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# Factors affecting engineering students' self-perceived employability in Morocco

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**ABSTRACT**

In a dynamic socio-economic world, perceiving a career opportunity and job prospects has become complex. The number of unemployed individuals is rising despite the increasing number of students pursuing higher education. This study is suggested to enhance students' professional insertion, guide their career development initiatives, and help them acquire the skills demanded by prospective employers, thereby increasing their likelihood of employment. For this goal, this study investigates the determinants impacting self-perceived employability (SPE) among engineering students. Following a quantitative approach to explain how personal and contextual factors impact perceived employability, more than 350 Moroccan engineering students responded to a questionnaire for data collection, which had an internal consistency of 0.90. Data analysis employing advanced statistical techniques using structural equations modeling (SEM) to conduct descriptive, regression, and mediation analysis. The findings highlight that academic performance, university contribution, and personal circumstances significantly influence perceived employability, while generic skills have a minor effect. Furthermore, personal determinants are identified as stronger than contextual ones. The results provide several recommendations to stakeholders such as university administrations, teaching staff, employers, the Ministry of Education, and graduates. Additionally, they offer an insightful exploration of the intricate interactions among factors that enhance employability.



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## 1. INTRODUCTION

Employability is the most considerable indicator for assessing a country's social cohesion level [1]. Graduates must take multiple competitions and interviews yearly to ensure their employability, yet their professional insertion remains very difficult. Research in this field is getting significant attention due to the employment situation worldwide, especially in Morocco [2]. Since the turn of the century, employability has been a must for the mission of universities and public policies [3]. Certainly, the concept was present in the

literature for even earlier years. However, the interest increased exponentially because of the fast-changing job requirements and employment policy. Accordingly, research studies have focused on multiple academic disciplines, such as human resource management, education, economy, and careers. Römgens *et al.* [3] to investigate this concept, thus developing many models and scales determining it. However, there is less work on perceptions of employability, especially among engineering students. Youth unemployment and underemployment are global concerns. According to the 2023 report "activity, employment, and unemployment" published by the Moroccan High Commission for Planning (HCP), the country's unemployment rate is 13%. Furthermore, the report highlights a major concern among higher education graduates, who have an unemployment rate of 19.7%. This high rate presents a significant socioeconomic challenge for the country, indicating a potential mismatch between the skills graduates acquire and those demanded by the labor market, a loss of potential human capital and productivity, hindering economic growth, increased risk of social dissatisfaction, and instability. This research suggests a considerable challenge in addressing this issue to ease the professional insertion of students into the labor market [4].

The focus on employability itself does not find a solution for the students seeking jobs [5]; it is insufficient due to the gap between the received education and the labor market qualifications [6]. However, it allows them to gain the needed skills to meet job-related demands [7]. Rothwell *et al.* [4] defined these skills as the personal determinants of perceived employability, such as professional experience, academic performance, skills, capital, and individual knowledge. According to Álvarez-González *et al.* [6], there are also contextual determinants, including the reputation of the university and the impact of professors. Fugate *et al.* [7] affirmed that employability is a socio-psychological foundation of several dimensions like career identity, personal adaptability, and social and human capital [8]. Still, most research on factors of employability perception is theoretical [9], and scales to analyze in this field are limited and restricted [10]. Given that the improvement of students' perception of employability has a direct impact on driving the social and economic growth of our country, Brown and Lent [10] posited that multiple variables can build up a successful career based on the social cognitive career theory, according to their theoretical framework's outcome expectations, self-efficacy and personal goals interact with external variables like environment to improve the career development. Personal goals are the most significant and solid compared to the others because they determine how individuals lead their efforts and guide their career behavior, hence their career development [11]. Accordingly, our study examined personal factors regarding three sub-factors: generic skills, personal circumstances, and academic performance, which, based on literature, can be efficient for individuals' career development and employability.

