Counselling Career with Artificial Intelligence: A Systematic Review

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Abstract
This systematic review aimed to review empirical research on leftist counseling careers with AI. This research applied SLR and evaluated Scopus, PubMed, Google Scholar, and Crossref databases. The results showed n = 43 on Scopus, n = 3 on PubMed, n = 70 on Google Scholar and n = 3000 on Crossref. After PRISMA analysis, n = 14 studies were included in the review. Studies examining career counseling with AI: (Carson et al., 1999; Crowley, 1992; Guleria & Sood, 2023; Hendahewa et al., 2006; José-García et al., 2022; Joshi et al., 2020; Lee et al., 2018; Liu, 2023; Nazareno et al., 2019; Suresh et al., 2021; Westman et al., 2021a; Yan et al., 2019; Zhang et al., 2022; Zhang & Zheng, 2022). The manuscripts' publication years also varied: 1992, 1999, 2006, 2018, 2019, 2020, 2021, 2022, and 2023. This study was conducted in Namibia, the USA, the UK, China, Romania, India, Sri Lanka, the Philippines, South Korea, and Finland. System: computer algorithm, artificial neural network, AIED, C3-IoC, Facebook Messenger, iAdvice, and online career counselor system (Chatbot and machine learning). Objectives: career prediction, career matching with companies, career selection, career guidance, and career decision-making. Requirements: AI supports students in study and career planning, self-management, and accessible and timely advice, whether delivered by AI or humans. AI is a technical subject with personal, career, and social implications; it is essential for developing academic and professional thinking and career planning in the AI era.

Keywords: Counselling; Career; Artificial Intelligence

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INTRODUCTION

The use of artificial intelligence (AI) in counseling was studied by (Illovsky, 1994) 29 years ago. He suggests that many counselors and the individuals they serve may react negatively to artificial intelligence (AI) and expert systems due to their connections to mathematics, technology, and machines. However, the use of an expert system affords the user the opportunity for active participation, and the user can work at his or her own tempo, possibly enhancing a feeling of control. With the accelerated advancement and expansion of technology, it is evident that AI will play a role in counseling. In the year 2016, a number of prominent multinational corporations established strategic partnerships with the aim of promoting the responsible advancement of artificial intelligence (AI), as documented by (Gaggioli, 2017). The "Partnership on Artificial Intelligence to Benefit People and Society" is an alliance consisting of prominent technology companies such as Amazon, Apple, Deep Mind, Google, Facebook, IBM, and Microsoft. This collaborative initiative aims to foster interdisciplinary approaches to artificial intelligence (AI) and its societal implications.

Due of the rapid and continuous advancements in AI, which have transformed it into an interdisciplinary domain, it is challenging for a single article to comprehensively encapsulate its whole scope and influence. A crucial yet unexplored research topic is how AI affects varied clinical counseling clients and how to minimize prejudice and discrimination in AI. AI-counseling research must evolve (Fulmer, 2019). The counseling community needs additional data on how AI services affect those who desire human engagement because they feel unheard, invisible, and unworthy of attention. The transition away from human-to-human connection in counseling and other disciplines might pose many unanswered existential problems. These existential questions may require closer attention and preparation by researchers and counselors who specialize in human emotions and crises (Green, 2018).

According to (Westman et al., 2021b), AI in counseling should help students with academic and career planning and self-management. Students like AI career guidance. They stress accessible and timely instruction, whether from AI or people. AI can identify weak signals and "boost" guiding interventions before students or staff notice.

Counselors have long expected AI to enter their field (Illovsky, 1994; SHARF, 1985). But only in the last decade have breakthroughs in computer processing power, natural language processing, and artificial neural networks resulted in a new generation of AI capabilities (Hirschberg & Manning, 2015; Russell & Norvig, 2010). These advancements have put AI in the spotlight. Health professionals use AI for clinical training, treatment, evaluation, and decision-making (Hamet & Tremblay, 2017). AI is now an interdisciplinary topic that is sometimes linked to therapy.

This study investigates artificial intelligence-based career counseling. There is no available empirical research evaluation that concentrates on AI-assisted career counseling, which distinguishes this review study from others. There are currently a dearth of descriptive, correlative, or experimental articles on AI in the counseling literature (Fulmer, 2019)

In the context of artificial intelligence, (Liu, 2023) argues that it is imperative to prioritize students' capacity to adapt their career trajectories in response to unpredictable circumstances. This emphasis is crucial in enabling students to cultivate AI-related proficiencies, thereby facilitating their pursuit of diverse and sustainable career paths. Simultaneously, it is important to note that professional education encompasses more than just classroom instruction, since it encompasses other components such as corporate entities, families, and communities, which together create an interconnected system. The

successful realization of high-quality employment necessitates a commitment to staying abreast of the latest advancements in artificial intelligence and prioritizing the requirements of societal progress.

