Contemporary Readings in Law and Social Justice

ISSN: 1948-9137, e-ISSN: 2162-2752

Vol 16 (1), 2024 pp. 1023 - 1035



# Factors of Employability Prediction: Conceptual Framework

# <sup>1</sup>hamza Nouib\*, <sup>2</sup>manal Benatiya Andaloussi, <sup>3</sup>aniss Moumen

<sup>1</sup>IBN TOFAIL UNIVERSITY, National School of Applied Sciences KENITRA, Morocco <u>hamza.nouib@uit.ac.ma</u>

<sup>2</sup>Manal BENATIYA ANDALOUSSI CHOUAIB DOUKKALI UNIVERSITY, FPSB, Morocco andaloussi.m@ucd.ac.ma

<sup>3</sup>IBN TOFAIL UNIVERSITY, National School of Applied Sciences KENITRA, Morocco aniss.oumoumen@uit.ac.ma

**Abstract:** The aim of this study is to explore employability prediction through a comprehensive analysis of relevant literature, focusing on key variables influencing perceived employability.

Drawing from 14 selected papers, we proceeded to an occurrence analysis through a textual content investigation. We identified and categorized five variables which are hard skills, social skills, demographic parameters, employment history, and applied job preferences. Our analysis reveals the prevalence and significance of certain sub-variables within each category, shedding light on their respective roles in predicting employability.

By synthesizing these findings, we proposed a conceptual framework elucidating the complex interplay between these variables, providing a roadmap for further empirical investigations and a basis for "employability prediction" measurement.

This research contributes to a deeper understanding of employability dynamics and informs both academic inquiry and practical interventions aimed at enhancing individuals' career prospects.

**Keywords:** Employability prediction, hard skills, social skills, conceptual framework, employment landscape, job position.

Received: 15 March 2024 Revised: 24 May 2024 Accepted: 14 June 2024

#### 1. Introduction

In the contemporary landscape of employment, the concept of employability has gained increasing prominence as organizations seek to adapt to evolving market dynamics and technological advancements.

Employability, defined as the capability of an individual to gain and maintain employment, has become a subject of considerable scholarly attention due to its implications for both individuals and organizations.

Against this backdrop, this study aims to delve into the factors influencing employability prediction, seeking to elucidate the multifaceted nature of this phenomenon and its underlying determinants.

The global labor market is witnessing significant transformations driven by factors such as automation, digitalization, and shifting skill requirements. These changes have necessitated a reevaluation of traditional notions of employability, emphasizing the importance of adaptability, continuous learning, and a diverse skill set. In this context, understanding the factors that contribute to employability prediction is crucial for guiding individuals, educational institutions, and policymakers in navigating the complexities of the modern workforce.

The primary objective of this research is to identify and analyze the factors that predict employability,

thereby contributing to a deeper understanding of the dynamics shaping individuals' career trajectories. By examining a wide range of variables and their interrelationships, this study seeks to develop a comprehensive framework for predicting employability outcomes in diverse contexts.

Central to this investigation is the question: What are the factors that predict employability for fresh graduates in the contemporary labor market?

By unpacking these factors and examining their relative importance according to the literature, this study aims to provide valuable insights into the determinants of employability and their implications for individuals and organizations. To do that, we will explain the methodology adopted, then we will expose the results and analysis then expose the conceptual framework adopted.

#### 2. Literature review

The concept of employability has garnered significant attention in the academic literature, reflecting its importance in understanding individuals' capacity to secure and maintain employment in dynamic labor markets (Clarke, 2008). Scholars have explored various dimensions of employability, including its definition, determinants, and measurement approaches, shedding light on the multifaceted nature of this construct (Deng et al., 2021; Di Fabio, 2017, 2017; Harvey, 2001; Peeters et al., 2019; Pitan & Atiku, 2017; Wittekind et al., 2010). A pivotal work by Vanhercke et al. provides a comprehensive framework for conceptualizing employability, distinguishing between internal factors (e.g., skills, attitudes) and external factors (e.g., labor market conditions, institutional support) (Vanhercke et al., 2014). This framework serves as a foundation for subsequent research into employability prediction.

Predicting employability has emerged as a central theme in contemporary research, with scholars endeavoring to identify the key factors influencing individuals' employability prospects. ElSharkawy et al. conducted a systematic review of employability prediction models, highlighting the importance of factors such as education, skills, and work experience in shaping employability outcomes (ElSharkawy et al., 2022). Their findings underscore the need for holistic approaches to employability assessment that consider both individual characteristics and contextual factors.

Educational attainment and skills acquisition have long been recognized as critical determinants of employability (Andrews & Higson, 2008). Studies by Islam and Mezhoudi et al. delve into the role of academic performance, IT skills, and relevant coursework in predicting employability, emphasizing the importance of aligning educational offerings with labor market demands (Islam, 2022; Mezhoudi et al., 2023).