This research aims to address a notable gap in the existing literature, which is the determination of required skills from graduates' perceptions to put forth better possibilities for improving the Moroccan educational system and endeavor to improve their professional insertion, thus improving their employability and career development. The motivation behind this research lies in its potential based on evidence-based insights as it goes beyond assumptions to empirically determine which factors truly impact how employable students feel, allowing for more effective interventions to help understand how to better equip students for the workforce. While external factors matter, this research highlights the significant role of personal determinants in shaping employability to shift focus to the student's perspective. While most studies examine personal and contextual factors separately, this study's novelty lies in comparing them directly, revealing that personal factors have a more significant impact and focusing on a strong predictor of actual job-seeking behavior and success. Also, it offers a comprehensive model integrating academic, personal, and institutional factors, the research also provides a more comprehensive and nuanced understanding than previous work. It has the potential to strengthen the bond between policymakers, students, and government and give prominent insights for strategic orientation.

## 2. COMPREHENSIVE THEORETICAL BASIS

### 2.1. Hypothesis development

Generic skills outline soft skills enacted by multiple personal qualities. They are highly required by employers and most expected from graduates. Based on human capital theory, Mincer [11] suggests that the skills, knowledge, and experience of human capital may improve their productivity and most likely increase their future income. Also, Finch *et al.* [12] proved, as per their study, that generic skills play a significant part in employability. After years of research to determine these skills, the literature asserts that they comprise many competencies like critical thinking, teamwork, emotional intelligence, and self-esteem. The most common skill is teamwork, as confirmed by Tymon [13]: "interpersonal skills and teamwork appearing in all lists", enhancing students' ability to work in groups and raising interactivity and performance. Emotional intelligence on the other hand [14] enables students to understand their emotions and perceive those of others, therefore having a strong relationship. Finally, entrepreneurial ability encourages students to be brave, take risks, and go so far as to face challenges that they become agile and flexible [15]. Accordingly, this

study proposed the hypothesis as: there is a significant and positive association between generic skills and the perceived employability of engineering students (H1).

Personal circumstances are constituted by pivotal components affecting students' employability, namely social networks and access to capital. McQuaid and Lindsay [16] proposed that access to capital plays a predictor role in employability, so taking advantage of employment opportunities may be helpful. Regarding social conditions, personal networks could serve as an asset to ease job seeking. As confirmed by Álvarez-González [6], social connections directly impact decisions and career development. Based on the previous description, the hypothesis we proposed is as: there is a significant and positive association between personal circumstances and the perceived employability of engineering students (H2).

Academic performance exerts a crucial influence on employability. Students' academic success is considered a linchpin for perceived employability. This factor allows us to measure the student's self-perceived satisfaction with their performance during education courses through their grades and career aspirations. Given this background, we suggest that academic performance represents a personal factor. Accordingly, the following hypothesis was adopted in our study: there is a significant and positive association between academic performance and the perceived employability of engineering students (H3).

Rothwell *et al.* [4] and Fugate *et al* [7] confirmed the significance of contextual factors, they are examined by considering the reputation/brand of university and effect of instructors as well. Multiple findings reveal that the university's reputation is related positively to students' employability. Against this background, we developed the following hypothesis by considering that the contribution of IT engineering student's universities as a contextual factor will be significantly related to their perceived employability: there is a significant and positive association between university contribution and the perceived employability of engineering students (H4).

Personal and contextual determinants should be considered while explaining the perception of employability [7]. In our study, we attempted to compare the two types of factors since there was a lack of conclusive information in the literature. That being the case, we developed a fifth hypothesis to see the stronger effect of the two factors on perceived employability: personal factors have a strong impact on the perceived employability of engineering students than the effect of contextual factors (H5).

Given the theoretical literature, we proposed a conceptual model based on the hypotheses, as described in Figure 1. This model aims to illustrate the interplay between personal and contextual factors in shaping the perceived employability of engineering students. By examining these relationships, we hope to provide valuable insights for educators and policymakers to enhance employability outcomes through targeted interventions and support systems.

