# Women Architects in Practice: Opportunities and Challenges in Algeria

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## Abstract

A significant imbalance exists between the number of female graduates from Algerian universities in different regions and registered women in the National Board of Accredited Architects. In this context, this paper examines the issue of the under-representation of accredited women architects in Algeria.

The research employs an online survey as a methodology. Three hundred and one women architects were sent an online questionnaire. According to the survey, this discrepancy is attributable to the withdrawal of some women from the job market due to external factors and intrinsic constraints and the migration of another segment to other fields allied to architecture. Among the challenges facing women are the heavy duties of the architects, the stressful and time-consuming nature of their work, and the persistence of the male-dominance.

However, besides the ever-narrowing gap between practicing male and female architects, other emerging factors in the field appear to have promising prospects for women. These include the gradual shift to remote work, flexible routines at local and global levels, and the flourishing of new innovative fields allied to architecture that favor women.

**Keywords:** Women, Architecture, Profession, Work-life balance, Remote work

## Introduction

Throughout history, construction has always been considered a domain of men as it heavily relies on physical efforts and requires tremendous endurance. In architecture, which was always the allied discipline to this domain, women were excluded from joining arts schools.

At present, their presence in architecture schools does not synchronize with practice. Regardless of cultural and socio-economic differences between countries, this situation seems to be the same globally. According to De Graft-Johnson *et al.* (2005), the trend of excluding women architects from the job market is a loss of human and qualified resources. Despina Stratigakos (2016) also raises the same question in her book titled "Where are the women

architects?". She emphasizes that both educational authorities in charge of the academic curriculum and female students that choose architecture for study need to be sufficiently aware of the latent agents that constantly face women architects after graduation (Stratigakos 2016).

In Europe, where data on female architects is most available, the proportion of women architects was 39% in 2014. It then increased to 46% in 2022 (Mirza & Nacey Research 2015; 2022). However, the number varies significantly from one country to another. For instance, the number of registered women architects in the UK increased from 12% in 2000 to 27% in 2022, while in France, it has jumped from 17% in 2000 to 43% in 2020 (Fowler & Wilson 2004; Mirza & Nacey Research 2022). High rates of female architects are primarily in eastern countries such as Croatia, Greece, Italy, Latvia, Lithuania, Romania, and Sweden (Mirza & Nacey Research 2022). Similarly, the most male-dominated countries are Austria and Hungary (Mirza & Nacey Research 2022). Nevertheless, the feminization of the architectural profession is expected to grow further in Europe due to the ever-increasing number of female graduates from architectural schools (Petrescu *et al.* 2015). As the Architects' Council of Europe (ACE) report of 2022 states, the profession will become more balanced between the two genders in Europe in future (Mirza & Nacey Research 2022).

In the Middle East, the statistics on women architects are much less than in Europe. Some selective sources, such as documentaries titled "*Documentary: Arab Women in Architecture* 2013", international prizes titled "Tamayouz Excellence Award (2020)", and some website articles (Alsammarae 2019), focus on the achievements of iconic female architects and shed light on their challenges. Some studies (Yalçınkaya Çalışkan & Acar 2016; Aydın & Erbil 2022) have investigated the exposure of female architects to career barriers that align with findings from European and American contexts as in the Turkish context.

In Algeria, the professional field of architecture presents the same discrepancies. Similar to other less developed countries, studies and statistics regarding this issue still need insights as studies are rare, although some do exist Achour-Bouakkaz and Cherrad (2016) which have started to address this issue.

Accordingly, this research specifically presents the current situation of women architects in Algeria. It first gives data collected from four architecture departments in Algeria (from 2017 to 2022), and confronts it with that of the Algerian Architects National Board (CNOA: Conseil National des Architectes Algériens) that regulates the architecture profession. It then addresses the following questions: Why is there a difference between the two statistics; females at the university and their accreditation by the national board? What challenges do women architects face in pursuing their careers in architecture? Furthermore, how can the presence of women in the labor market be improved?

This paper aims to provide an overview of the current status of women architects in Algeria and investigate the underlying reasons behind the paradox of a significant presence of women in architecture schools and a minor presence on the accredited board of architects. At an upper level, it analyzes the challenges that impede women from pursuing a formal career in architecture and explores perspectives that empower women for better inclusion in the architectural profession. Its objectives are as follows.

1. To raise of awareness among female students who choose architecture, and other stakeholders.
2. To empower women in the field and find better ways of their insertion in the market.

