

Hybrid Human-AI Career Guidance: Opportunities, Challenges, and Future Directions

Brinceton Vaz¹, Khushboo Gupta², Dr. Jasbir Kaur³, Mansi Rajapurkar⁴, Ifrah Kampoo⁵

^{1,2}Distributed Student of Master of Computer Applications, Guru Nanak Institute of Management Studies, Matunga, Mumbai, India

³Director, GNIMS B-School, Head of Information Technology and HR, Guru Nanak Institute of Management Studies, Matunga, Mumbai, India

^{4,5}Assistant Professor, Guru Nanak Institute of Management Studies, Matunga, Mumbai, India

Abstract- Artificial intelligence significantly increases the scalability and personalization in career guidance. However, the volatility in the education and job market mean these systems must stay highly relevant to a person's local economy and individual needs. This study examines AI-based career guidance systems through secondary research, synthesizing literature on recommendation systems, explainable AI, and counselling frameworks. While AI improves accessibility, skill matching, and response efficiency, its limitations in empathy and contextual judgment constrain its effectiveness for complex career decisions. Analysis indicates that a completely automated system is neither feasible nor desirable. Instead, a collaborative model where AI manages routine and data-intensive tasks while human counsellors provide interpretation, reassurance, and ethical oversight to help provide the most credible path forward. This research concludes that integrated counselling combining AI efficiency with human judgment represents the optimal direction for future career guidance systems.

Keywords: Artificial intelligence, Career guidance, Counselling systems, Explainable AI, Algorithmic fairness, Trust, Privacy, Educational technology.

I. INTRODUCTION

AI is increasingly influencing how educational institutions, employers, and digital platforms support learning, skill development, and career planning. Recent advances in recommendation systems, learning analytics, and conversational AI have enabled the development of career guidance tools that can analyse educational backgrounds, skill profiles, interests, and labour market information to generate personalized recommendations [3], [4], [8]. As career pathways become more dynamic and skill requirements continue to evolve, students are expected to make decisions in environments characterized by rapid technological change and increasing uncertainty.

Traditional career counselling continues to play an important role in supporting these decisions. However, educational institutions often face challenges related to counsellor availability, growing student populations, and unequal access to guidance services [1], [2]. These challenges are particularly significant in developing countries, where students may have limited access to

professional career support despite facing increasingly complex educational and employment choices. AI-based career guidance systems have therefore emerged as a potential solution for expanding access to information and supporting decision-making at scale [4], [7].

Research has identified several advantages associated with the use of AI in career guidance. These systems can provide continuous access to guidance services, identify skill gaps, analyse labour market trends, and generate recommendations tailored to individual users [4], [8], [9]. Recent studies also suggest that AI-driven tools can improve career exploration and reduce uncertainty by helping students better understand available educational and professional opportunities [13]. Such capabilities have increased interest in the use of AI to support career development within educational settings.

Despite these benefits, the use of AI in career guidance raises important concerns. Questions related to explainability, fairness, privacy, and accountability have become increasingly prominent as educational institutions adopt data-driven

decision-support systems [5], [6]. Career decisions are rarely determined by measurable indicators alone. Factors such as family expectations, financial circumstances, personal values, confidence, and cultural influences often play a significant role in shaping career choices [10], [11]. While AI systems can process information efficiently and identify patterns within large datasets, they may struggle to account for these contextual and human dimensions of decision-making.

As a result, recent research has increasingly shifted away from viewing AI as a replacement for career counsellors and toward understanding how AI can complement human expertise [7], [8], [12]. Human-centred approaches emphasize the importance of combining computational capabilities with professional judgement, ethical oversight, and contextual understanding [12]. Within career guidance, this perspective suggests that AI should support rather than replace counselling processes.

This study examines the opportunities, challenges, and future directions of AI-powered career guidance systems through a qualitative review of existing literature. Rather than evaluating whether AI can replace human counsellors, the study explores how AI and human expertise can work together to support more effective career decision-making. Particular attention is given to issues of personalization, explainability, fairness, privacy, accessibility, and the practical role of hybrid human–AI counselling models in educational environments.