The objective of this study is to comprehensively analyze the current body of literature pertaining to the use of artificial intelligence in the field in career counseling. There are three objectives that are intended to address the following research inquiries: 1) Is there an artificial intelligence system used in career counseling? 2) Is there a goal for using artificial intelligence in career counseling? 3) Are there requirements for using artificial intelligence in career counseling?

The study used the Publish or Perish (PoP) program and developed specific search phrases to comprehensively explore relevant research. A systematic search was conducted across many data sources including Scopus, Google Scholar, CrosReff, and PubMed, with the aim of obtaining a conclusive response to the research query. The selection of studies was conducted based on predetermined inclusion and exclusion criteria, after a thorough analysis.

The integration of artificial intelligence and counseling has resulted in the emergence of interactive platforms. The future prospects of their link will mostly hinge upon the development rate of artificial intelligence (AI), which, assuming the present patterns persist, is projected to fall within the spectrum ranging from linear to exponential. The exponential advancement of technology holds the potential to enhance the skills of artificial intelligence (AI) systems. Currently, these systems have limited capacities in terms of inquiry, but with exponential development, they could acquire more advanced judgement and diagnostic capabilities. Furthermore, they could possibly embody the ethical, cognitive, emotional, and relational traits of a therapist (Jennings et al., 2005; Skovholt & Jennings, 2004).

Guidance and counseling services include personal services, the field of learning services, the field of social services, and career services (Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 111 Concerning Guidance and Counseling in Elementary and Secondary Education, 2014; Muhammad & Patriana, 2021).

The primary objective of career counseling is the exploration and comprehension of one's self, including personal attributes, aptitudes, and proficiencies (Vignesh et al., 2021). Career counselling is a comprehensive field that comprises many services and activities aimed at providing support to individuals across all age groups and life stages. Its primary objective is to facilitate individuals in making well-informed decisions regarding their education, training, employment, and overall career development (OECD, 2004). This word encompasses both individual and group counselling activities. The range of services offered encompasses the provision of information, self-assessment opportunities, and counselling sessions facilitated by highly skilled professionals in the field of guidance. In recent years, career counseling has placed significant emphasis on the need of upskilling and reskilling as part of continuing education (Toni & Vuorinen, 2020).

Artificial intelligence (AI) is often defined as the technological field concerned with endowing computers and machines with the ability to exhibit intelligent behavior. The machine in question is often seen as a means of replacing human labor in order to achieve more efficiency and superior performance. According to (A. Kaplan & Haenlein, 2019), this phenomenon is often referred to as "a system" that has the ability to effectively comprehend external input, acquire knowledge from it, and use that knowledge to accomplish predetermined goals and tasks via adaptable adjustments. Artificial intelligence (AI) is a field that focuses on the development of technologies and computer systems that are

designed to aid people in problem-solving and enhance their efficiency, irrespective of the specific definition used. This refers to intelligence that is developed by humans and displayed by machines. Artificial Intelligence (AI), as defined by (Russell & Norvig, 2010), refers to the human-created tools that replicate the cognitive abilities shown by the human brain.

Digital tools have the potential to provide users enhanced chances for accessing assistance at any time and from any location, therefore broadening the scope of available services. The use of technology in career guidance has the potential to yield many advantages. These advantages include enhanced accessibility, expanded availability of information, improved evaluation capabilities, and higher networking opportunities. Additionally, the integration of technology may lead to lower total expenses and enhanced cost-effectiveness (Sampson et al., 2020). The COVID-19 pandemic has resulted in an escalated demand for remote and digital guidance services (Cedefop et al., 2021). Machine learning advancements facilitate the use of a data-centric methodology, whereby versatile algorithms autonomously acquire knowledge from data (Schmidhuber, 2015).

Aafjes-van Doorn employed artificial intelligence (AI) in a research endeavour to identify the interpersonal abilities that empirical data indicates are of utmost significance for therapists to cultivate, irrespective of the specific therapeutic approach they employ. The characteristics that encompass these common factors are referred to as Facilitative Interpersonal Skills (FIS). These skills encompass various aspects, including but not limited to, prioritising the therapeutic relationship, demonstrating empathy, and fostering optimism and positive expectations (Anderson et al., 2009). “AI will never completely replace humans, but it may require us to raise awareness and educate ourselves on how to use it safely,” said Joshi. "If we do that, AI can improve game psychology in many ways." (Abrams, 2023).

As to the American Counselling Association (ACA), counselling is defined as a professional partnership that facilitates individuals, families, and institutions in achieving mental health, holistic well-being, educational, and career goals (D. M. Kaplan et al., 2014). The concept provided may be deconstructed into three fundamental components of counseling, namely: (a) establishing professional alliances, (b) fostering empowerment, and (c) attaining objectives (Fulmer, 2019).

The implementation of counseling interventions requires the adherence to three fundamental foundations. Nevertheless, it might be argued that if an AI fulfills one or two of the stipulated criteria, it is progressively approaching the level of operating as, if not attaining the status of, a counselor. For instance, an artificial intelligence system that has the capability to assist persons in attaining their health objectives might be considered to partly fulfill the role of a counselor, as it satisfies two out of the three necessary criteria. The possible integration of artificial intelligence (AI) in counseling may result in the fulfillment or even the surpassing of the counselor's duty by AI (Fulmer, 2019).