## Review of Literature

Studies on women in architecture goes back up to 1897, when a decision was taken to permit women to attend art courses in the Beaux-Arts school, the cradle of architectural education (Conte 2018). Contemporarily, the literature points out many constraints facing women architects and pushing them to shift to easier careers and other sub-fields (Fowler & Wilson 2004; De Graft-Johnson et al. 2005; Aydın & Erbil 2022; Möller et al. 2022). According to Fowler and Wilson (2004), among the challenges that make architecture a very demanding profession that negatively affects personal life in the UK, are the long hours of work, the competitive environment, the slow career progression and the low wages. Often, the difficulty

of balancing between motherhood responsibilities and professional career constrains women architects to undertake part-time jobs. Tough competitiveness also makes success very difficult for small architecture companies and women architects leading new consultant offices. In most advanced countries in Europe and north America, women architects often feel tensioned as they are constantly being told that pregnancy will result in a salary cut.

As regards the construction domain that favors men in terms of ownership, leadership, and innovation Stratigakos (2001; 2016) and Heynen (2012), consider that it is due to the masculine stereotyped image of an architect, known as the star architect system. This facilitating factor, is coupled with the client's mentality that is less open to women architects (Fowler & Wilson 2004). As a result, while women architects remain in the shade, men dominate the profession and find their way to be star architects (Ahrentzen & N.Groat 1992).

On the variation of skills that vary according to gender, some studies conclude that spatial needs of women and children are better understood by female architects because of empirical considerations (Tancred, Peta & Adams 2000). Women architects think more about functional space, flexibility and user's wellbeing. Therefore, McDowell (1982), Fowler and Wilson (2004) and Mashhadi Moghadam and Rafieian (2019) agree that having more female practitioners in architectural design and urban planning would enhance inclusive cities to women and children, and afford a more convenient built environment. In her paper: 'A Feminist Approach to Architecture: Acknowledging Women's Ways of Knowing', Franck (2000) cites seven qualities that characterize women's way of knowledge and creation, which consist of the desire to: 'Connectedness', 'Inclusiveness'; Responsibility to others as a reflection of care', 'Acknowledgment to everyday life', 'Subjectivity', 'Complexity' and 'Flexibility'. These criteria appear in the architectural design produced by women and in their professional behavior in general. However, Fowler and Wilson (2004) and Sandberg (2013) conclude that despite women practitioners having strong work skills, they show some flaws, as they lack self-confidence, leadership skills, and entrepreneurial power.

The limited number of women architects that is reflected in the official statistics, often screens the practice of women architects in other forms or fields that relate to architecture (Tancred, Peta & Adams 2000; Caven 2006; Möller, Dupré & Fernando 2022). An important number of graduated women prefer not to be licensed and choose other allied fields, which are more accessible to women, such as interior design, historical preservation, kitchen design, teaching and volunteering (Ahrentzen & Groat 1992; Tancred, Peta & Adams 2000; Stratigakos 2001). In case where she is a member of an architect's family, it helps to practice architecture in a shaded position. For all these reasons, Tancred, Peta and Adams (2000) consider that the assessment of women presence in architecture should consider these unnoticed practices and not exclusively rely on the official registrations. Unlike earlier work, Stratigakos (2016) points out another factor that is related to education, which is the absent representation of female role models in academic curriculums, exhibitions and history of architecture. She suggests that female graduates need to be prepared for the professional conditions they will encounter. Ahrentzen and N.Groat (1992) explain that the detachment of architectural departments from reality has generated a narrow vision of the architectural practice.

As for the Algerian context, the contribution of women architects to urban development was examined in the article done by Achour-Bouakkaz and Cherrad (2016) within the context of the new city (Ali Mendjeli) in Constantine. They address questions regarding the involvement of women architects in shaping space, usage patterns, and spatial practices through residence, mobility, and lived experiences. Furthermore, the article delves into Constantine's urban policy concerning women in the urban environment. The study establishes a connection between "women in space" and "women of space". Furthermore, it critiques the limited impact of women (architects, urban planners, technicians) in advocating for the needs of female users in public spaces, despite their substantial presence in the professional realm. It underscores the significance of incorporating this dimension in urban configuration and planning policies, recognizing Algerian women as a valuable social, economic, and political resource.

To sum up, the review of the selected literature reveals a consistent narrative of gender disparities and challenges faced by women architects. The literature collectively underscores

the need for transformative changes within architectural education, practice, and industry norms to address the systemic barriers that hinder the advancement of women in architecture. While each reference contributes valuable insights, there is an apparent need for continued research and action to foster a more inclusive architectural profession.

However, it does not imply the north African context, including Algeria, with its distinct Muslim culture and socio-economic dynamics. Consequently, there arises a necessity for a study that contextualizes the situation and reflects the current realities. The literature concerning the Algerian context acknowledges the issue, tackles social and political aspects, yet it lacks official statistics and a comprehensive overview of the profession. It also calls for a deeper lecture of the direct and indirect factors contributing to the limited presence of women architects in Algeria.