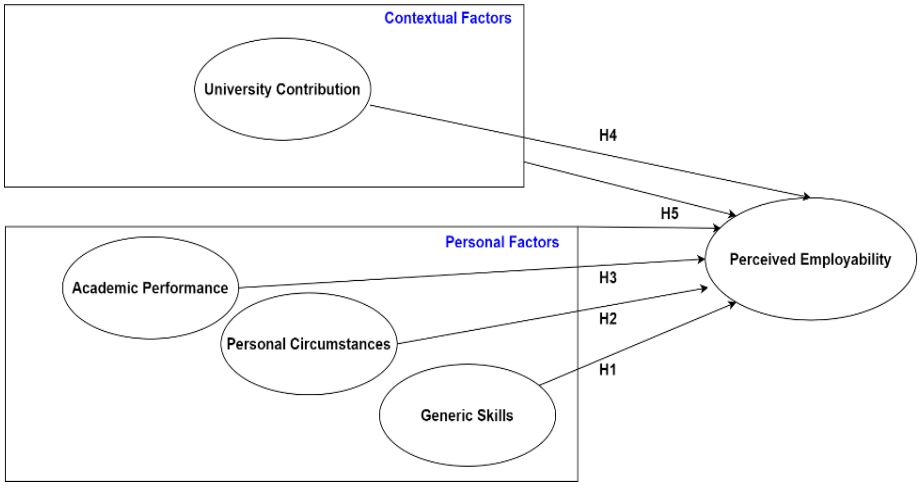


Figure 1. Perceived employability conceptual model with hypotheses

## 3. METHOD

### 3.1. Research method

The empirical quantitative research method was used to achieve the study's goal. In this empirical study, we employed an online survey-based approach to administer a questionnaire and gather data. The researchers suggest an assemblage of items representing the variables that might influence a student's perception of employability and, thus, their career.

### 3.2. Sample and scales

The study's target population comprises the National School of Applied Science of University Ibn Tofail (UIT) engineering students. The study used probability sampling to produce a representative result for the whole population. The population comprises 2015 engineering students in 2022-2023, according to the ENSSUP statistic reports of higher education in Morocco in 2023. With a margin error of 5% and a confidence level (z-score) of 95%, we calculated our optimal sample based on the central limit theorem, which states that the sampling will always follow a normal distribution [17], calculated by (1):

$$Sample\ Size = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1+(\frac{z^2 \times p(1-p)}{e^2 N})} = 323 \quad (1)$$

Considering ethical reflections, the participants were informed of the research goals and the gathered data and assured of full respect for their data and confidentiality. More than 350 engineering students were invited to participate for two months. The research questionnaire used the 7-point Likert-type scale as a measurement method, from 1 (strongly disagree) to 7 (strongly agree). All the multi-item constructs were adopted from existing studies based on literature regarding self-perceived employability (SPE) among university students [18].

### 3.3. Data collection analysis

To test our research model, we referred to structural equations modeling (SEM) techniques, as they are immensely used in educational research [19], overcoming the conventional techniques [20]. Partial least squares (PLS) SEM is a variance-based SEM, classified as a powerful approach to assess research models with multiple constructs and items [21]. PLS-SEM is considered appropriate for our research goals for many reasons. First, it supports large sample sizes [22], allowing us to work effectively since our sample size is over 350. Second, this approach enables the researchers to assess models with multiple constructs and items, handling complex models. Third, this approach embarks on the measurement and structural model, which is very interesting for assessing the study instrument and the conceptual model [23].

## 4. RESULTS AND DISCUSSION

### 4.1. Descriptive results

By and large, we received more than 353 responses from our administered survey. We performed a data cleaning to remove uncompleted or inappropriate ones, resulting in items meeting the minimum required to conduct our data analysis, as shown in Table 1. More than half of our contributors are aged between 21 and 25 (62%), and half of the sample are females, nearly males, allowing us to have a balanced representation. Finally, there are differences in the distribution of education levels between fathers and mothers. However, fathers with a high education are similar to that of mothers.

Table 1. Demographic characteristics of participants

| Variable | Item | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 159 | 45 |
| | Female | 194 | 55 |
| Department | Computer Science | 107 | 30.3 |
| | Civil Engineering | 42 | 11.9 |
| | Electrical Engineering | 92 | 26.1 |
| | Industrial Engineering | 17 | 4.8 |
| | Automotive Mechatronics Engineering | 49 | 13.9 |
| | Telecommunications Networks and Systems | 46 | 13 |
| Age | <=20 | 126 | 36.6 |
| | 21–25 | 222 | 62.9 |
| | >=26 | 3 | 0.8 |
| Mother's education | Non-lettered | 52 | 14.6 |
| | Lettered | 15 | 4.2 |
| | Primary | 37 | 10.4 |
| | Middle | 51 | 14.3 |
| | High | 120 | 33.7 |
| | Master's degree | 81 | 22.8 |
| Father's education | Non-lettered | 32 | 9 |
| | Lettered | 20 | 5.6 |
| | Primary | 28 | 7.9 |
| | Middle | 32 | 9 |
| | High | 121 | 34 |
| | Master's degree | 123 | 34.6 |