Based on an extensive examination of scholarly study and literature reviews undertaken by (Khare et al., 2018; Martiniello et al., 2020; Zawacki-Richter et al., 2019), it has been ascertained that artificial intelligence (AI) exhibits promise in the realm of education by enabling a variety of activities. The aforementioned roles involve several aspects such as student self-regulation, motivation, well-being, personalised learning support, and feedback. Furthermore, artificial intelligence (AI) has the potential to make valuable contributions in various aspects of the educational journey. It can assist in providing support and guidance during the learning process, aid in the assessment and evaluation of students, enable the creation of profiles and predictions, improve usability

and accessibility, optimise the allocation of resources, and streamline the management of competencies.

A multitude of scientific inquiries have been undertaken to assess the cost-effectiveness of artificial intelligence (AI) in the field of career guidance. The present investigation, carried out by (Khare et al., 2018), aimed to assess the influence of artificial intelligence on student experiences, with a specific focus on its role in providing academic support. The researchers have arrived at the conclusion that artificial intelligence (AI) possesses the capacity to yield positive effects on pupils, as well as many aspects of educational systems, encompassing organisations, structures, procedures, and persons. Although (Khare et al., 2018), do not expressly categorize their research as being under the umbrella of advice, they provide practical examples that span the student life cycle. These examples facilitate the reflection on learning skills and opportunities, as well as the transfer to the professional working environment. This aligns with the primary purpose of career guidance.

According to (Hooley et al., 2015), the use of technology by guidance staff has historically included three primary functions. These functions include the provision of learning and career information to facilitate professional development, the implementation of automated interactions such as career evaluations, simulations, or games, and the utilization of various communication choices. The development of integrated or blended advice, which involves using digital methods for guidance purposes, requires careful planning by guidance specialists and service designers in determining the appropriate technology to use and the manner in which it should be utilized. According to the study conducted by (Bakke et al., 2018).

AI career counseling requirements. According to (Green, 2018), ethical problems surrounding AI should influence study on how AI counseling services might prevent undesirable side effects, overgeneralization, and investigation of potentially harmful methodologies and approaches. Also, AI functions must be transparent to designers, builders, implementers, and users. Data security and privacy are further ethical issues with AI services. The research should aim to determine whether counsellors and clients necessitate understanding of AI technology and its deployment in order to ensure fairness, compassion, and ethical conduct in their practise, as well as to safeguard their safety and overall well-being (Green, 2018).

According to the results of Westman and his colleagues' study (Westman et al., 2021b), one of the required needs is that students must explain every process that supports AI as part of their regular learning activities rather than using a separate application. Students have been required to successfully organize their timetables and workloads throughout their academic careers, in addition to developing effective learning strategies. The desire for improved communication and feedback between professors and students is something that students have mentioned. Students also explored the significance of having support from peers and the role that artificial intelligence may play in mediating this assistance.

The staff members contemplate the potential function of artificial intelligence (AI) in the identification and validation of earlier learning experiences, as well as in forecasting future competence demands. The staff engages in discussions on the use of competence or skill data by artificial intelligence (AI) systems. It is acknowledged that while there are several sources of data, it is possible that students may not have access to all of them. The use of artificial intelligence (AI) in the organization of this data will provide a more proactive

engagement of students in their own learning and career planning endeavors (Westman et al., 2021b).

METHOD

Search Strategy and Population

The PRISMA framework, as outlined by (Liberati et al., 2009), is utilised to facilitate the identification, screening, and evaluation of records for the purpose of determining their eligibility and inclusion in systematic reviews and meta-analyses. The eligibility criteria were described using modified PICO (population, intervention, comparison, and outcome) methodologies and PEO (population, exposure, and outcome) (Pollock & Berge, 2018) objectives. Using the publish or perish application, I searched the Scopus, PubMed, CrossRef, and Google Scholar databases for the month of July 2023. Initial identification of articles was conducted by relevant authors, and screening was verified.

The use of population in this study refers to (Pollock & Berge, 2018). This review focuses on the student population aged 5 to 35 years. This population accommodates origins from all countries with both male and female genders. Studies with student populations that implement/used counselling career with artificial intelligence.

Exposure, Outcome and Inclusion Criteria

The use of exposure in the design of this study refers to (Pollock & Berge, 2018). The exposure is counselling career. This includes studies investigating counselling career (*Career Guidance and Public Policy*, 2004; Toni & Vuorinen, 2020; Vignesh et al., 2021)

The use of Outcomes in this research design refers to (Pollock & Berge, 2018). When thinking about what results to include in this review, it is important to keep in mind the notion of AI as a technology that makes computers and machines smart, "systems" that can accurately understand external data, learn from it, and apply that learning to meet specific goals and activities through flexible adaptation (A. Kaplan & Haenlein, 2019). AI is related to machines and computers that help humans solve problems and work more efficiently, regardless of definition. It is intelligence designed by humans and demonstrated by machines. AI is a man-made tool that mimics the "cognitive" skills of the human brain (Russell & Norvig, 2010). Studies that are not about artificial intelligence were not reviewed.

