AI, a career exploration platform concept focused on AI-supported and interactive career discovery. The author(s) are involved in the development of this concept/platform. This relationship is declared for transparency. The study was exploratory and the findings are not presented as evidence of the effectiveness, validation

or clinical impact of FlameVerse AI. No other conflicts of interest are reported.

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**Data Availability Statement:** The data that support the findings of this study are available from the corresponding author upon reasonable request. The dataset is not publicly available because it was collected as part of an exploratory, anonymous survey and was not originally designed as an open dataset.

**Ethics Statement:** Participation was voluntary and anonymous. Participants were informed about the general purpose of the survey before completing it, and completion of the questionnaire was considered consent to participate. No identifying personal data, clinical information or sensitive health data were collected. The survey involved adults aged 18-24 and was anonymous, minimal-risk and non-clinical. According to the authors' assessment, it fell within minimal-risk anonymous survey research; however, no formal institutional ethics review was obtained.

**Abbreviations:** AI: Artificial Intelligence, STARA: Smart Technology, Artificial Intelligence, Robotics and Algorithms

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