Research Objectives

The objectives of this study are:

- To examine the role of artificial intelligence in contemporary career guidance systems.
- To analyse the opportunities offered by AI, including personalization, accessibility, and data-driven decision support.
- To identify the major challenges associated with AI-powered career guidance, particularly those related to explainability, fairness, privacy, and contextual understanding.

- To evaluate the continuing role of human counsellors within technology-supported guidance environments.
- To examine the potential of hybrid human–AI counselling models as an approach to career guidance.

Research Questions

RQ1: How does artificial intelligence contribute to the accessibility and personalization in career guidance systems?

RQ2: What challenges and limitations affect the effectiveness of AI-powered career guidance?

RQ3: Why do human counsellors remain important within AI-supported career guidance environments?

RQ4: How can hybrid human–AI counselling models support more effective career decision-making?

The remainder of the paper is organized as follows. Section II reviews existing literature on AI-powered career guidance systems, explainable AI, human-centred approaches, and career development theories. Section III outlines the research methodology. Section IV discusses the opportunities and limitations of AI in career guidance and examines the case for hybrid counselling models. Section V presents the conclusions, while Section VI highlights directions for future research.

II. LITERATURE REVIEW

A. Foundations: What AI Can Do in Career Guidance
Artificial intelligence has changed the way career guidance systems are designed and delivered. In this field, AI is primarily used to analyse large volumes of student data, identify patterns in skills and interests, and generate recommendations that can support career decision-making [4], [8], [9]. Recommendation systems, learning analytics, and conversational interfaces allow guidance platforms to move beyond static information delivery and toward more responsive and personalized support. This is especially important in educational settings where students need timely help but counsellor availability is limited.

Recent work shows that AI-based career guidance tools can process academic records, skill profiles, job

market trends, and user preferences to produce tailored suggestions for educational and career pathways [4], [8]. These systems are particularly valuable because they can operate continuously, respond quickly, and support many users at once. In this sense, AI does not replace career guidance as a service, but changes its scale and delivery. The literature therefore presents AI as a tool for expanding access to guidance, improving responsiveness, and helping users explore career options earlier and more systematically.

B. Opportunities: Personalization, Access, and Evidence-Based Support

One of the strongest advantages of AI in career guidance is personalization. Unlike conventional guidance models, which often rely on general advice, AI systems can use individual data to produce more specific recommendations [4], [9], [13]. This makes it possible to align educational choices with a student's skill profile, academic performance, and career interests. Personalization is important because career planning is not a one-size-fits-all process. Students differ in abilities, goals, confidence, and opportunities, so guidance systems that adapt to individual profiles are more likely to be useful.

A second major opportunity is access. AI-powered systems can provide guidance at any time, support large numbers of learners simultaneously, and reduce dependence on scarce counsellor resources [1], [2], [4]. This is especially relevant in developing contexts, where many students may not have regular access to trained career counsellors. Digital systems can help fill this gap by making career-related support more widely available and by extending guidance services beyond traditional office hours or physical locations.

A third benefit is evidence-based decision support. AI systems can incorporate labour market information, emerging skill demands, and educational pathways into their recommendations [3], [8], [9]. This allows students to make decisions based not only on personal interest but also on broader employment trends. When used carefully, this can make career guidance more practical and more relevant to current economic conditions. The

literature suggests that this data-driven approach can support early career exploration, identify skill gaps, and help students better understand the relationship between education and employability [4], [10].

C. Challenges: Explainability, Fairness, and Privacy

Despite these advantages, the literature also identifies serious limitations. The first is explainability. Many AI systems produce recommendations through complex models that are not easy for users to understand [5]. In a career guidance context, this is a major issue because students are not simply selecting a product or browsing information; they are making decisions that may affect their education, finances, and long-term future. If the reasoning behind a recommendation is not clear, users may hesitate to trust it or may accept it without proper reflection. Explainability is therefore not a minor technical feature but a central requirement for responsible use.