## Background

### Education Vs. Career in Algeria

As in most developing countries, the female graduate workforce in Algeria does not enter the labor market, as a result of unemployment among the university graduates. For most graduates, employment depends heavily on the public sector. Therefore, the private sector needs to be more empowered (Mokrani & Hami 2018). This is more so in the case of the construction sector and architecture, which often suffer from economic recessions and continuous tax increases.

In fact, despite a high proportion of females at the universities, their presence within the profession is small. However, it is difficult to estimate the actual numbers of working women given that some practices are informal and, thus, not declared. According to the National Statistics Office (ONS), women in higher education was estimated at 61.1% in 2014 (Mokrani & Hami 2018). They represent 20.4% of the active labor force, accounting for 17,3% of women at the age of work (ONS 2019a). Among them, 45.1% are concentrated in the health and social sectors, while 1.4% work in the construction industry (ONS 2019b). Interestingly, these numbers are predicted to rise-up in the coming years (Mokrani & Hami 2018).

Besides the economic factors, some cultural and social aspects discourage women's participation in professional work. In the traditional Islamic culture, family guardianship goes to men. In fact, religious teachings dissuade women from frequent contact with non-relative men. Married women, whether at home or work, have been the significant carers of children since an early age, and outside work is considered primarily a male task. Mokrani and Hami (2018) point out that too often, the rigid work systems in public and private institutions exclude women from the labor force. Statistics show that the presence of women in the workplace peaks at the age of (25-29) and then declines (Musette 2014; ONS 2019a). However, the low incomes of Algerian families and other social factors are becoming the stimulating agents of change. Paradoxically, they are also factors that push women to undertake jobs in unfavourable conditions.

### Architectural Education and Profession in Algeria

Architecture education was first introduced to Algeria in 1889 by the French colonial government and it underwent several phases. It shifted from the School of Fine Arts, Beaux-Arts, in 1970, i.e., eight years after independence, to the present unique national polytechnic school of architecture and urbanism, (EPAU: Ecole Polytechnique d'Architecture et d'Urbanisme). At first, the study duration was six years. Then, it was reduced to 5 years. Since then, many departments have been inaugurated over the territory.

In 2008, the university system, headed by the Ministry of Higher Education and Research, was aligned to the universal one known as the L.M.D. system referring to License for three years, Master or two years, and Doctorate for three years (Mazoun 2017). Today, 17 universities offer architecture education, besides the oldest school. Among these are Oran University (1978) at the West, Blida University (1981) at the Centre, Annaba University (1997) and Setif University (2010), both at the East (Mazoun 2017).

The Algerian Architects National Board (CNOA: Conseil National des Architectes Algériens) is responsible for overseeing professional practice. Established in 1994, it is now

the only institution regulating the profession and accrediting graduate architects. According to its protocols[1], a fresh architect is not granted accreditation until after completing 18 months of training in an accredited office. An oath ceremony for accredited architects is organized every two years in which the certificates are granted for the applicants to establish their consulting firms (Officiel 2014). However, CNOA accreditation is limited to consultancy and is not required for other related activities, such as contracting, decorating agencies, or employment in public agencies.

## Research Methodology

In this study, data were collected from four architecture institutions in Algeria to ascertain the female architect's participation in professional practice. The statistics of the graduate architects in Algeria during the last five years (from 2017 to 2022) were classified according to gender. They were gathered from 4 architecture departments located primarily in the North: the most inhabited coastal region of the country, which accounts for around 85% of the population. They are: Setif University and Annaba University from the East, Oran University from the West, and Blida University in the Central region next to the capital city, Algiers.

The other data set is obtained from the National Board of Architects, CNOA, published in registers and annually updated. The selected data that correspond to graduation range from 2017 to 2020. In order to investigate the challenges and obstacles for women to enter the profession, an online survey was undertaken. The survey took place from August 2020 to October 25th, 2020. A questionnaire was sent to 1600 women who graduated from any architectural educational institution and live in Algeria. This was done through a mass email first sent to accredited women architects registered in the CNOA database. The questionnaire received 180 responses. After that, it was sent to the academics and women in the research and social networks, such as LinkedIn and Facebook. Prior filtering regarding profiles was undertaken. In total, 301 participants responded, and results were thus compiled and analyzed through Microsoft Excel applications.