### 4.2. Statistical results

Based on the model evaluation process of PLS-SEM [24], we carried out data analysis and evaluation following two stages. First, the assessment of the measurement model consisted of the reliability to test the internal consistency as presented in Table 2, then the convergent and discriminant validity. Second is the measurement of the structural model.

This study applied the analysis process following guidelines defined by Hair *et al.* [25]. We first tested convergent validity using high factor loadings and the average variance extracted (AVE) to ensure that items are related within a construct. The statistical tests examined the instrument's validity to ensure that it measures what it intends to. Most items show recommended loadings (>=0.7), reflecting the intended construct, and the AVE values conformed to the stipulated value (>=0.5), indicating a solid convergence and explaining more than half of the indicator's variance. As for discriminant validity, we performed cross-loading to check how distinct a construct is from another; the test was satisfied with very good values superior to 0.5, and its square root is the highest correlation among any of the other constructs [26], as presented on Table 3 confirming that the constructs are distinct from each other. To ensure the questionnaire produces consistent results, the study has availed itself of internal consistency assessed using Cronbach's alpha. The coefficients attained the threshold of 0.7, indicating a good internal consistency reliability [27], and Rho coefficients were also consistently good. Additionally, the composite reliability (CR) values fulfilled even exceeded the recommended value (>=0.7), demonstrating the constructs are reliable.

Table 2. Confirmatory factor analysis with reliability and validity statistics

| Construct | Item | Convergent validity | | Internal consistency reliability | | |
|---|---|---|---|---|---|---|
| | | Loading | AVE | Cronbach α | CR | Rho |
| Perceived employability | PEmp1 | 0.793 | 0.514 | 0.86 | 0.89 | 0.869 |
| | PEmp2 | 0.721 | | | | |
| | PEmp3 | 0.622 | | | | |
| | PEmp4 | 0.746 | | | | |
| | PEmp5 | 0.678 | | | | |
| | PEmp6 | 0.733 | | | | |
| | PEmp7 | 0.697 | | | | |
| | PEmp8 | 0.733 | | | | |
| University contribution | UnCon1 | 0.709 | 0.595 | 0.82 | 0.88 | 0.830 |
| | UnCon2 | 0.803 | | | | |
| | UnCon3 | 0.812 | | | | |
| | UnCon4 | 0.785 | | | | |
| | UnCon5 | 0.744 | | | | |
| | UnCon6 | | | | | |
| Academic performance | APerf1 | 0.747 | 0.506 | 0.75 | 0.83 | 0.766 |
| | APerf2 | 0.656 | | | | |
| | APerf3 | 0.708 | | | | |
| | APerf4 | 0.655 | | | | |
| | APerf5 | 0.782 | | | | |
| Personal circumstances | PerCir1 | 0.928 | 0.753 | 0.68 | 0.85 | 0.794 |
| | PerCir2 | 0.802 | | | | |
| Generic skills | GSkill1 | 0.820 | 0.579 | 0.63 | 0.80 | 0.685 |
| | GSkill2 | 0.626 | | | | |
| | GSkill3 | 0.821 | | | | |

Table 3. Discriminant validity based on Fornell and Larcker's

| | GSkill | PerCir | APerf | UnCon | PEmp |
|---|---|---|---|---|---|
| GSkill | 0.772 | | | | |
| PerCir | 0.149 | 0.861 | | | |
| APerf | 0.553 | 0.188 | 0.712 | | |
| UnCon | 0.368 | 0.252 | 0.571 | 0.733 | |
| PEmp | 0.442 | 0.376 | 0.600 | 0.571 | 0.717 |

Overall, the findings presented in Tables 2 and 3, in one aspect, prove that the model has internal consistency and is reliable. In another aspect, the model has convergent and discriminant validity, according to Fornell and Larcker [26]. Following the structural model evaluation assessment guidelines, the PLS results in Figure 2 show that factors explain nearly 50% of the perception of employability among Moroccan engineering students, as indicated by the coefficient of determination R2.