Furthermore, socio-demographic factors exert a significant influence on employability, with gender, age, and socioeconomic status playing pivotal roles (Kannan et al., 2023). Research by Segbenya et al. and Kasler et al. explores the impact of demographic variables on employability prediction, highlighting disparities in access to employment opportunities and the need for targeted interventions to promote inclusivity (Kasler et al., 2017; Segbenya et al., 2023).

Employment history and job-related preferences also shape individuals' employability trajectories (Raman & Pramod, 2022). Studies by Thakar & Mehta and Saini et al. investigate factors such as previous work experience, job relevance, and career aspirations in predicting employability outcomes, underscoring the importance of aligning individual preferences with organizational requirements (Saini et al., 2021; Thakar & Mehta, 2017).

In addition to these factors, emerging trends such as digitalization, globalization, and automation are reshaping the employability landscape, necessitating a reevaluation of traditional predictors (Nyewusira, 2023). Future research should explore the implications of these trends for employability prediction and develop innovative approaches to assessing individuals' readiness for the future of work.

# 3. Method

A comprehensive literature search was conducted using the Scopus database on February 13, 2024,

employing the keyword "employability prediction". The search yielded a total of 32 documents. From these, 18 articles were selected based on their provision of empirical findings, while one book chapter and 13 conference papers were excluded due to concerns regarding reliability. To ensure accessibility and transparency, only articles available through open access were retained, resulting in a final set of 14 articles for content analysis (Figure 1).

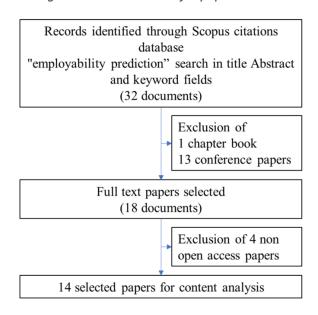


Figure 1 Prisma Protocol for paper selection

Source: the authors

The selected articles were meticulously reviewed to identify variables and sub-variables associated with the prediction of perceived employability. A total of 68 parameters impacting employability prediction were extracted from these articles. These parameters were subsequently grouped into five overarching variables based on thematic similarities: Hard Skills, Social Skills, Demographics, Employment History, and Applied Job.

Following the categorization of variables and sub-variables, a frequency analysis was performed to determine the prevalence of each sub-variable across the selected articles. This analysis provided insights into the relative importance of different parameters in predicting employability. Based on the occurrence analysis of sub-variables, a conceptual model outlining the interrelationships between the identified variables and their sub-variables was proposed.

The methodological approach adopted in this study involved a systematic review of relevant literature, followed by a meticulous categorization of variables and sub-variables associated with employability prediction. The subsequent frequency analysis facilitated the development of a comprehensive conceptual model, which serves as the foundation for further empirical investigations into the dynamics of perceived employability.

## 4. Findings

In order to identify the main variables and their sub-variables for measuring employability prediction, we based our analysis on the textual content of the 14 articles selected and identified the following variables and sub-variables per article. Table 1 below shows the analysis of the occurrence of each sub-variable.

Table 1" Employability prediction" impacting variables and sub-variables occurrence analysis

	(Casuat et al., 2020)	(Bhargava et al., 2021)	(Othman et al., 2018)	(Segbenya et al., 2023)	(Harari et al., 2021)	(Islam, 2022)	(Siivonen et al., 2023)	(Álvarez-González et al., 2017)	(Alheadary, 2023)	(Thakar & Mehta, 2017)	(López-Miguens et al., 2021)	(Mezhoudi et al., 2023)	(Römgens et al., 2020)	(Wittekind et al., 2010)	TOTAL OCCURRENCE
Hard skills															
Academic performance	1				1	1		1	1	1	1	1	1	1	10
IT skills				1		1	1	1	1	1	1	1		1	9
Degree			1	1		1			1			1		1	6
Critical thinking skills			1			1				1		1			4
Productivity		1				1									2
Analytical skills	1		1			1	1	1				1		1	7
Courses			1		1	1	1			1	1	1	1	1	9
Studentship			1			1						1			
Graduate studies			1	1	1	1	1	1	1	1		1		1	10
Expertise evolution	1								1		1		1		4
General knowledge			1		1	1	1	1					1		6
Graduation institution reputation						1		1		1					3
Graduation institution location										1	1				2
Hard skills relevance							1	1_						1	3
Social skills															
Communication skills	1	1	1			1				1	1	1	1		8
Psychometric aptitude					1			1		1		1			4
Creative skills			1	1		1							1	1	5
Leadership			1							1		1			3 7
Self esteem	1				1			1			1	1	1	1	7
General appearance	1				1							1			3 5
Socialization		1	1		1					1		1			
Alertness			1		1					1	1	1		1	6
Personality					1			1		1		1		1	5
Decision making		1	1							1		1			4
Time management												1	1		2 3
Stress management			1									1	1		3
Teamwork		1	1									1			3
Emotional stability					1			1					1		3
Proactivity					1						1			1	3
Adaptability					1	1		1						1	4
Self confidence											1		1		2
Self-efficacity											1		1		2
Ambition											1		1	1	3
Demographics parameters															
Marital status			1		1			1							3
Children					1										1
Gender			1	1	1	1	1	1		1	1	1			9
Parent education							1			1	1	1			4
Residence location			1							1		1			3
Parents income			1									1			2
Parents job										1					1
Transportation			1					1				1			3 3
Ethnicity			1							1		1			3
Age			1		1		1			1		1			5 2
Student loan			1									1			
Fitness activity			1												1
Political affiliation					_1_										1
Employment history															
Employment time					1							1			2
Industry			1									1			2
Previous experience					1	1						1		1	4
Reason of unemployment												1			1