## Survey Structure

**Table 1:** The main variables discussed in the survey and their references.
Source: Author

| Question | Reference |
|---|---|
| Work within or outside the architectural field (Questions 4,5,6,7.8) | (Tancred, Peta & Adams 2000; Caven 2006; Möller, Dupré & Fernando 2022) |
| Preferred work environment (Question 9) | (Möller, Dupré & Fernando 2022) |
| Preferred mode of work (Question10) | (Tancred, Peta & Adams 2000) |
| Challenges of the professional environment (Question 11) | (Stratigakos 2001; 2016; Fowler and Wilson 2004; De Graft-Johnson *et al.* 2005; Aydın & Erbil 2022; Heynen & Pérez-Moreno 2022; Möller *et al.* 2022) |
| Respect from colleagues and clients (Questions 12 and 13) | (Fowler & Wilson 2004; Spaeth & Kosmala 2012; Pickerill 2015) |
| Lacking skills (Question 14) | (Fowler & Wilson 2004; Sandberg 2013) |
| Ways of empowerment (Question 15) | (Caven 2006; Amaratunga *et al.* 2008; Sandberg 2013; Smitheram & Kidd 2020; Aydın & Erbil 2022) |

The survey comprises 16 questions in four main sections. The four sections are derived from the literature as presented in the Table 1 and correspond to similar studies conducted in other countries.

[1] Executive decree 98 153 of 05/18/98. Article 1284 of this decree defines the form, content, duration and conditions of the realization of the placement of the registration in the Chamber of Architects. (Mazoun 2017)

The first section aims to inquire about the different social categories and professional groups to which a woman architect may belong. It consists of personal information such as age, marital status, graduation year, accreditation, and current professional status.

The second section inquires about the participants' professional status. It asks about the roles women perform within or outside the field of architecture. In addition, the questions also allow multiple answers, given the multi-functionality of architecture. The questions intend to uncover the preferences of women architects related to employability, such as being an agent in the private or the public sector, a freelancer, a job owner, an associate, or working inside the office or at the construction site.

The third section, which is the most important one, inquires about the barriers women architects face in practice. Options for answers are derived from the literature. Barriers can either be external, i.e., caused by society and institutions, or internal, i.e., related to women's self-esteem and inherent skills. The most significant external barriers consist of work-life balance, social considerations, religious considerations, pressure at work, toxic work environment, and male dominance. Unemployment is added as an option even though it is not necessarily a gender-related problem. Respondents were allowed to select multiple choices and add other barriers to the open list. As complementary information, two other questions based on the Likert Scale (Likert, 1932) related to the respect of women architects' decisions as colleagues and clients is added.

The internal constraints consist of the skills that women architects are mostly lacking, namely: psychological skills, i.e., working under stress and self-confidence, poor graphics software and computer skills, practical knowledge, such as administrative procedures, site monitoring, the materials and equipment market, and communication skills, i.e., the professional networks and communicating with the client. Participants, in this case, were allowed to select more than one choice and add other responses.

The final survey question related to the envisaged empowerment measures that managers and policymakers should take concerning women architects as conceptualized by the respondents. Besides the stated options, the participants were allowed to have multiple choices and add other possible answers.