The second challenge is fairness. AI systems learn from data, and data often reflect existing social and institutional inequalities [6], [9]. If historical outcomes are shaped by unequal access to education, resources, or opportunities, then recommendation systems may reproduce those same patterns. In career guidance, this is especially concerning because a system may unintentionally favour students from well-resourced backgrounds while offering less useful guidance to students from rural schools, regional language backgrounds, or economically disadvantaged communities. The literature therefore treats fairness not as a separate concern, but as something that must be built into the design and evaluation of AI systems.

The third issue is privacy. Career guidance systems often collect highly sensitive information such as academic performance, behavioural indicators, career preferences, and personal interests [1], [3], [6]. While this data can improve recommendations, it also creates risks if handled without transparency and proper governance. Students may not be willing to share honest information if they are unsure how it

will be used. The literature shows that trust in AI systems depends not only on how accurate the recommendations are, but also on how responsibly data is collected, stored, and interpreted.

These three issues are interconnected. Poor explainability can weaken trust. Weak privacy protection can reduce openness from users. Bias in data can distort recommendations and damage fairness. The literature therefore suggests that an effective AI-based career guidance system must address all three together, rather than treating them as separate technical problems.

D. Contextual Factors: Why Data Alone Is Not Enough

Another important theme in the literature is that career choice is not determined by data alone. Even when an AI system correctly identifies a student's strengths or predicts a suitable career path, the recommendation may still fail to reflect the student's real situation [7], [10], [11]. Career decisions are shaped by financial constraints, family expectations, confidence, identity, cultural background, and access to local opportunities. These factors are difficult to capture fully in structured data.

This is why the literature increasingly distinguishes between prediction and guidance. A system may predict a suitable pathway, but real guidance requires interpretation. Students do not make decisions in a vacuum; they evaluate options in relation to what is affordable, possible, and acceptable in their own context. This is one of the most important reasons why AI should not be treated as a complete replacement for human judgement. Career guidance requires more than matching skills to occupations; it requires understanding the meaning of those choices in the life of the student.

Career construction theory supports this view by showing that career development is shaped by personal meaning and life circumstances, not only by aptitude or interest [10], [11]. In other words, the literature suggests that effective career guidance must account for both measurable data and human

context. AI can support the first, but human judgement remains essential for the second.

E. Emerging Solutions: Human-Centered and Hybrid Approaches

Because of these limitations, the literature increasingly supports human-centered and hybrid models rather than fully automated systems [7], [12], [13]. Human-centered AI emphasizes that intelligent systems should assist human decision-makers rather than replace them [12]. In career guidance, this means AI should handle tasks such as filtering information, identifying patterns, and generating preliminary recommendations, while counsellors retain responsibility for interpretation, support, and final guidance.

This approach is also supported by recent studies on computer-assisted career guidance systems and AI in career counselling [4], [7], [8], [9]. These studies suggest that the most effective systems are not those that automate everything, but those that combine computational efficiency with professional judgement. In such models, AI supports scale and responsiveness, while human counsellors provide empathy, ethical oversight, and contextual understanding. This division of labour is practical because it allows each side to do what it does best. The hybrid model also addresses the trust problem. Users are more likely to accept recommendations when they know a human expert is available to interpret or question the system's output. It also reduces the risk of overdependence on automated recommendations. Rather than presenting AI as an authority, the literature increasingly frames it as a support mechanism within a broader counselling process. This is the strongest and most defensible position for education-focused career guidance.

F. Developing Contexts: Why This Matters in India

The need for a hybrid model becomes even more important in developing contexts such as India. The literature notes that educational support systems are uneven across regions, and that access to digital tools, counselling services, and reliable infrastructure differs widely between students [1], [2], [3]. In such environments, AI can help expand access to basic

guidance, but it cannot fully solve problems related to language diversity, digital literacy, unequal resources, or social inequality.