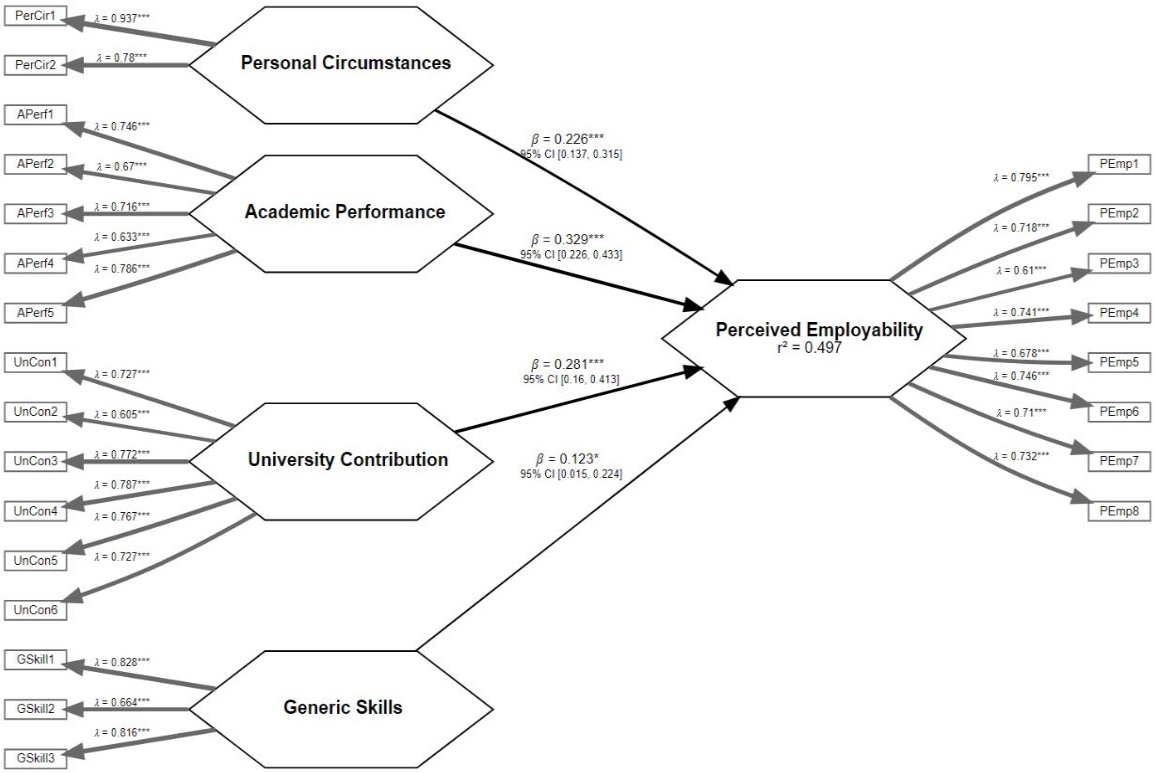


Figure 2. Measurement and structural model of SPE

In Table 4, we find that the first proposed hypothesis was accepted based on a T-statistic of 2.494 and a low p-value of 0.013, confirming the existence of a relationship between generic skills and perceived employability. The findings account that H2 and H4 were also accepted ((t=5.639, p=0.000), (t=4.365, p=0.000)), indicating that personal circumstances and university contribution exert a positive and significant impact on the perceived employability of engineering students. Moreover, academic performance has the strongest relationship with a positive and statistically significant influence on perceived employability (t=6.655, p=0.000), supporting H3. The results indicate that contrary to expectations, personal factors have a stronger effect on perceived employability than contextual factors, as presented in Figure 3 and Table 4, which explain up to 51% of employability perception among engineering Moroccan students; therefore, H5 is accepted. Based on the results obtained through bootstrapping, we conclude that academic performance, university contribution, and personal circumstances significantly impact perceived employability. Also, generic skills have a rather positive impact on the explained construct, which means that these factors and general skills have a crucial role in how employable future engineers perceive themselves to be.