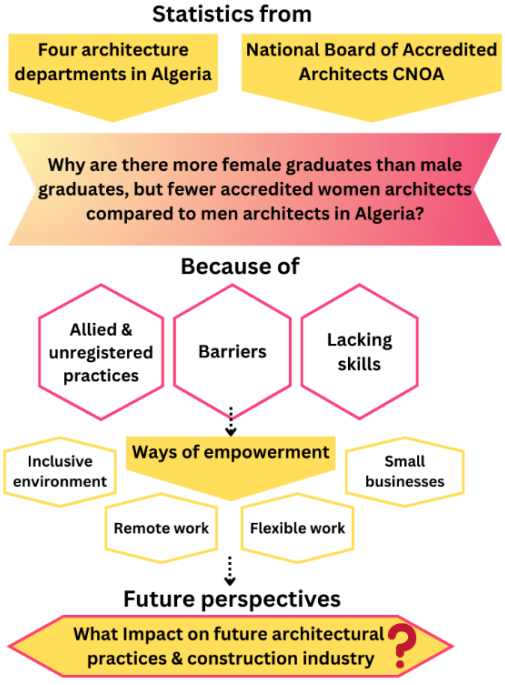



**Fig.1:** Graphical representation of the line of discovery and argument
Source: Author

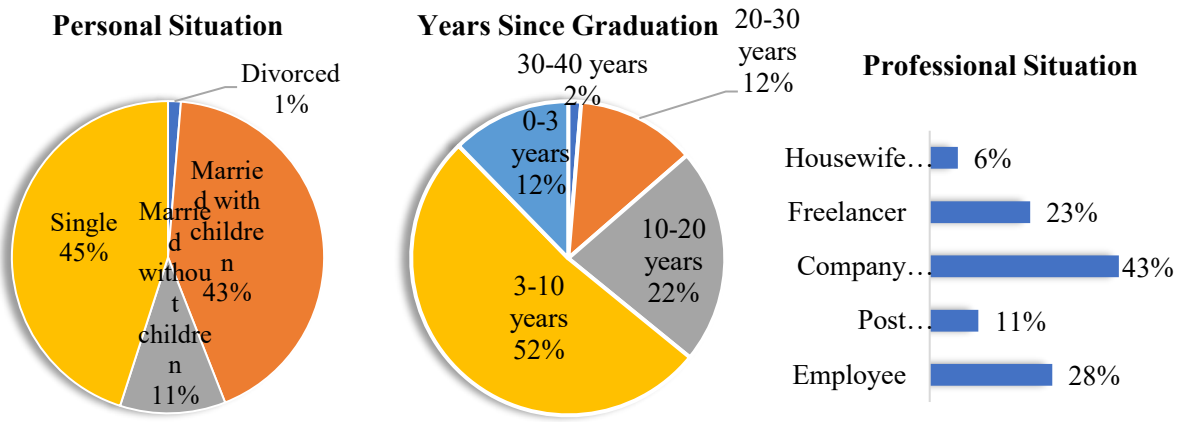



**Fig. 2:** Sample Definition.
Source: Author.

## Findings

Initially, the survey was open to all women architects. However, it was more oriented to female architects with more than three years of experience for accuracy, which permits mature answers. Accordingly, 52% of the participants were from a cohort 'graduated after 3 to 10 years', 34% were 'after 10 to 30 years', and 12% were 'fresh graduates from 0 to 3 years' (Fig. 2).

Moreover, the survey combined accredited and non-accredited women architects, among which 61% carried architectural accreditation, and 39% did not. in terms of the professional status, 43% of the sample were business owners, 28% were employees, 23% were freelancers, and 11% were postgraduate students. The variety of professional standing of the sample provides a large image of women's positions as architects in Algeria. Socially and culturally, it was essential to include the marital situation to obtain results on the impact of personal life on the profession. 45% were single women, 43% were married and having kids, and 11% were married without kids.

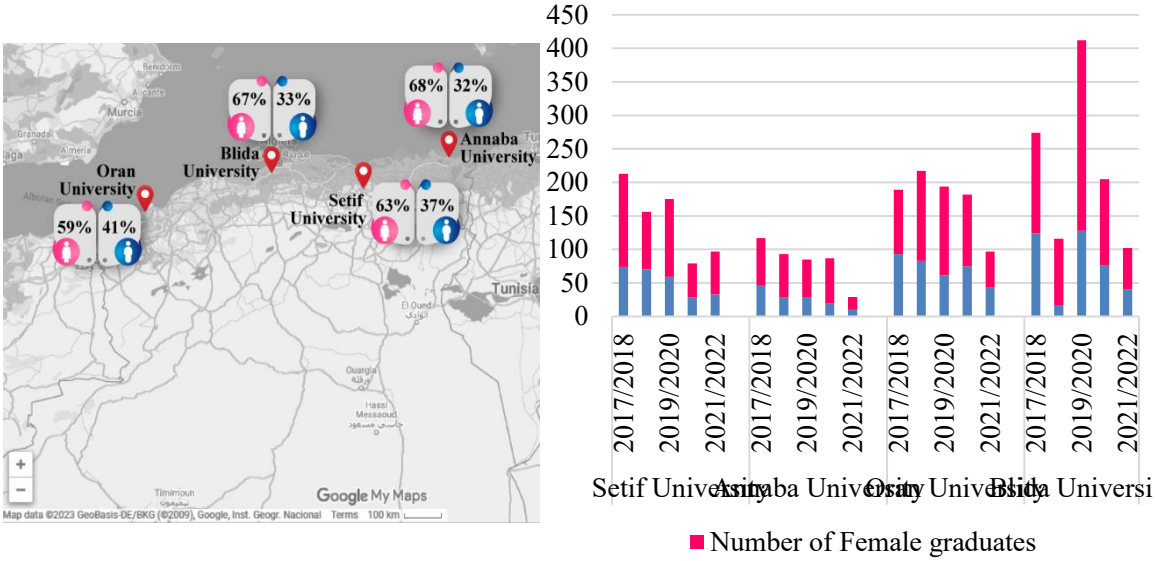
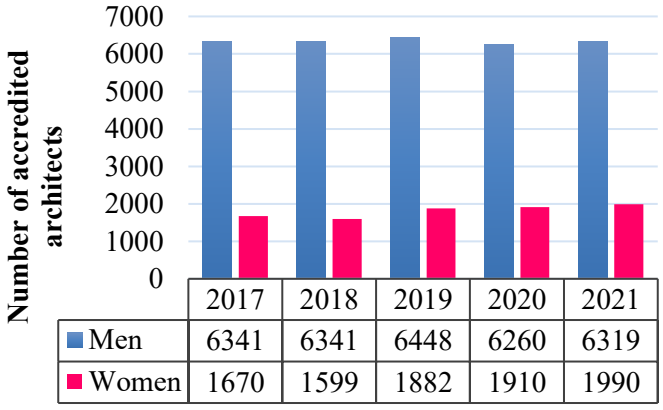