If these criteria were met, studies were entered: Must be in English; Must be a full paper; Must Student; counselling career indicators are required; artificial intelligence indicators are required; Must investigate counselling career with artificial intelligence.

Identification and Screening

The method of pearl harvesting involves the expansion of search phrases in order to identify a wide range of relevant research that can potentially serve as sources (Sandieson, 2006). This method picks several studies that match at least one of the search terms. Next, all keywords in each "pearl" were extracted and combined with alternative terms to generate a comprehensive list of search terms for each database (see Table 1). Use publish or perish applications to search for data. Scopus, Pubmed, Crossref, Google scholar, and publish or perish are examples of data sources.

The eligibility criteria help screen articles based on title and abstract. The full text is read aloud to clarify. Criteria for exclusion (Webster et al., 2021): Systematic reviews or meta-analyses and Book or book chapter

Table 1. Database Search Terms Alternatives

Screen	Population	Exposure	Outcome
Keyword alternatives	Student*	Counseling Career* OR Career*	AI* OR Artificial Intelligence* OR Artificial*

Data Extraction and Data Synthesis

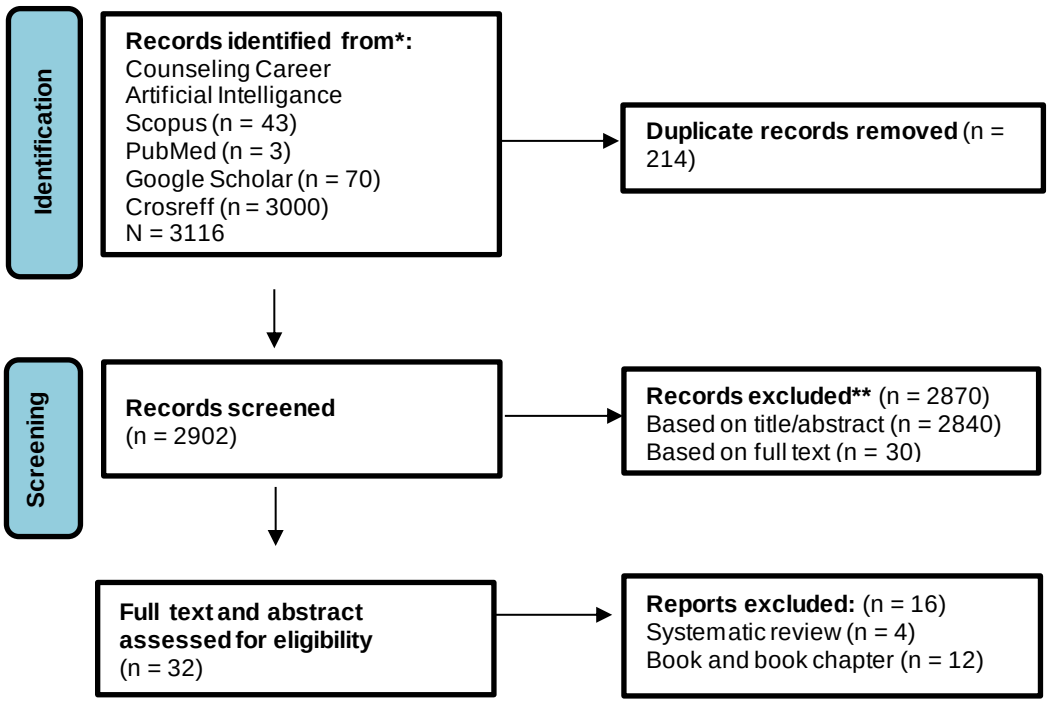
Each study's data included: Counseling career exposure was tested in this study. Exposure, population, and gender were also recorded. Each study was also summarised. Later studies were quantitative or qualitative (Webster et al., 2021). Synthesizing evidence is based on artificial intelligence. Learned artificial intelligence. Some studies synthesise more than one artificial intelligence outcome per outcome.

RESULT AND DISCUSSION

In July 2023, we discovered n=43 relevant articles in Scopus, n=3 in PubMed, n=70 in Google Scholar, and n=3000 in CrossRef (Figure 1. Study selection flowchart). After removing 214 duplicates, there remain 2902 publications that are suitable for play. According to the title and abstract of the screening, the population, the exposure/intervention, and the results, 2870 reports did not meet the requirements. The search was restricted to 32 pertinent articles.

17 studies were excluded after screening for eligibility. The review included 15 studies. A majority of quantitative studies, two qualitative studies, and one mixed-methods study are PRISMA's recommendations for Figure 1 (Liberati et al., 2009). The review's research questions-based studies are listed in table 1. This review's studies are listed in table 2. Artificial Intelligence and Counseling Career were examined in 15 studies. The Gorard Trust filter assessed 15 studies, consisting of a score of 4 (n = 12) and a score of 3 (n = 3).