Table 4. Path and bootstrapping analysis

| Hypothesis | Relationship | Original sample | STD | T statistics | P Values | Result |
|---|---|---|---|---|---|---|
| H1 | GSkill->PEmp | 0.124 | 0.05 | 2.494 | 0.013 | Accepted |
| H2 | PerCir->PEmp | 0.228 | 0.041 | 5.639 | 0.000 | Accepted |
| H3 | APerf->PEmp | 0.350 | 0.053 | 6.655 | 0.000 | Accepted |
| H4 | UnCon->PEmp | 0.295 | 0.059 | 4.365 | 0.000 | Accepted |
| H5 | PersonalFactors->PEmp | | 0.053 | 9.630 | 0.000 | Accepted |
| | ContextualFactors->PEmp | | 0.062 | 4.196 | 0.000 | |

### 4.3. Discussion

The current research study conceptual model consists of personal and contextual factors as input to measure the influence of five dimensions presented as: generic skills, academic performance, personal circumstances, and university contribution on perceived employability as output measured by multiple items. Additionally, it contributes to the literature by presenting standout findings in this empirical study. The noteworthy outcomes were based on what had been expected regarding the proposed hypotheses, and the available results posit that generic skills have an acceptable influence. Furthermore, teamwork, emotional

intelligence, and entrepreneurial abilities could be helpful for student's employment. Additionally, this result can be an interesting resource about our ongoing studies regarding analyzing the emotions of students [28], student engagement [29], predicting their personality traits [30], or even our ambition to improve their perception of this determinant using a serious game in higher education.