**Fig. 3:** Graduates of four architecture departments in Algeria according to gender from 2017 to 2022.
Source: Author.

**Women Architects: the University Vs. the Profession**

As shown in the Fig. 3, freshly graduated women are taking a share of more than half in all the universities and successive academic years. During the last five years, it had been around 63% at Setif University, 59% at Oran University, 68% at Annaba University, and 67% at Blida University. The average of female graduates is, therefore, 64.25%.




| | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|
| Men | 6341 | 6341 | 6448 | 6260 | 6319 |
| Women | 1670 | 1599 | 1882 | 1910 | 1990 |

**Fig. 4:** Accredited architects in Algeria from 2017 to 2021.
Source: CNOA 2021, graphic done by the author.

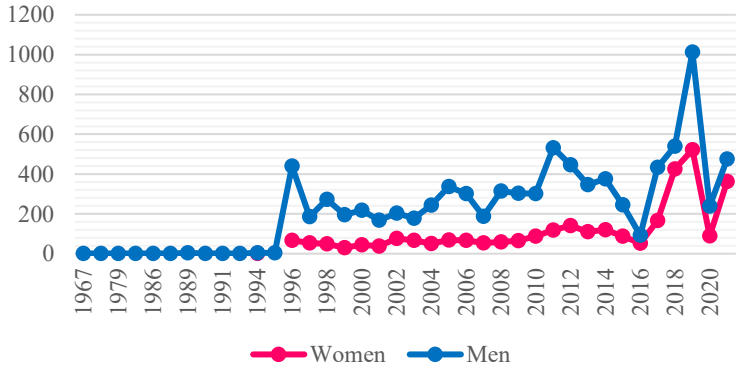



**Fig. 5:** Analysis of (2021) accredited Men and Women architects according to their year of oath.
Source: CNOA 2018 and 2021, graphic done by the author.

In the practice domain, the total number of accredited architects from 2017 to 2021 is presented in Fig. 4. Until 2021, accredited women architects had represented a minority, with only 1990 females comprising 8309 architects. Fig. 4 shows a slight increase of 3%, from 20,8% in 2017 to 23.9% in 2021.

Fig. 5 is a combination of 2018 to 2021 statistics. It analyses the existing architects in 2021 according to the year they received accreditation. The timeline demonstrates that the eldest woman architect received her accreditation in 1994, considering that the Algerian Board of Architects CNOA was established in the same year. However, a group of 66 women architects received their accreditation in 1996. From that year to 2016, a significant gap has remained between the two genders. 2016 appears to be an articulating point as the gap between the two genders starts to narrow, and the women architects are significantly present among the new architects. The peak of newly accredited architects goes back to 2019, in which 522 women have done the architectural oath. Numbers dropped suddenly in 2020 in parallel with the COVID-19 situation. Interestingly, the presence of the two genders is getting closer in 2021, in which 363 women architects have joined the official board of architects, compared to 475 men architects in the same year.

The following findings from the online survey were registered to explain the reasons behind the gap between the presence of women in universities and the list of accredited women.