Employment category	1				1					1		3
Position		1		1						1		3
Salary										1		1
Time to find work			1							1		2
Job relevance	1									1		2
Problem in job	1									1		2
Date of employment										1		1
Current status		1										1
Applied job Position												$\neg$
Job relevance	1			1		1	1	1	1	1	1	8
Expected salary										1		1
Expected sector							1	1	1	1		4
Location	1						1		1	1		4
Position	1			1		1	1	1	1	1		7
Networking				1		1	1		1			4
Work ethic				1					1	1		3
Entrepreneurship						1						1
University employment												
assistance							1		1			2
Promotion opportunity											1	1

Source: the authors

Based on the results of the occurrence analysis, several observations can be made regarding the frequency of sub-variables within each main variable category:

#### Hard skills:

The most frequently occurring sub-variables are academic Performance (10 occurrences), courses (9 occurrences), IT skills (9 occurrences), and graduate studies (10 occurrences), indicating their significance in predicting employability.

Other sub-variables such as degree (6 occurrences), analytical skills (7 occurrences), and general knowledge (6 occurrences) also demonstrate notable presence within the literature.

#### Social skills:

communication skills (8 occurrences) and self-esteem (7 occurrences) emerge as the most prevalent subvariables within the category of social skills, followed by alertness (6 occurrences) and psychometric aptitude (4 occurrences).

Additionally, attributes like creative skills (5 occurrences) and personality (5 occurrences) are also identified as recurrent themes in the literature.

#### Demographics parameters:

Among demographic parameters, gender (9 occurrences) is the most frequently discussed sub-variable, highlighting its perceived importance in employability prediction.

Other demographic factors such as age (5 occurrences) and parent education (4 occurrences) also receive considerable attention, suggesting their potential influence on perceived employability.

#### • Employment history:

Sub-variables within the employment history category show relatively lower frequencies, with previous experience (4 occurrences) being the most prevalent, followed by employment category (3 occurrences) and position (3 occurrences).

## • Applied job Position:

Within the Applied job Position category, job relevance (8 occurrences) stands out as the most frequently mentioned sub-variable, underscoring its critical role in predicting employability.

Other sub-variables like position (7 occurrences) and networking (4 occurrences) also demonstrate significant presence in the literature.

# 5. Results Analysis and discussion

The findings provide valuable insights into the relative importance attributed to different variables and sub- variables in the prediction of employability. Further analysis and synthesis of the results will contribute to the development of a comprehensive conceptual framework for understanding employability dynamics and prediction. In the following we will discuss the five main variables and the sub-variables of each variable.

#### 5.1 Hard Skills

Hard skills are tangible, technical abilities that are typically acquired through education, training, or experience. They are directly related to job performance and are often quantifiable. From the occurrence analysis, we observe that hard skills such as academic performance, IT skills, and degree attainment are frequently discussed in the literature, highlighting their importance in predicting employability

(ElSharkawy et al., 2022; Mezhoudi et al., 2023; Raman & Pramod, 2022). These skills provide a foundation for individuals to perform specific tasks and duties within their chosen fields. Employers often seek candidates with a strong foundation in hard skills relevant to the job role, as they are essential for meeting job requirements and achieving organizational objectives.

Therefore, we expect that "Hard skills" would be able to predetermine "employability prediction" (H1).

The table 2 bellow provide a decomposition of "Hard skills" variable based on the occurrence analysis of its sub variables identified from the literature content analysis.