This is why context matters so much. A recommendation system that works well in a well-resourced urban institution may not work in the same way for a student in a rural or under-resourced setting. The literature on AI in education and career development suggests that systems must be adapted to local realities if they are to be useful [1], [3], [8], [9]. In India, that means considering multilingual access, affordability, uneven counselling availability, and the need for stronger human support in decision-making.

Recent research also suggests that students are open to computer-assisted career guidance, but not necessarily to fully replacing human counselling [7], [13]. This is an important point for the present study. It indicates that the future of career guidance is not fully automated decision-making, but collaborative support systems that combine AI tools with human expertise. For developing contexts, this is likely to be the most sustainable and realistic approach.

G. Synthesis and Research Gap

Overall, the literature shows a clear pattern. AI can improve personalization, access, and information processing in career guidance [4], [8], [9]. At the same time, explainability, fairness, privacy, and contextual understanding remain unresolved challenges [5], [6], [10], [12]. These findings suggest that AI should not be evaluated only by how accurately it predicts career options, but by how responsibly it supports real student decisions.

The main gap in the literature is that many studies examine either the technical side of AI or the ethical side, but fewer studies bring these together within a practical career guidance framework. There is still limited integrated discussion of how AI recommendations should be used alongside human judgement in real educational environments, especially in developing contexts such as India. This study addresses that gap by arguing that hybrid human–AI counselling is the most practical and

responsible direction for future career guidance systems.

III. METHODOLOGY

A. Research Approach

This study adopts a qualitative literature review approach to examine the role of artificial intelligence in career guidance systems. The objective is not to measure system performance experimentally, but to synthesize existing scholarship on AI capabilities, limitations, and the emerging case for hybrid human–AI counselling models. This approach is appropriate because the research questions are conceptual and analytical in nature, focusing on how AI supports career guidance, what challenges limit its effectiveness, and why human judgement remains necessary in career decision-making.

The review was guided by four research questions developed during the research design phase. These questions shaped the literature search strategy, the selection of sources, and the thematic organization of the analysis. Rather than attempting to cover every publication in the field, the study prioritized sources that directly addressed the relationship between AI, career guidance, explainability, fairness, privacy, and human-centred support. This made it possible to develop a focused synthesis of the literature while keeping the argument aligned with the paper's central thesis.

B. Literature Search Strategy

The literature search was conducted across a set of academic, policy, and professional sources relevant to education, technology, and career development. The search included major databases and institutional repositories such as Scopus, ERIC, Google Scholar, OECD iLibrary, UNESCO resources, and other scholarly platforms covering education, computer science, and related fields. These sources were selected to ensure coverage of both peer-reviewed research and authoritative policy literature. A structured set of keywords and Boolean combinations was used to identify relevant studies. Core search terms included combinations of the following concepts: artificial intelligence, machine learning, recommendation systems, career guidance,

career counselling, career development, vocational guidance, explainability, fairness, privacy, human-centred AI, hybrid models, personalization, and educational decision support. Additional focused searches were conducted for themes such as explainable AI in education, algorithmic bias, human-AI collaboration, and career guidance in developing contexts.

The review prioritized literature published between 2019 and 2026, with earlier foundational works included when they were essential for theory or conceptual framing. This period was selected to capture recent developments in AI-enabled recommendation systems, learning analytics, responsible AI, and human-centred design, all of which are directly relevant to contemporary career guidance systems. Foundational sources on career construction theory and human-centred AI were included because they provide the theoretical basis for interpreting the literature on hybrid counselling models.

C. Selection Criteria

To maintain relevance and academic quality, explicit inclusion and exclusion criteria were applied.

Inclusion Criteria

Sources were included if they met the following conditions:

1. They addressed artificial intelligence, machine learning, algorithms, or data-driven systems in educational, career, or counselling contexts.
2. They discussed at least one major issue relevant to this study, such as personalization, accessibility, explainability, fairness, privacy, trust, or human-AI interaction.
3. They provided empirical evidence, conceptual analysis, a systematic review, a scoping review, or an authoritative policy perspective.
4. They were published in peer-reviewed journals, recognized conference proceedings, or institutional reports from credible organizations such as UNESCO, OECD, or NIST.
5. They were available in English and contained sufficient detail for thematic analysis.