Figure 1. Flowchart for study selection



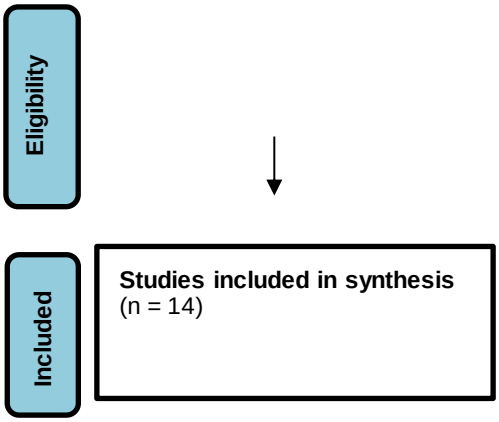


Table 2. Classification of reviewed studies.

Include Exposure: Counseling Career Include Outcome: Artificial Intelligence	N
(Guleria & Sood, 2023); (Suresh et al., 2021); (Zhang et al., 2022); (Zhang & Zheng, 2022); (Lee et al., 2018); (Westman et al., 2021b); (Joshi et al., 2020); (Hendahewa et al., 2006); (Liu, 2023); (Yan et al., 2019); (Carson et al., 1999); (Crowley, 1992); (José-García et al., 2022); (Nazareno et al., 2019)	14

The results of data collection found fourteen studies examining career counseling with artificial intelligence, namely: (Carson et al., 1999; Crowley, 1992; Guleria & Sood, 2023; Hendahewa et al., 2006; José-García et al., 2022; Joshi et al., 2020; Lee et al., 2018; Liu, 2023; Nazareno et al., 2019; Suresh et al., 2021; Westman et al., 2021b; Yan et al., 2019; Zhang et al., 2022; Zhang & Zheng, 2022). The years of publication of the manuscripts also varied, namely: 1992, 1999, 2006, 2018, 2019, 2020, 2021, 2022, and 2023. This study was conducted in Namibia, USA, UK, China, Romania, India, Sri Lanka, Philippines, South Korea, and Finland.

The results of data collection found ten studies examining System of Artificial Intelligence in Counseling Career, namely: (Carson et al., 1999; Crowley, 1992; Guleria & Sood, 2023; Hendahewa et al., 2006; José-García et al., 2022; Joshi et al., 2020; Lee et al., 2018; Liu, 2023; Nazareno et al., 2019; Suresh et al., 2021)

This study found ten studies that examined the purpose of using AI in career counseling (Carson et al., 1999; Guleria & Sood, 2023; Hendahewa et al., 2006; José-García et al., 2022; Joshi et al., 2020; Lee et al., 2018; Liu, 2023; Nazareno et al., 2019; Suresh et al., 2021; Zhang & Zheng, 2022).

The results of data collection found three studies examining the requirements for using AI in career counselling (Westman et al., 2021a; Yan et al., 2019; Zhang et al., 2022).

Table 3. The Characteristics of Studies Included In The Review

Author & Years	Population Country	Outcome Aartificial Intelligence (AI)	Exposure Career Counseling	Findings
(Guleria & Sood, 2023)	Students (n = 215) India	Aartificial Intelligence	Career counselling with machine learning	Artificial intelligence allows machines to learn from data. Predictive analytics employing white box and black box machine learning is offered. In addition, White and Black box

				model strategies are examined to explain and understand AI outcomes on a career counseling-based educational dataset. Predictions are based on machine learning algorithm accuracy. The career counseling framework uses the finest machine learning algorithm for decision-making.
(Suresh et al., 2021)	University students (n = 36) Namibia	Facebook Messenger using AI	Career counselling chatbot	The chatbot responds accurately and in real time to human input. In conclusion, the findings are expected to encourage system adoption, making it a beneficial tool for colleges and institutions who want to use it.
(Zhang et al., 2022)	Middle school students in STEM (n = 25) USA	Technical Learning to Promote AI Literacy	Integrating Ethics and Career Futures	Nearly half of students characterised AI as a technical subject with personal, career, and societal ramifications at the exit workshop.
(Zhang & Zheng, 2022)	College students China	Application and Analysis of Artificial Intelligence	Career Planning and Employment and Entrepreneurship Information Recommendation	Large-scale data such as college students' personal information, desired positions, and interest intents are merged and analysed using artificial intelligence technology and then offered to clients with matching needs and interests. This paper's research results: The user satisfaction score and MAE value of the model show that the information recommendation model for job and entrepreneurial information recommendation and career planning is feasible.
(Lee et al., 2018)	College students (n = 54) South Korea	Artificial Intelligence	Career Matching	This study introduces the Artificial Intelligence-based Design platform (AID) for university student-company job matchmaking. AID matches student skills and industry demands