Table 2 "Hard skills" sub-variables

variable	Sub-variable		Hypothesis
	Academic performance	Academic achievements and performance metrics can directly influence perceived employability.	H1.1
	IT skills	Proficiency in Information Technology enhances employability by facilitating adaptation to technological advancements in the workplace.	H1.2
	Degree	Attainment of a degree serves as a foundational credential for entering the job market and securing employment opportunities.	H1.3
	Critical thinking skills	Ability to analyze, evaluate, and solve complex problems is essential for success in diverse professional contexts.	H1.4
	Productivity	Demonstrated ability to efficiently accomplish tasks and meet objectives contributes to perceived employability.	H1.5
	Analytical skills	Capacity to gather, interpret, and synthesize information enhances decision-making capabilities in employment settings.	H1.6
ills	Courses	Completion of relevant courses and training programs enhances skill acquisition and employability prospects.	H1.7
Hard Skills	Studentship	Engagement in extracurricular activities and student initiatives fosters personal and professional development, enhancing employability.	H1.8
На	Graduate studies	Pursuit of advanced degrees or postgraduate education signals commitment to continuous learning and professional advancement.	H1.9
	Expertise evolution	Continual development and enhancement of specialized knowledge and skills bolster employability in dynamic job markets.	H1.10
	General knowledge	Broad understanding of diverse subjects and domains enriches problem-solving abilities and enhances employability.	H1.11
	Graduation institution reputation	Reputation and prestige of educational institutions influence perceptions of candidate competence and employability.	H1.12
	Graduation institution location	Geographic location and accessibility of educational institutions may impact employability opportunities.	H1.13
	Hard skills relevance	Alignment of acquired hard skills with job requirements and industry demands enhances employability outcomes.	H1.14

Source: the authors

#### 5.2 Social Skills

Social skills refer to the interpersonal abilities and emotional intelligence that enable individuals to interact effectively with others in various social and professional contexts. They encompass communication skills, leadership, teamwork, and emotional stability, among others. Social skills are crucial for building relationships, resolving conflicts, and collaborating with colleagues in the workplace (Alieva & Powell, 2023; Andrews & Higson, 2008; Chakraborty et al., 2017; Garcez et al., 2022; Kannan et al., 2023; Mezhoudi et al., 2023; Rodriguez Martinez et al., 2021). The occurrence analysis reveals that communication skills, self-esteem, and personality traits are among the most frequently discussed sub- variables within this category. Employers value candidates who possess strong social skills, as they contribute to a positive work environment, effective teamwork, and enhanced productivity.

Therefore, we expect that "Social skills" would be able to predetermine "employability prediction" (H2).

The table 3 bellow provide a decomposition of "Social skills" variable based on the occurrence analysis of its sub variables identified from the literature content analysis.

Table 3 "Social skills" sub-variables

/ariable	Sub-variable		Hypothesi
	Communication skills	Effective verbal and written communication abilities are crucial for building professional relationships and securing employment.	H2.1
	Psychometric aptitude	Psychological assessments of cognitive abilities and personality traits provide insights into candidate suitability for specific roles.	H2.2
	Creative skills	Innovative thinking and problem-solving abilities contribute to adaptability and competitiveness in the job market.	H2.3
	Leadership	Capacity to inspire, motivate, and guide others fosters leadership potential and enhances employability.	H2.4
	Self-esteem	Confidence in one's abilities and self-worth positively influences interpersonal interactions and perceived employability.	H2.5
	General appearance	Personal grooming and presentation impact initial impressions and perceptions of candidate suitability for employment.	H2.6
	Socialization	Ability to interact effectively in social settings and collaborate with diverse individuals enhances teamwork skills and employability.	H2.7
	Alertness	Vigilance and attentiveness to situational cues and opportunities enhance adaptability and employability.	H2.8
	Personality	Individual traits and disposition influence interpersonal dynamics and perceived fit within organizational cultures.	H2.9
Social Shills	Decision making	Sound judgment and decision-making abilities are essential for navigating complex work environments and achieving desired outcomes.	H2.10
5	Time management	Efficient allocation of time and resources maximizes productivity and enhances employability.	H2.11
	Stress management	Adaptive coping strategies and resilience mitigate stressors and support sustained performance in employment contexts.	H2.12
	Teamwork	Collaboration and cooperation with colleagues contribute to collective goal attainment and organizational success.	H2.13
	Emotional stability	Emotional resilience and stability facilitate effective stress management and decision making, enhancing employability.	H2.14
	Proactivity	Anticipation of challenges and proactive problem-solving enhance adaptability and competitiveness in the job market.	H2.15
	Adaptability	Flexibility and openness to change facilitate adjustment to evolving job requirements and industry dynamics, enhancing employability.	H2.16
	Self-confidence	Belief in one's abilities and capacity to succeed fosters initiative and self- assurance, enhancing employability.	H2.17
	Self-efficacy	Confidence in one's capacity to perform specific tasks and achieve desired outcomes enhances motivation and employability.	H2.18
	Ambition	Aspiration for personal and professional growth drives initiative and pursuit of opportunities, enhancing employability.	H2.19

Source: the authors

## 5.3 Demographics parameters:

Demographic variables encompass personal characteristics such as age, gender, education, ethnicity, and socioeconomic status. These factors can influence an individual's access to opportunities, resources, and support networks, thereby shaping their employability prospects (Kannan et al., 2023; Kasler et al., 2017; Mezhoudi et al., 2023; Segbenya et al., 2023). From the occurrence analysis, we observe that gender, age, and parental education are among the most frequently discussed demographic variables in the literature.