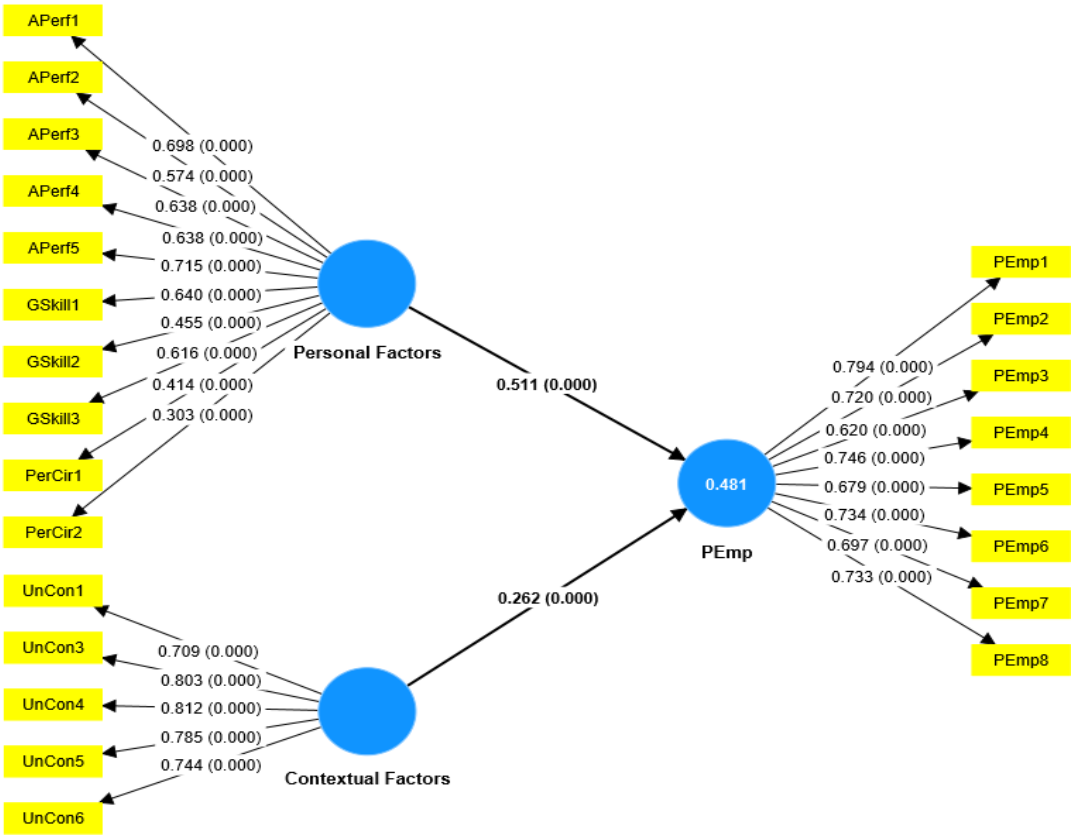


Figure 3. Structural model for SPE with the two-factor families–smart PLS

In the light of the investigation conducted, the results demonstrated that the five scales have a positive and significant influence. Among all the factors, academic performance had the highest positive impact on perceived employability, conforming with the proposed theoretical model. According to the literature, academic performance is a measurable assessment employers consider during recruitment. Besides, students with high academic performance are more ambitious and motivated to have a successful career. As mentioned before, universities have a crucial mission to provide students with the required knowledge and skills in the work sector for their employability and, at the same time, contribute to their professional integration through the connections they make between employers and academic networks via forums and workshops [31].

Ultimately, personal factors have a significant influence and stronger effect on perceived employability more than contextual factors, pointing out that academic performance, personal circumstances, and generic skills are highly linked to the employability perception of engineering students. Many research studies have considered comparing these two types of factors. Berntson *et al.* [32] outlined that factors associated with human capital rather have more impact on employability than other factors, such as labor market ones. However, the study of Ergün and Şeşen [18] showed that contextual factors had a larger impact than personal ones in their context, following a detailed as shown in Table 5 that compares current findings with existing literature to highlight these variations.

Finally, this research provides a blend of theoretical advancements, empirical findings, and methodological insights relevant to SPE and education. Theoretically, it enhances the comprehensive model that integrates personal, academic, and contextual determinants to understand better the factors influencing SPE, contributes to the literature by distinguishing the concept of employability from related constructs, and provides a refined theoretical framework for future research. On the methodological aspect, it demonstrates

using PLS-SEM the robustness and applicability of this method in studying this concept, exploits advanced validation techniques to ensure the reliability and validity of the constructs using advanced validation techniques such as outer loadings, AVE, Cronbach's alpha, and CR. The research ensures that the constructs are distinct from each other to enhance the methodological rigor by performing cross-loading and using the Fornell-Larcker criterion. On the empirical aspect, the study provides practical insights for educational institutions, policymakers, and career services to focus more on improving students' personal attributes, precisely academic performance and generic skills, to improve their employability.