Exclusion Criteria

Sources were excluded if they:

1. Focused only on technical AI development without a clear connection to career guidance or education.
2. Were opinion pieces, editorials, promotional material, or unsupported commentary.
3. Addressed historical career guidance systems without reference to contemporary AI-based approaches.
4. Were duplicates, highly repetitive, or too weak in methodological detail to support the analysis.
5. Lacked sufficient relevance to the paper's core themes.

D. Source Selection and Refinement

The initial search identified a broader set of potentially relevant studies. After screening titles, abstracts, and full texts against the inclusion criteria, the review narrowed the literature to a focused set of 13 core sources, along with 2 foundational theoretical works on career construction and human-centred AI. These were selected because they directly supported the four research questions and the paper's central argument regarding hybrid human-AI counselling.

Rather than treating all sources equally, the review prioritized studies that contributed directly to one or more of the following analytical concerns: AI capabilities in career guidance, explainability and trust, fairness and privacy, contextual limitations, and the role of human counsellors. This ensured that the review remained conceptually coherent and did not drift into unrelated technical discussions.

E. Analytical Framework and Thematic Analysis

The selected sources were analysed using thematic analysis. This method was chosen because the aim of the study was to identify recurring patterns, tensions, and conceptual relationships across the literature rather than to test a statistical hypothesis. Each source was read carefully, and key claims, findings, and theoretical ideas were coded according to the research questions.

The analysis proceeded in three stages.

First, the sources were read in full and initial notes were made on the main contributions of each study. During this stage, the review focused on identifying how each source addressed AI capabilities, limitations, and human roles in career guidance.

Second, recurring codes were grouped into broader themes. These included AI-driven personalization, access and scalability, explainability, fairness, privacy, contextual limitations, and collaborative human–AI models. Connections between these themes were also noted, particularly where one issue strengthened or depended on another. For example, explainability was closely linked to trust, while fairness was closely linked to data quality and institutional accountability.

Third, the themes were synthesised into a coherent interpretation of the literature. This synthesis showed that the literature does not support a fully automated view of career guidance. Instead, it suggests that AI is most useful when it supports human counsellors by handling repetitive and data-intensive tasks, while human professionals retain responsibility for interpretation, ethical judgement, and contextual decision-making.

F. Theoretical Framework

The analysis was grounded in two theoretical perspectives: Career Construction Theory and Human-Centred AI. Career Construction Theory is useful because it treats career decisions as shaped by personal meaning, life circumstances, and social context rather than by aptitude alone. This is important for understanding why algorithmic recommendations may be incomplete if they ignore the realities of a student's situation.

Human-Centred AI provides the second lens for the study. It emphasizes that AI systems should augment human judgement rather than replace it, especially in high-stakes contexts where trust, responsibility, and context matter. Together, these frameworks support the paper's central argument that career guidance should be understood as a collaborative process in which AI contributes scale, speed, and pattern recognition, while human counsellors

contribute interpretation, reassurance, and ethical oversight.

G. Quality and Rigor Considerations

Several steps were taken to improve the transparency and credibility of the review. The search terms, selection criteria, and analytical process were defined in advance to reduce arbitrary source selection. Preference was given to peer-reviewed and institutionally credible sources. Foundational sources were included only when they contributed essential theoretical insight.

At the same time, the study acknowledges that qualitative literature reviews involve interpretation. The thematic synthesis reflects the researcher's judgement in identifying patterns across studies, and some degree of subjectivity is unavoidable. To limit this, the review focused on sources that directly addressed the paper's core themes and avoided overgeneralizing from weak or unrelated material.