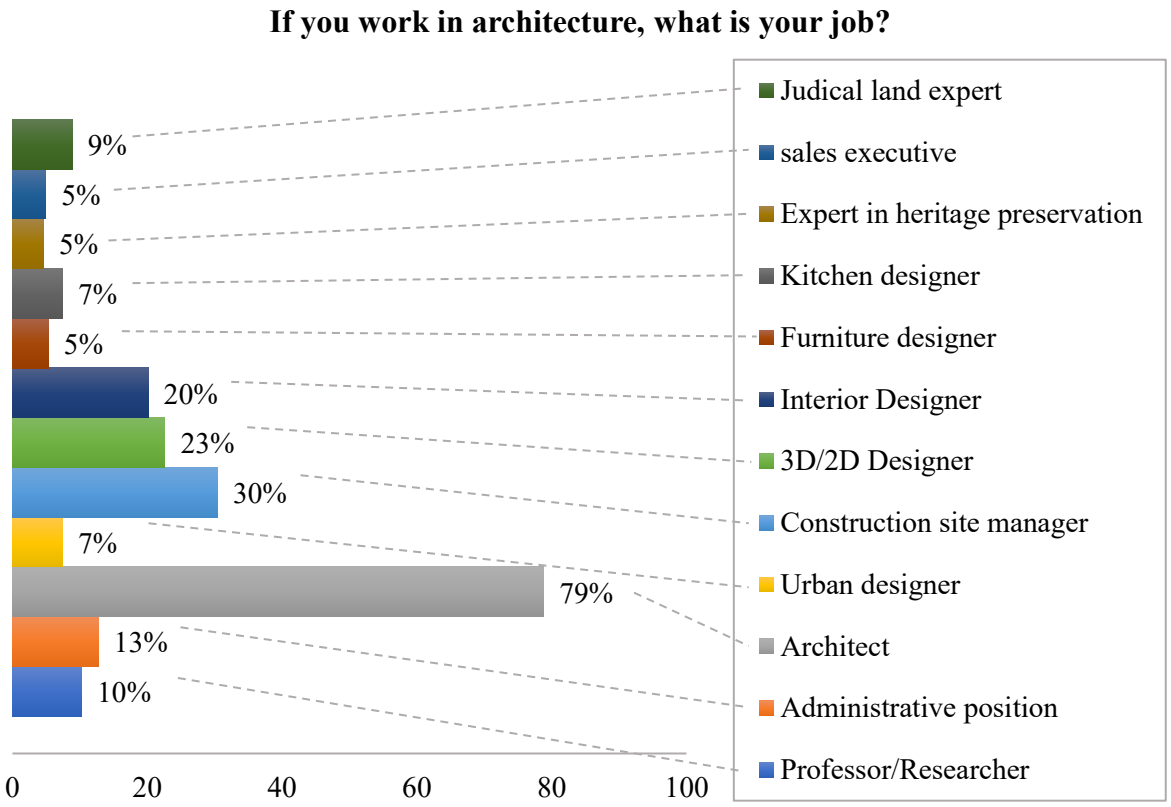



**Fig. 6:** Main architectural professional titles and allied jobs.
Source: Author.

## One Major and Several Career Paths

On asking about their professional status, 94% of the surveyed women answered that their jobs are within the broad field of architecture. As shown in the Fig. 6, most women (79 %) work as architects-designers. However, they simultaneously occupy other roles. Among the surveyed women, 30% work in construction site supervision, 23% are 3D designers, and 20% work in interior design. In a lesser portion, 13% occupy administrative positions in the public sector, and 10% are university professors-researchers. Only 9% are judicial land experts. Urban and kitchen designers represent 7% of the sample, while 5% are equally involved as furniture designers, experts in heritage preservation, and sales executives.

The rest of surveyed women of 6% stated that they undertake other allied jobs to architecture, as follows:

- Real estate developer,
- Technical consultant in a governmental administration,
- Façade expert,
- Cost estimator,
- Software instructor,
- Specialist in hospital design,
- Manager of a construction company,
- Manager of a recycling company,
- Owner of a decoration accessories business,
- Owner of a pastry business,
- Fashion designer,
- Artist,
- Graphic designer,

- Online marketer,
- Event planner,
- Journalist,
- Specialist in solar energy systems.

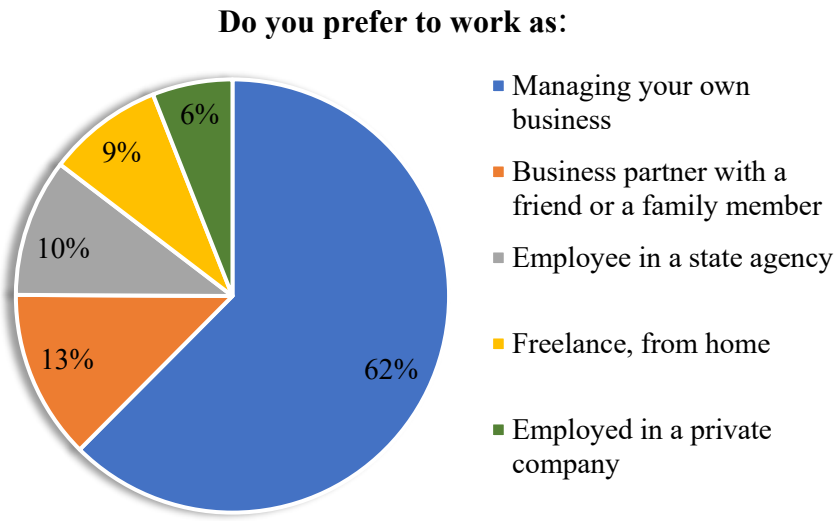



**Fig. 7:** Employment preferences.
Source: Author.

Regarding work preferences (Fig. 7), around 65% of the surveyed group prefer indoor office work, while 35% prefer construction site supervision. As for employment preferences, 62% said they prefer to manage their own business, 13% would instead run a business with an associate such as a friend or a family relative, 10% chose to work as employees in the public sector, 9% would work as freelancers from home, and 6% chose to be employed in a private sector.