Employers may consider demographic factors when making hiring decisions or designing diversity and inclusion initiatives. It is essential to recognize the potential impact of demographic variables on employability outcomes and address any disparities through targeted interventions and policies.

Therefore, we expect that "Demographics parameters" would be able to predetermine "employability prediction" (H3).

The table 4 bellow provide a decomposition of "Demographics parameters" variable based on the occurrence analysis of its sub variables identified from the literature content analysis.

Table 4 "Demographics parameters" sub-variables

Variable	Sub-variable		Hypothesis
	Marital status	Marital status may impact lifestyle preferences and career decisions, influencing employability opportunities.	H3.1
	Children	Responsibilities associated with childcare and family obligations may affect career trajectories and employability prospects.	H3.2
	Gender	Gender dynamics and biases may influence access to opportunities and perceptions of candidate competence and employability.	H3.3
	Parent education	Educational attainment of parents may influence access to resources and support networks, shaping employability outcomes.	H3.4
	Residence location	Geographic location and accessibility of amenities and employment opportunities may impact career choices and employability.	H3.5
Demographics parameters	Parents income	Socio-economic status and financial resources influence access to education and training opportunities, impacting employability.	H3.6
	Parents job	Parental occupation and professional networks may provide insights or opportunities for career advancement, influencing employability.	H3.7
Ograp P	Transportation	Accessibility and availability of transportation options may affect mobility and access to employment opportunities, impacting employability.	H3.8
	Ethnicity	Ethnic background and cultural factors may influence perceptions of candidate suitability and employability in diverse contexts.	H3.9
	Age	Age demographics may impact career stage, experience level, and perceptions of candidate suitability, influencing employability opportunities.	H3.10
	Student loan	Financial obligations associated with student loans may impact career decisions and job search strategies, affecting employability.	H3.11
	Fitness activity	Engagement in physical fitness activities may enhance well-being and resilience, positively impacting employability outcomes.	H3.12
	Political affiliation	Political affiliations and ideologies may influence access to networks and opportunities, impacting employability prospects.	H3.13

Source: the authors

#### **5.4** Employment History:

Employment history refers to an individual's past experiences, including previous jobs, industry involvement, job transitions, and reasons for unemployment. It provides insights into a candidate's professional background, skills, and accomplishments (Cohn et al., 2016; Kannan et al., 2023; Mezhoudi et al., 2023; Raman & Pramod, 2022). The occurrence analysis highlights that previous experience and job relevance are among the most frequently discussed sub-variables within this category. Employers often consider an applicant's employment history when assessing their suitability for a position and predicting their future performance. Candidates with a demonstrated track record of success and relevant experience

are typically viewed as more competitive and desirable in the job market.

Therefore, we expect that "Employment history parameters" would be able to predetermine "employability prediction" (H4).

The table 5 bellow provide a decomposition of "Employment history parameters" variable based on the occurrence analysis of its sub variables identified from the literature content analysis.

Table 5 "Employment history parameters" sub-variables

Variable	Sub-variable		Hypothesis
	Employment time	Duration of previous employment experiences provides insights into candidate stability and reliability, influencing employability perceptions.	H4.1
	Industry	Sector-specific knowledge and experience impact job relevance and suitability, shaping employability opportunities.	H4.2
	Previous experience	Accumulated work experience and skill acquisition enhance candidate competence and employability prospects.	H4.3
ters	Reason of unemployment	Explanations for gaps in employment history may influence perceptions of candidate reliability and employability.	H4.4
Employment history parameters	Employment category	Classification of previous roles and positions provides insights into candidate skills and competencies, influencing employability.	H4.5
tory p	Position	Job titles and responsibilities reflect level of seniority and expertise, impacting perceptions of candidate suitability and employability.	H4.6
nt his	Salary	Compensation levels and salary history may reflect market value and perceived worth, influencing employability negotiations.	H4.7
loyme	Time to find work	Duration of job search efforts may reflect market conditions and candidate competitiveness, impacting employability.	H4.8
Emp	Job relevance	Alignment of previous roles and experiences with job requirements enhances perceived suitability and employability.	H4.9
	Problem in job	Challenges encountered in previous roles provide insights into candidate adaptability and resilience, influencing employability perceptions.	H4.10
	Date of employment	Timeliness of employment transitions may reflect candidate initiative and readiness, impacting employability assessments.	H4.11
	Current status	Present employment situation provides insights into candidate career trajectory and stability, influencing employability perceptions.	H4.12

Source: the authors

#### 5.5 Applied job Position:

The Applied job Position variable pertains to factors related to specific job opportunities that individuals are seeking or applying for. This includes job relevance, expected salary, location preferences, and networking opportunities (Celine et al., 2020; Mezhoudi et al., 2023; Okay-Somerville & Scholarios, 2017; Saidani et al., 2022; Saini et al., 2021). The occurrence analysis indicates that job relevance and position preferences are among the most frequently discussed sub-variables within this category. Candidates' preferences and priorities regarding job characteristics and opportunities may vary based on their career goals, personal circumstances, and aspirations. Employers strive to align job offerings with candidate expectations and preferences to attract top talent and enhance recruitment outcomes.