				with zero miss-matching, while statistical approaches miss-match more than 30%. AID matches students to companies.
(Westman et al., 2021b)	Higher education students (n=179) and vocational Education students (n=103) Finland	Artificial Intelligence: Current Requirements and Prospects for the Future	Career Guidance	This paper discusses utilising AI to enhance career advising in higher education. Focus groups, scenario work, and practical trials map student, guidance staff, and institution needs and opportunities for career counselling with artificial intelligence. The findings suggest value, functions, drivers, and barriers for using AI in career advising to promote higher education and lifelong learning. The results suggest several kinds of agency and maturity levels for artificial intelligence in guidance procedures.
(Joshi et al., 2020)	Student India	Artificial Intelligence	Online Career Counsellor System	This system includes a chatbot and an intelligent engine that makes career recommendations based on data from industry leaders. AI technologies enable the system work reliably and efficiently. This career coaching approach will help everyone.
(Hendahewa et al., 2006)	Student undergraduates (n=30) Sri Lanka	Artificial Intelligence Approach	Effective Career Guidance	This paper discusses iAdvice, the Career Advisory Expert System, as a tool to help students choose a career and continue on target.
(Liu, 2023)	Students majoring in artificial intelligence (n=1732) China	Artificial Intelligence	Optimization and Model Construction of College Career Education	This paper proposes a new model and implementation path for "artificial intelligence + career education" in curriculum, learning, and environment by analysing the realistic demands of career education optimisation under artificial intelligence and the new characteristics of integration, innovation,

				and lifelong embodied in career education.
(Yan et al., 2019)	Art Doctoral Students China	Artificial Intelligence	Career Choice	Doctoral art students must address the following three issues in academic planning and professional development: First, we should objectively assess labour market needs, prepare for academic and non-academic jobs, and increase employment and vocational skills. Second, we must improve their multidisciplinary research and professional growth. Third, dynamically adapt academic planning content, improve career and academic planning coordination, and accomplish academic life and career development.
(Carson et al., 1999)	9-graders at public high schools in suburban Chicago (Sample A, N = 326) and urban Baltimore (Sample B, N = 29) United States of America	Artificial Neural Networks	Modeling Career Counselor Decisions	The results of this study make it clear that artificial neural networks have the potential to help vocational professionals to integrate many types of assessment data in making career recommendations (or, alternatively, selection and classification decisions).
(Crowley, 1992)	Student UK	Artificial System	Computer-Aided Careers Guidance	Not unexpectedly, most students (92%) agreed that the second version of the artificial programme had accurately described them: 'I was shocked it was so accurate.'It was more accurate than most questionnaires.
(José-García et al., 2022)	Students (n=64) studying at the University of Sheffield and the University of Exeter. UK	Artificial Intelligence in Education (AIED)	Career guidance	It's AI The approach could assist school and university career guiance keep up with the quickly changing employment market and manage the differences between IT and non-IT sectors.

(Nazareno et al., 2019)	Grade 11 students (n=293) from STEM (N1=157) and GAS (N2=136) were considered. The respondents are composed of 144 males and 149 females with an average age of about 17 years old. Philippines	Artificial Neural Network	Predicting Career Strand	The study is significant because it uses AI to predict an incoming Grade 11 student's career on target. We developed a 74.1% accurate predictive model to estimate an incoming senior high school student's strand.

System of Artificial Intelligence in Counseling Career

This study found several artificial intelligence systems used in career counseling. In 1992, research on computer-assisted artificial programs in career guidance showed high accuracy (n = 92%) (Crowley, 1992). In 1999, artificial intelligence was developed into an artificial neural network used in career counseling. Artificial neural networks have the potential to assist vocational professionals in integrating many types of assessment data when making career recommendations (Carson et al., 1999). iAdvice can be used as a career counselling expert system for all students (Hendahewa et al., 2006), Career guidance counsellors can use the iAdvice platform as a support mechanism for counseling. AID platforms can match students to companies, according to (Lee et al., 2018). The career matching evaluation with company goals shows no mismatches. The study (Nazareno et al., 2019) uses AI-based approaches to forecast the career paths of entering grade 11 pupils with 74.1% accuracy.

This online career counsellor system includes a chatbot and an intelligent engine that delivers the finest career choices based on industry-leading professional data and works precisely and efficiently with an AI application system. Career counselling seekers will benefit from this system (Joshi et al., 2020). According to (Suresh et al., 2021), chatbots interpret user input and give relevant, appropriate, reliable, and real-time responses. Chatbots can provide career counselling in places where dedicated career counsellors are scarce (Suresh et al., 2021). C3-IoC uses machine learning. It can supplement career counselling in schools and universities, assist counsellors keep up with the fastchanging employment market, and help counsellors negotiate the differences between IT and non-IT sectors (José-García et al., 2022).