H. Scope and Limitations

This study focuses specifically on AI-powered career guidance systems in educational contexts, with particular attention to implications for India and similar developing settings. While the literature reviewed includes sources from both policy and academic domains, most of the evidence originates from developed-country contexts. As a result, the study interprets these findings cautiously when applying them to India.

The review also has some limitations. It is restricted to English-language sources, which may exclude useful work in other languages. It does not claim to be a full systematic review in the strict meta-analytic sense, but rather a structured qualitative synthesis of the most relevant literature. In addition, because the field is evolving quickly, some findings may change as AI tools, educational platforms, and governance frameworks continue to develop.

I. Link to the Research Questions

This methodology was designed to ensure that each research question could be addressed through the literature. The sources selected for the review provide evidence on AI's contribution to accessibility

and personalization, the challenges related to explainability, fairness, and privacy, the continuing importance of human counsellors, and the practical case for hybrid human–AI counselling models. In this way, the methodology supports a conceptual analysis of AI in career guidance while keeping the final argument grounded in the literature.

IV. DISCUSSION

The reviewed literature suggests that artificial intelligence is most useful in career guidance when it functions as a supporting layer rather than as the final decision-making authority. Its main value lies in extending access to counselling services, processing large amounts of information quickly, and supporting early-stage exploration, particularly in settings where counsellor availability is limited. These benefits are already reflected in the paper's literature review, which notes that AI-based systems can improve personalization, scalability, and continuous access to guidance [4], [10], [11]. However, the same review also shows that these advantages matter only when the system remains connected to human interpretation, emotional support, and contextual judgment [7], [13].

A central issue is the gap between algorithmic output and lived reality. A recommendation may be technically accurate in terms of academic profile, skills, or job-market trends, yet still be unsuitable for a student whose choices are shaped by financial limits, family expectations, language barriers, or uneven access to educational resources. The paper already identifies this problem in its discussion of career decision-making as something shaped by confidence, family expectations, financial conditions, and personal identity rather than by data alone [7]. This is especially relevant in India, where access to counselling and educational support is uneven across institutions and regions [1], [2], [3]. In such contexts, AI should be treated as a screening and support mechanism, not as a substitute for professional judgment.

The discussion of explainability shows that trust in career guidance systems cannot come from prediction quality alone. Students are more likely to

accept guidance when they understand why a recommendation was generated and can judge whether it fits their interests, abilities, and longer-term goals. This aligns with the paper's argument that explainability supports reflection and informed decision-making, not just transparency [5], [13]. In career guidance, this matters more than in ordinary recommendation systems because the output can influence educational choices, financial commitments, and long-term professional direction [1], [7]. A system that cannot explain itself clearly may still produce a recommendation, but it is less likely to produce confidence.

Fairness is another major concern. Bias is often described as a data problem, but the issue is broader than dataset quality alone. Recommendation systems learn from patterns already visible in the information they are trained on, which means they can reproduce inequalities linked to socioeconomic status, institutional advantage, or unequal access to opportunity [6], [9]. In the context of career guidance, this is especially important because biased recommendations can shape educational pathways and employment outcomes. For that reason, fairness should be treated as an ongoing responsibility, requiring regular monitoring and review rather than a one-time design fix [6], [9].

Privacy is closely connected to trust. Career guidance platforms often collect sensitive information such as academic records, interests, behavioural indicators, and personal preferences [1]. While such data can improve recommendation quality, students may hesitate to provide them honestly if they are unsure how the information will be stored, interpreted, or shared. This means that responsible career guidance systems must combine technical performance with institutional accountability [1], [3], [6]. Without that trust, even a well-designed system may fail in practice because users will not engage with it honestly.

Accessibility raises a similar issue. A digital system may be technically available, but that does not mean it is meaningfully accessible. Differences in internet connectivity, device availability, language proficiency, and digital literacy can strongly affect

whether students can use a platform effectively [1], [2], [10]. In this sense, accessibility should be understood as the ability of diverse users to understand, navigate, and benefit from the guidance provided, not merely the existence of an online tool. This distinction matters because a system that works well for digitally confident users may still exclude first-generation learners or students in under-resourced settings.