Therefore, we expect that "Employment history parameters" would be able to predetermine "Applied job Position" (H5).

The table 6 bellow provide a decomposition of "Applied job Position" variable based on the occurrence analysis of its sub variables identified from the literature content analysis.

Table 6 "Applied job Position" sub-variables

Variable	Sub-variable		Hypothesis
	Job relevance	Alignment of job requirements with candidate skills and experiences enhances perceived suitability and employability.	H5.1
	Expected salary	Salary expectations reflect candidate value proposition and market expectations, influencing employability negotiations.	H5.2
	Expected sector	Industry preferences and career aspirations influence job search strategies and employability prospects.	H5.3
uo	Location	Geographic preferences and mobility considerations impact job search decisions and employability opportunities.	H5.4
Applied job Position	Position	Desired roles and responsibilities reflect career goals and aspirations, impacting employability prospects.	H5.5
ed job	Networking	Building and leveraging professional networks enhance access to opportunities and employability prospects.	H5.6
Appli	Work ethic	Demonstrated commitment to professional integrity and diligence enhances perceived reliability and employability.	H5.7
	Entrepreneurs hip	Aspiration for entrepreneurship and innovation influences career choices and employability trajectories.	H5.8
	University employment assistance	Utilization of university resources and career services enhances job search effectiveness and employability outcomes.	H5.9
	Promotion opportunity	Potential for career advancement and growth opportunities impacts job satisfaction and long-term employability.	H5.10

Source: the authors

In summary, the analysis of these five variables provides valuable insights into the multifaceted nature of employability prediction, encompassing a diverse range of factors that influence individuals' ability to secure and maintain employment opportunities. By understanding and addressing these variables, stakeholders can enhance employability outcomes and support individuals in achieving their career aspirations.

Hard Skills Demographics parameters Marital status Children Gender H1.1 H1.2 H1.3 H1.4 H1.5 H1.6 H1.7 H1.8 H1.9 H1.10 H1.11 H1.12 H1.13 H1**H3** Degree Critical thinking skills Productivity Analytical skills Analytical skills
Courses
Studentship
Graduate studies
Expertise evolution
General knowledge
Graduation institution reputation
Graduation institution location
Hard skills relevance Employment history Social skills Employment time Industry Previous experience Reason of unemployme Employment category Position Salary Time to find work Job relevance Problem in job Date of employment Current status H4 Communication skills Psychometric aptitude Creative skills Leadership Self-esteem employability prediction H5 otional stability Applied job position

Figure 2 Conceptual Framework for measuring "employability prediction"

Source: The authors

#### 6. Conclusion

The analysis of variables and sub-variables associated with employability prediction provides valuable insights into the multifaceted nature of this construct. Based on the literature review and occurrence analysis, we proposed a conceptual framework mobilizing five main variables ("Hard skills", "Social skills", "demographic parameters", "employment history" and "applied job position") to facilitate the understanding of employability dynamics and the measurement of "employability prediction".

This comprehensive examination highlights the critical role of both hard and soft skills, alongside demographic factors and employment history, in shaping perceptions of employability. The proposed conceptual framework offers a structured approach to navigate the complexity of employability dynamics, providing valuable insights for academia and practitioners alike.

Academic institutions can leverage these findings to adapt educational curricula and better prepare students for the job market, while employers can refine their hiring processes to identify candidates who possess the most relevant skills and attributes.

Moving forward, further research is warranted to validate and refine the conceptual model, ensuring its applicability across diverse contexts and demographic groups. Despite potential limitations, limiting content analysis to 14 papers, this framework serves as a valuable tool for advancing our understanding of employability prediction and supporting individuals in achieving successful and fulfilling careers. Furthermore, contextualizing the study within specific industries or regions could further refine the model, acknowledging the unique challenges and opportunities faced by different populations. Additionally, incorporating machine learning techniques offers a promising perspective for enhancing the accuracy and predictive power of the model, enabling more sophisticated analyses of employability factors and their interrelationships.