According to the research paper (Guleria & Sood, 2023) machine learning is artificial intelligence that lets machines learn from data. Predictive analytics employing white-box and black-box machine learning is offered. To explain and comprehend AI outcomes on the career counseling-based educational data set, White and Black box modelling methodologies are analysed. Machine learning algorithms are compared to predict. The career counselling framework uses the best machine learning algorithms for decision-making (Guleria & Sood, 2023). Artificial intelligence technology integrates, analyses, and matches enormous amounts of data including students' personal information, desired roles, and interests to clients with similar needs and interests (Zhang & Zheng, 2022):

The assessment of students' skills through a career counseling-based system holds significant importance, as it enables recruiters to appropriately assign them suitable work responsibilities (Viheräkoski, 2020). The provision of career counselling services is crucial for addressing parental concerns regarding their children's future. Guidance centres are expected to assume a significant role in assisting parents in making informed decisions regarding their children's career paths. In this context, the application of Machine Learning will be employed to effectively execute computational intelligence activities in an intelligent manner (Yang et al., 2020). The aforementioned research conclusions are substantiated by multiple perspectives. According to (Crowley, 1992), computers started to play a role in education and career counselling in England around the late 1960s. Subsequently, there has been a significant increase in the quantity of systems. Currently, the majority of local education authorities utilise one of the primary systems. The categorization of programme reviews is commonly seen in the literature (Ballantine, 1980; Watts, 1986). The Educational Counselling and Credit Transfer System (ECCTIS) on Prestel is responsible for the retrieval and processing of information. For instance, CASCAID (Roberts & Witherspoon, 1978) and JIIG-CAL (Closs, 1986) are examples of career guidance systems that align users' interests and traits with certain occupations. Additionally, there are learning systems such as RESOLVE (COIC, 1985) and DECIDER (O'Leary, 1987) that assist users in developing their decision-making skills.

Goal of Using Artificial Intelligence in Career Counseling

The goal of using AI in career counseling is found in research: (Carson et al., 1999; Guleria & Sood, 2023; Hendahewa et al., 2006; José-García et al., 2022; Joshi et al., 2020; Lee et al., 2018; Liu, 2023; Nazareno et al., 2019; Suresh et al., 2021; Zhang & Zheng, 2022).

This study concludes that the purpose of using AI in career counseling is to make career recommendations (Carson et al., 1999), to use career guidance counselors as a support system in providing advice (Hendahewa et al., 2006), to design platforms based on artificial intelligence (AID) assigning the right student to the right company (career matching) (Lee et al., 2018), predicts a student's likely choice of career path with an accuracy of 74.1% (Nazareno et al., 2019), provides the best career choice on leading professional data in industry and career guidance (Joshi et al., 2020), offers career counseling (Suresh et al., 2021), a C3-IoC system that allows students to visualize and match to find the most suitable job role for a skill set, prepares students to workforce and useful for higher education career guidance services (José-García et al., 2022), carrying out proposed career predictions for effective decision-making (Guleria & Sood, 2023), information recommendations for employment and entrepreneurship information recommendations and career planning (Zhang & Zheng, 2022).

In (Liu, 2023) significant study, an examination is conducted on the practical requirements for optimising professional education within the context of artificial intelligence. This analysis takes into account the novel attributes of integration, innovation, and lifelong learning that are inherent in career education. The study by (Liu, 2023) introduces a fresh approach to the integration of "artificial intelligence + career education." This approach offers a new model and implementation strategy that encompasses curriculum design, learning methodologies, and environmental considerations.

According to (Liu, 2023), the bid for developing a career education model with an artificial intelligence base consists of three key components: the Curriculum Model, the Learning Model, and the Environment Model. The Curriculum Model is prioritised initially. The advent of artificial intelligence in the field of college career education offers the

opportunity to access courses and instructional materials tailored to individual preferences, hence facilitating the dissemination of up-to-date knowledge and content pertaining to contemporary professional education. The educational institution consistently expands its repertoire of classes, microclasses, and other online courses, reflecting the prevailing trend of online education. The study group has selected the teaching resource platform known as the stellar course, which exhibits a notable increase in the amount of instructional material compared to previous iterations. Students have the ability to engage in self-directed study of assigned content using online platforms, followed by the opportunity to demonstrate their acquired knowledge and experiences in virtual seminars. The concepts of "autonomy," "exploration," and "cooperation" among students have become increasingly suitable, with a heightened level of transparency in their subjectivity compared to previous times. Teachers are encouraged to actively acquire and master the requisite information and technology for online teaching, encompassing instructional presentation, assignment correction, and online tuition. This imperative aligns with the demands of the artificial intelligence era (Liu, 2023).

Furthermore, the integration of artificial intelligence and big data offers students an abundance of instructional resources and fosters a tailored learning environment. Alternative learning venues beyond traditional classrooms exist. The promotion of online learning spaces will be increasingly emphasised as smart cities and smart campuses continue to grow incrementally. According to (Liu, 2023), it is imperative for college career education to enhance the data gathering and analysis of the teaching process, along with the integration of high-caliber online resources inside the classroom setting.