The practical value of this division becomes clear in real student decisions. For example, a system may recommend data analytics, software engineering, or business intelligence based on performance and skill profiles. A counsellor can then assess whether those paths fit the student's financial situation, family expectations, personal interests, and long-term goals. The recommendation becomes more useful not because human judgment replaces algorithmic analysis, but because it places the output in the student's actual context. This is consistent with career construction theory, which treats career decisions as shaped by personal meaning and life circumstances rather than by aptitude alone [11], [12].

Overall, the evidence supports a balanced view of artificial intelligence in career guidance. AI can improve scale, responsiveness, and personalization, especially where counselling resources are limited [4], [10]. At the same time, explainability, fairness, privacy, digital inclusion, and contextual understanding remain difficult to solve through automation alone [1], [3], [5], [6], [9], [13]. For India and similar developing contexts, the most credible path forward is a hybrid model that combines technological capability with professional human judgment, so that efficiency does not come at the expense of equity, trust, or individual understanding [1], [2], [3], [7], [13].

V. CONCLUSION

This study examined the role of artificial intelligence in career guidance, with particular attention to its opportunities, limitations, and suitability for hybrid human–AI counselling. The literature reviewed in this paper shows that AI can improve access to guidance,

support personalization, and help students explore career options more efficiently. These capabilities are especially valuable in institutions where counselling resources are limited and where students need quick, data-informed support at scale.

At the same time, the review shows that AI cannot replace human judgement in career decision-making. Issues such as explainability, fairness, privacy, accessibility, and contextual understanding make fully automated guidance unsuitable for complex career choices. Career decisions are shaped not only by academic performance and skill profiles, but also by financial conditions, family expectations, language background, confidence, and individual aspirations. For this reason, algorithmic recommendations alone are not enough to provide complete or ethically sufficient career guidance.

The study therefore supports a hybrid human–AI model as the most practical and responsible direction for future career guidance systems. In this model, AI can manage repetitive and data-intensive tasks, while human counsellors provide interpretation, reassurance, ethical oversight, and contextual support. This approach is particularly relevant for India and similar developing contexts, where diversity, inequality, and uneven access to counselling services must be considered alongside technological efficiency. Overall, the findings suggest that the future of career guidance lies not in replacing counsellors with machines, but in combining the strengths of both to create guidance that is scalable, trustworthy, and responsive to real student needs.

VI. FUTURE SCOPE

Future research on AI-powered career guidance should focus on improving how these systems support real student decisions rather than simply increasing automation. A key direction is the development of more explainable models that can clearly show why a particular career path or learning option is recommended. In counselling settings, this is important because students need more than a prediction; they need reasons that they can understand and discuss.

Another important area is fairness and bias monitoring. Future studies should examine whether recommendations differ across students from rural and urban backgrounds, different language groups, and different socioeconomic settings. This is especially relevant in India, where access to digital tools, counselling support, and educational opportunity is uneven. Research in this area can help ensure that AI systems do not unintentionally reflect or deepen existing inequalities.

Privacy and data governance also require further attention. Career guidance platforms often rely on sensitive information such as academic records, interests, behavioural patterns, and personal preferences. Future work should study how this information can be collected, stored, and used responsibly so that students remain willing to engage honestly with the system.

A further direction is the design of stronger hybrid human–AI models. Instead of attempting full automation, future systems should support shared decision-making in which AI handles pattern recognition, information filtering, and initial recommendations, while human counsellors provide interpretation, reassurance, and contextual judgment. This kind of model is more realistic for educational environments where personal circumstances matter as much as data.

Finally, more context-specific research is needed in multilingual and resource-diverse environments. Studies focused on Indian institutions can help identify how career guidance systems should be adapted for local languages, varying digital literacy levels, and unequal access to counselling. Such work would make AI-based career guidance more inclusive, practical, and relevant to the students who need it most

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