## References

- [1] Alheadary, W. G. (2023). Controlling Employability Issues of Computing Graduates through Machine Learning-Based Detection and Identification. Engineering, Technology & Applied Science Research, 13(3), 10888-10894.
- [2] Alieva, J., & Powell, D. J. (2023). The significance of employee behaviours and soft management practices to avoid digital waste during a digital transformation. International Journal of Lean Six Sigma, 14(1), 1-32. Scopus. <a href="https://doi.org/10.1108/IJLSS-07-2021-0127">https://doi.org/10.1108/IJLSS-07-2021-0127</a>
- [3] Álvarez-González, P., López-Miguens, M. J., & Caballero, G. (2017). Perceived employability in university students: Developing an integrated model. Career Development International, 22(3), 280-299.
- [4] Andrews, J., & Higson, H. (2008). Graduate Employability, 'Soft Skills' Versus 'Hard' Business Knowledge: A European Study. Higher Education in Europe, 33(4), 411-422. https://doi.org/10.1080/03797720802522627
- [5] Bhargava, A., Bester, M., & Bolton, L. (2021). Employees' Perceptions of the Implementation of Robotics, Artificial Intelligence, and Automation (RAIA) on Job Satisfaction, Job Security, and Employability. Journal of Technology in Behavioral Science, 6(1), 106-113. https://doi.org/10.1007/s41347-020-00153-8
- [6] Casuat, C. D., Castro, J. C., Evangelista, D. C. P., Merencilla, N. E., & Atal, C. P. (2020). StEPS: A Development of Students' Employability Prediction System using Logistic Regression Model Based on Principal Component Analysis. 2020 IEEE 10th International Conference on System Engineering and Technology (ICSET), 17-21. <a href="https://doi.org/10.1109/ICSET51301.2020.9265371">https://doi.org/10.1109/ICSET51301.2020.9265371</a>
- [7] Celine, S., Dominic, M. M., & Devi, M. S. (2020). Logistic regression for employability prediction. International Journal of Innovative Technology and Exploring Engineering, 9(3), 2471-2478.

- [8] Chakraborty, T., Gupta, D., & Saha, R. (2017). Role of psychological predisposition on employability of management students: Moderation analysis through soft skills training. Int. J. Indian Psychol, 4, 101-122.
- [9] Clarke, M. (2008). Understanding and managing employability in changing career contexts. Journal of European Industrial Training, 32(4), 258-284. <a href="https://doi.org/10.1108/03090590810871379">https://doi.org/10.1108/03090590810871379</a>
- [10] Cohn, A., Maréchal, M. A., Schneider, F., & Weber, R. A. (2016). Job history, work attitude, and employability. Working Paper. <a href="https://www.econstor.eu/handle/10419/162417">https://www.econstor.eu/handle/10419/162417</a>
- [11] Deng, J., Liu, J., Deng, W., Yang, T., & Duan, Z. (2021). Redefinition and measurement dimensions of sustainable employability based on the swAge-model. International Journal of Environmental Research and Public Health, 18(24), 13230.
- [12] Di Fabio, A. (2017). A Review of Empirical Studies on Employability and Measures of Employability. In K. Maree (Éd.), Psychology of Career Adaptability, Employability and Resilience (p. 107-123). Springer International Publishing. <a href="https://doi.org/10.1007/978-3-319-66954-07">https://doi.org/10.1007/978-3-319-66954-07</a>
- [13] ElSharkawy, G., Helmy, Y., & Yehia, E. (2022). Employability Prediction of Information Technology Graduates using Machine Learning Algorithms. International Journal of Advanced Computer Science and Applications, 13(10), 359-367. Scopus. <a href="https://doi.org/10.14569/IJACSA.2022.0131043">https://doi.org/10.14569/IJACSA.2022.0131043</a>
- [14] Garcez, A., Franco, M., & Silva, R. (2022). The soft skills bases in digital academic entrepreneurship in relation to digital transformation. Innovation and Management Review. Scopus. https://doi.org/10.1108/INMR-07-2021-0135
- [15] Harari, M. B., McCombs, K., & Wiernik, B. M. (2021). Movement capital, RAW model, or circumstances? A meta-analysis of perceived employability predictors. Journal of Vocational Behavior, 131, 103657.
- [16] Harvey, L. (2001). Defining and Measuring Employability. Quality in Higher Education, 7(2), 97-109. <a href="https://doi.org/10.1080/13538320120059990">https://doi.org/10.1080/13538320120059990</a>
- [17] Islam, M. A. (2022). Industry 4.0 : Skill set for employability. Social Sciences & Humanities Open, 6(1), 100280.
- [18] Kannan, R., Jet, C. C., Ramakrishnan, K., & Ramdass, S. (2023). Predicting Student's Soft Skills Based on Socio-Economical Factors: An Educational Data Mining Approach. JOIV: International Journal on Informatics Visualization, 7(3-2), 2040-2047.
- [19] Kasler, J., Zysberg, L., & Harel, N. (2017). Hopes for the future: Demographic and personal resources associated with self-perceived employability and actual employment among senior year students. Journal of Education and Work, 30(8), 881-892. https://doi.org/10.1080/13639080.2017.1352083
- [20] López-Miguens, M. J., Caballero, G., & Álvarez-González, P. (2021). Responsibility of the University in Employability: Development and validation of a measurement scale across five studies. Business Ethics, the Environment & Responsibility, 30(1), 143-156. <a href="https://doi.org/10.1111/beer.12319">https://doi.org/10.1111/beer.12319</a>
- [21] Mezhoudi, N., Alghamdi, R., Aljunaid, R., Krichna, G., & Düştegör, D. (2023). Employability prediction: A survey of current approaches, research challenges and applications. Journal of Ambient Intelligence and Humanized Computing, 14(3), 1489-1505. Scopus. <a href="https://doi.org/10.1007/s12652-021-03276-9">https://doi.org/10.1007/s12652-021-03276-9</a>
- [22] Nyewusira, B. (2023). RESHAPING HIGHER EDUCATION FOR EMPLOYABILITY: A COMPARATIVE ANALYSIS OF CHINA AND NIGERIA'S STRATEGIES. Interdisciplinary Journal of Educational Practice (IJEP), 10(3), 41-50.
- [23] Okay-Somerville, B., & Scholarios, D. (2017). Position, possession or process? Understanding objective and subjective employability during university-to-work transitions. Studies in Higher