Table 5. Comparison of current findings with existing literature

| Study | Findings | Comparison with current study |
|---|---|---|
| 1 | Finch *et al.* [8] introduce the concept of integrated dynamic capabilities (IDCs), suggesting that the ability to reconfigure and mobilize resources is crucial for employability. This contrasts with the more static view of generic skills in the second study | Both studies recognize the importance of academic performance, Finch *et al.* [8] suggest that it is not a unique differentiator among graduates, whereas our study finds it to have the strongest influence on perceived employability. |
| 2 | McQuaid and Lindsay [16] acknowledge personal circumstances, such as caring responsibilities and financial commitments, as barriers to employability. They argue that personal circumstances directly affect an individual's ability to engage with the labor market, emphasizing the need for supportive policies. | Both studies highlight the importance of personal circumstances in shaping employability perceptions, though our study emphasizes the role of academic performance and generic skills more prominently. McQuaid and Lindsay [6] provide a broader context by discussing the implications of these factors within labor market policies. |
| 3 | Álvarez-González *et al.* [6]: analyze university contribution in relation to other specific factors, such as industry partnerships or curriculum design, providing a more targeted perspective. Also recognizes the importance of university contributions but may focus more on specific programs or initiatives that enhance employability, such as internships or career services. | Both studies underscore the importance of university contributions to enhancing employability. Our study emphasizes a broad integration of factors influencing perceived employability, while Álvarez-González *et al.* [6] may provide a more focused analysis on specific university initiatives or programs. |
| 4 | Ergün and Şeşen [18] emphasize both personal and contextual factors, with a notable focus on the external labor market as a key determinant of perceived employability. Also, concludes that contextual factors have a larger impact than personal factors in their specific context. | Both studies contribute to the understanding of perceived employability by examining personal and contextual factors. However, Ergün and Şeşen [18] emphasize the significance of contextual factors, particularly the external labor market, while our study highlights the stronger influence of personal factors, especially academic performance, and generic skills. |
| 5 | The study finds that students from higher-ranked universities perceive themselves as more employable compared to those from lower-ranked institutions. Rothwell *et al.* [4] emphasize university reputation, entry grades, and social class as key determinants of SPE. | Both studies contribute to understanding perceived employability but differ in their focus and findings. Rothwell *et al.* [4] emphasize the influence of university reputation and social class, while our may explore additional dimensions affecting employability perceptions. This comparison highlights the multifaceted nature of employability and the various contexts in which it can be studied. |
| 6 | Knight and Yorke [33] emphasizes the integration of employability into curricula through a blend of personal qualities, skills, and disciplinary understanding. Suggesting that employability is broader than academic performance and focuses on personal attributes and skills. | This supports our finding that academic performance has the highest positive impact on perceived employability. |
| 7 | This study emphasizes the importance of both soft skills (communication, teamwork) and hard business knowledge (gained through academic performance and work experience) for graduate employability. It also touches upon the role of career management skills. | Aligns with the current study's finding of five scales having a positive influence on perceived employability. |
| 8 | The study by Coetzee and Engelbrecht [34] examines how employability attributes mediate the relationship between career adaptation concerns and SPE among knowledge workers. | This supports the statement that academic performance is a measurable assessment considered by employers. |
| 9 | The study by Sánchez-Queija *et al.* [28] examines differences in SPE between university and vocational education and training (VET) students in Spain. It explores how factors like gender, work experience, and perceptions of job market precariousness influence SPE. | Both studies contribute to the understanding of perceived employability but differ in their focus and findings. This comparison highlights the multifaceted nature of employability and the various factors that can influence it in different educational contexts and highlights the cyclical relationship between perceived employability and proactive career behaviors. |
| 10 | The study presents a structured framework that delineates the antecedents, dimensions, and outcomes of SPE, highlighting the need for a student-focused perspective. | Duggal *et al.* [29] suggests a comprehensive approach for higher education institutions to enhance students' employability confidence. Also, our study recommends that universities improve their role in developing students' skills and enhancing employability perceptions. |

## 5. CONCLUSION

To conclude, our research is valuable since it followed a comprehensive and quantitative approach to investigate the concept of employability and career development from students' perceptions in Morocco. From one vantage point, this empirical study proposed a conceptual model to measure and assess SPE. From another vantage point, it has insightful contributions to the literature. First, our model illustrates that multiple determinants studied and retrieved from literature explain nearly half of perceived employability among engineering students. Second, the interesting findings linking the dimensions (academic performance, generic skills, personal circumstances, and university contribution) with the explained phenomena (perceived employability) tested statistically. Third, our study fills an existing gap between higher education and employment by providing insightful results collected from the individuals in the bridge between both. From a practical point of view, our study can contribute as a reference for all concerned stakeholders, universities, students, employers, and policymakers for a better understanding of the employment requirements along with the student's ambitions and motivation so they can have a successful career and a good job performance. Finally, a comparison between the personal factors having the strongest influence on perceived employability and the contextual ones can lead future studies to focus on enhancing the personal determinants, especially working on developing the importance of generic skills in engineering, as it is one of the major factors for employers. As with any research study, we can present suggestions for further improvements. On one hand, this research relied on a Moroccan sample of students at the University Ibn Tofail and, more precisely, the National School of Applied Science of Kenitra, which makes our research bound to the Moroccan context. On another hand, the data collected was limited to engineering students of specific departments. Future research can enhance this limit by working on a larger sample of participants, including other disciplines. Measuring a model based on employers or higher education perceptions could raise an interesting improvement as this study assessed perceived employability based on self-reported data. Although we used a restricted number of measures in our comprehensive and structural model to fit the purpose of our study, further studies can work on including other determinants present in the literature, especially in the contextual factors like external job sector or academic consulting.

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## AUTHOR CONTRIBUTIONS STATEMENT

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

## CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

## DATA AVAILABILITY

The data that support the findings of this study are available on request from the corresponding author [ZS]. The data, which contain information that could compromise the privacy of research participants, are not publicly available due to certain restrictions.

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