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RADemics

Entrepreneurship Development Using AI-Based Skill Mapping and Career Analytics

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Entrepreneurship Development Using AI-Based Skill Mapping and Career Analytics

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Abstract

Entrepreneurship development plays a crucial role in fostering innovation, economic competitiveness, and employment generation in modern knowledge-driven economies. Rapid digital transformation and evolving labor market conditions require individuals to possess diverse competencies that support opportunity recognition, creative problem solving, and venture creation. Traditional approaches to career guidance and skill assessment often rely on static evaluation methods that provide limited understanding of dynamic competency development and emerging entrepreneurial opportunities. Advances in artificial intelligence enable intelligent analysis of large volumes of educational, professional, and behavioral data to identify individual capabilities and align them with innovation-driven career pathways. AI-based skill mapping techniques support systematic identification and classification of technical competencies, cognitive abilities, and entrepreneurial attributes through computational analysis of academic records, digital learning activities, professional profiles, and online portfolios. Integration of machine learning algorithms, natural language processing, and predictive analytics enables automated extraction of competency information and the construction of dynamic skill profiles that reflect evolving professional capabilities. Career analytics further enhances this analytical framework by examining labor market trends, industry growth patterns, and startup ecosystem dynamics to identify promising entrepreneurial opportunities. Data-driven interpretation of competency patterns enables identification of skill gaps and supports the design of personalized learning pathways that strengthen entrepreneurial readiness. Intelligent analytical systems therefore contribute to the development of entrepreneurship support frameworks that guide individuals toward innovation-oriented professional trajectories. AI-enabled career intelligence platforms also assist educational institutions, innovation incubators, and policy organizations in identifying entrepreneurial talent and promoting sustainable innovation ecosystems. Integration of artificial intelligence with skill mapping and career analytics therefore offers a transformative approach for strengthening entrepreneurship development and aligning individual competencies with emerging opportunities within modern digital economies.

Keywords: Artificial Intelligence, Skill Mapping, Career Analytics, Entrepreneurship Development, Machine Learning, Workforce Intelligence.

Introduction

Entrepreneurship has become a fundamental component of economic transformation and innovation within contemporary knowledge-driven societies. Increasing global competition, rapid technological advancement, and digital transformation have reshaped the structure of industries and labor markets across the world. Modern economies depend heavily on individuals capable of identifying opportunities, developing creative solutions, and transforming innovative ideas into sustainable enterprises [1]. Entrepreneurship development therefore represents an essential strategy for promoting economic growth, technological advancement, and employment creation. Educational institutions, governments, and industry organizations have recognized the importance of cultivating entrepreneurial capabilities among individuals in order to strengthen national innovation ecosystems [2]. Entrepreneurial competence involves a combination of knowledge, skills, and behavioral attributes that enable individuals to navigate uncertain business environments and develop value-driven solutions. Such competencies include problem solving ability, critical thinking, leadership capacity, strategic planning, and the capacity to recognize emerging opportunities within dynamic markets. In many regions, entrepreneurship education programs have been introduced to encourage innovation and support the development of new ventures [3]. These programs emphasize experiential learning, innovation training, and collaboration with industry partners in order to prepare individuals for entrepreneurial careers. These initiatives, identifying individuals with strong entrepreneurial potential remains a significant challenge. Traditional training programs often adopt generalized approaches that overlook individual competencies and career aspirations [4]. As a result, numerous talented individuals remain underutilized within entrepreneurial ecosystems. The growing need for intelligent mechanisms capable of identifying entrepreneurial capabilities has stimulated interest in advanced technological approaches that support personalized skill identification and career development strategies [5].

Rapid development of digital technologies has significantly altered the structure of modern labor markets and professional pathways. Automation, artificial intelligence, and digital platforms have created new forms of economic activity while simultaneously transforming traditional employment structures [6]. Many professional roles increasingly require interdisciplinary competencies that combine technological expertise, creativity, and innovative thinking. Individuals entering modern workforce environments must therefore possess adaptable skill sets capable of responding to evolving industrial demands [7]. Entrepreneurship has emerged as an attractive career pathway that allows individuals to create new opportunities rather than relying solely on conventional employment models. Successful entrepreneurs demonstrate the capacity to integrate technical knowledge with innovative thinking in order to develop products, services, and solutions that address complex societal challenges [8]. Skill development therefore represents a critical factor in determining entrepreneurial success within competitive business environments. The ability to identify relevant competencies and align them with entrepreneurial opportunities becomes essential for enabling individuals to develop successful ventures. Conventional career guidance systems often rely on manual evaluations, aptitude tests, and self-reported assessments that offer limited insight into complex competency structures [9]. Such methods often fail to capture the diversity of technical and cognitive abilities required for entrepreneurial success. In addition, static evaluation systems struggle to reflect the dynamic evolution of skills as individuals acquire new knowledge and experiences. The emergence of data-driven analytical approaches

offers new possibilities for identifying competencies more accurately and supporting informed career decisions within rapidly evolving economic landscapes [10].