- Education, 42(7), 1275-1291. https://doi.org/10.1080/03075079.2015.1091813
- [24] Othman, Z., Shan, S. W., Yusoff, I., & Kee, C. P. (2018). Classification techniques for predicting graduate employability. International Journal on Advanced Science, Engineering and Information Technology, 8(4-2), 1712-1720.
- [25] Peeters, E., Nelissen, J., De Cuyper, N., Forrier, A., Verbruggen, M., & De Witte, H. (2019). Employability Capital: A Conceptual Framework Tested Through Expert Analysis. Journal of Career Development, 46(2), 79-93. https://doi.org/10.1177/0894845317731865
- [26] Pitan, O. S., & Atiku, S. O. (2017). Structural determinants of students' employability: Influence of career guidance activities. South African Journal of Education, 37(4). <a href="https://www.ajol.info/index.php/saje/article/view/164245">https://www.ajol.info/index.php/saje/article/view/164245</a>
- [27] Raman, R., & Pramod, D. (2022). The role of predictive analytics to explain the employability of management graduates. Benchmarking: An International Journal, 29(8), 2378-2396.
- [28] Rodriguez Martinez, A., Sánchez, V. S., Falcon Linares, C., & Latorre Cosculluela, C. (2021). Key soft skills in the orientation process and level of employability. Sustainability, 13(6), 3554.
- [29] Römgens, I., Scoupe, R., & Beausaert, S. (2020). Unraveling the concept of employability, bringing together research on employability in higher education and the workplace. Studies in Higher Education, 45(12), 2588-2603. https://doi.org/10.1080/03075079.2019.1623770
- [30] Saidani, O., Menzli, L. J., Ksibi, A., Alturki, N., & Alluhaidan, A. S. (2022). Predicting Student Employability Through the Internship Context Using Gradient Boosting Models. IEEE Access, 10, 46472-46489. Scopus. <a href="https://doi.org/10.1109/ACCESS.2022.3170421">https://doi.org/10.1109/ACCESS.2022.3170421</a>
- [31] Saini, B., Mahajan, G., & Sharma, H. (2021). An analytical approach to predict employability status of students. IOP conference series: materials science and engineering, 1099(1), 012007. https://iopscience.iop.org/article/10.1088/1757-899X/1099/1/012007/meta
- [32] Segbenya, M., Oppong, N. Y., Nyarko, E. A., & Baafi-Frimpong, S. A. (2023). Demographic characteristics and employability skills among tertiary graduates in Ghana: Evidence from the National Service Scheme. Cogent Economics & Finance, 11(2), 2225915. <a href="https://doi.org/10.1080/23322039.2023.2225915">https://doi.org/10.1080/23322039.2023.2225915</a>
- [33] Siivonen, P., Isopahkala-Bouret, U., Tomlinson, M., Korhonen, M., & Haltia, N. (2023). Introduction : Rethinking Graduate Employability in Context. In P. Siivonen, U. Isopahkala-Bouret, M. Tomlinson, M. Korhonen, & N. Haltia (Éds.), Rethinking Graduate Employability in Context (p. 1-26). Springer International Publishing. <a href="https://doi.org/10.1007/978-3-031-20653-5">https://doi.org/10.1007/978-3-031-20653-5</a> 1
- [34] Thakar, P., & Mehta, A. (2017). A unified model of clustering and classification to improve students' employability prediction. International Journal of Intelligent Systems and Applications, 9(9), 10-18. Scopus. <a href="https://doi.org/10.5815/ijisa.2017.09.02">https://doi.org/10.5815/ijisa.2017.09.02</a>
- [35] Vanhercke, D., De Cuyper, N., Peeters, E., & De Witte, H. (2014). Defining perceived employability: A psychological approach. Personnel Review, 43(4), 592-605.
- [36] Wittekind, A., Raeder, S., & Grote, G. (2010). A longitudinal study of determinants of perceived employability. Journal of Organizational Behavior, 31(4), 566-586. https://doi.org/10.1002/job.646