Thirdly, the concept of a smart campus refers to an educational setting that integrates virtual and physical elements through the utilisation of advanced technology such as big data, cloud computing, and other related tools. The integration of career services, online instruction, career evaluation, and employment services with information technology is proposed as a means to establish a novel paradigm of digital and information-based career services. Additionally, the utilisation of big data and the analysis of student development curves can be employed to dynamically assess professional education and offer personalised career recommendations to students. Furthermore, the establishment of a career education intelligent management platform that facilitates interaction between teachers and students, as well as among students themselves, can provide precise and intelligent career planning and job guidance services (Liu, 2023).

The aforementioned research findings are substantiated by (Vignesh et al., 2021), who posited that the primary objective of career counselling revolves around self-awareness and comprehending one's own capabilities. According to (Strong, 1943), the prevailing types of systems are those that engage in information processing and develop employment prospects by considering an individual's interests, values, and educational objectives. The programme utilises a database comprising numerous job profiles to identify and choose the most suitable candidates.

Requirements for Using Artificial Intelligence in Career Counseling

The present study identifies the prerequisites for employing artificial intelligence (AI) in the domain of career counselling, as evidenced by the works of (Westman et al., 2021a; Yan et al., 2019; Zhang et al., 2022). The identified needs indicate that artificial intelligence is anticipated to provide assistance to students in the areas of academic and professional development, as well as in the realm of self-regulation. Students place significant emphasis on the crucial nature of readily available and punctual instruction, regardless of whether it

is provided by artificial intelligence or human beings. According to (Westman et al., 2021b), artificial intelligence (AI) has demonstrated its capability to identify subtle indicators and perhaps enhance guidance interventions in advance of individuals' awareness or action.

The next condition is that AI is a technical subject with personal, career, and social implications (Zhang et al., 2022).Unlike (José-García et al., 2022; Westman et al., 2021a), who look at the AI aspect, The report (Yan et al., 2019), looks at the requirements from the student's perspective. According to him, it is important to develop academic professional thinking and planning thinking and integrate self-reinforcing learning thinking from active learning, deep learning, and iterative learning in the era of AI.

Based on the aforementioned research findings and with reference to (Green, 2018) emphasis on ethical concerns related to artificial intelligence (AI), it is recommended that future studies concentrate on tactics to mitigate adverse consequences, address the issue of over-generalization, and explore potential risks associated with counselling services utilising AI. This implies that the utilisation of artificial intelligence in the field of career counselling necessitates adherence to certain criteria, namely that its application should yield beneficial outcomes and avoid any potential harm. The primary argument put up by (Green, 2018) is that the study should focus on assessing the level of expertise required by counsellors and clients in the field of AI technology and implementation. This is crucial in order to assure justice, compassion, and the absence of criminal activities in practise, as well as to safeguard the safety and well-being of both counsellors and clients.

Limit, Implications and Recommendation

Limitations: This paper reports an evaluation of empirical data examining career counseling with artificial intelligence. Our research is limited to the following topics: 1) Artificial intelligence systems in career counseling; 2) The purpose of using artificial intelligence in career counseling; and 3) the requirements for using artificial intelligence in career counseling. The review excluded sources not found in the literature. Publish or Perish limits our data sources to Scopus, PubMed, Google Scholar, and CrosReff.

Managerial implications: Several countries in the world and their schools and campuses have implemented career counseling with AI. So, in countries where the government does not yet have a policy on the use of AI in educational guidance and counseling, it is hoped that it will be able to make one soon. Thus, it can become a guideline for the implementation of career counseling with AI in schools and campuses.

The recommendation for future researchers is to examine the requirements for using AI in career counseling both in schools and on campuses. This is supported by the recent introduction of AI ethics Guidelines by the European Commission, which can serve as a basis for outlining common guidelines for developers and AI guidance staff (European Commission, 2021)

CONCLUSION

The conclusion of this study is to find fourteen empirical studies that examine career counseling with AI in three focuses: systems, objectives, and requirements for use. This research is proof that the research review data that focuses on the use of AI in career counseling is still small. Maybe you can examine the requirements for using AI in counseling using either qualitative, quantitative, mixed, or R&D research procedures. In my opinion, studying the requirements for using AI in career counseling is urgent. According to research findings, only a few countries have proposed policies to their governments regarding the use of AI in Education. AI is an instrument that can be utilized by the

government for mapping the work force, mapping jobs, and absorbing human resources. If this happens, students who are the output of education will not be left alone, confused, and with no career goals. So what is expected by the government? For example, the Indonesian government requires that graduates of good study programs have at least 6 months of (BAN-PT Regulation Number 5 Concerning Study Program Accreditation Instruments, 2019). Offer (Liu, 2023), it is very important and valuable to put forward a new model and implementation path of "artificial intelligence + career education" from the aspects of curriculum, learning, and environment. The contribution of this study is to provide an empirical description of career counseling with artificial intelligence from the aspects of systems, objectives, and requirements for using AI in career counseling. This empirical research evaluation data can then be used by policymakers (the government) to formulate the implementation of AI policies in education, especially educational guidance and counseling.

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