**Barriers to Profession**

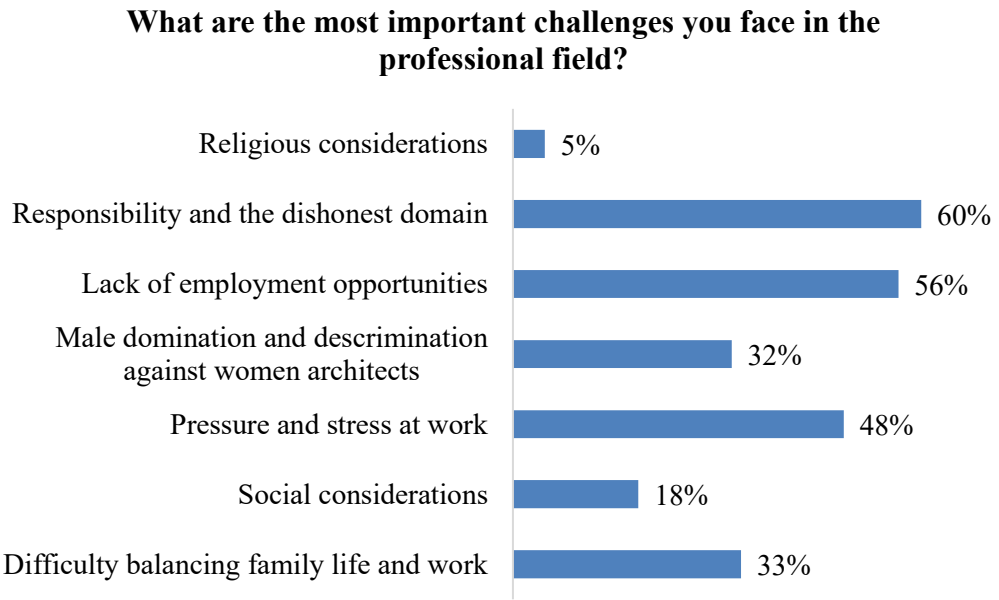



**Fig. 8:** Main challenges faced by women architects.
Source: Author.

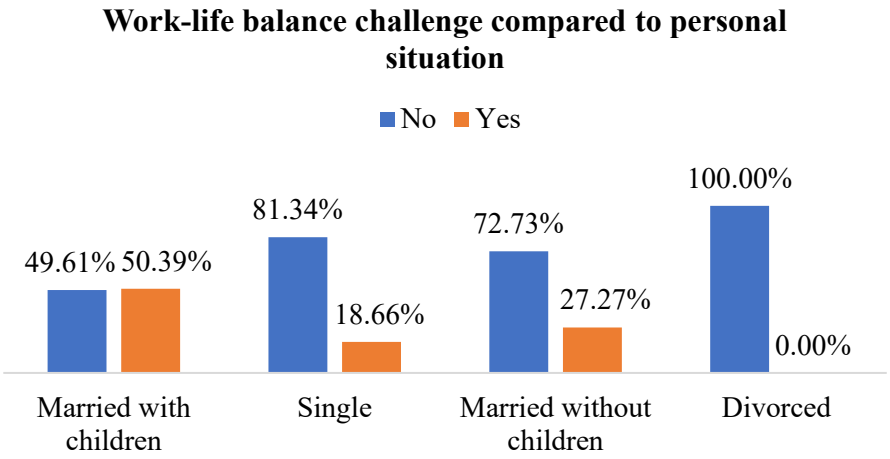



**Fig. 9:** Crossing the variable of personal situation with work-life balance challenge. Source: Author.

The surveyed architects encounter many obstacles in seeking a job related to the profession (Fig. 8). The most critical one is the architect's accountability. Nearly 60% agree that architects' missions are challenging, especially regarding the risks of corruption and fraud that may occur in all project stages. The second main challenge, agreed by 56% of the surveyed women architects, is unpredictability due to the frequent crisis in job opportunities and the difficulty in getting projects. The third main challenge is the high levels of pressure and stress at work, as 48% of the surveyed people expressed.

Nearly a third (33%) stated difficulties in achieving work-life balance. Comparing participants' answers to work-life balance with their marital status (Fig. 9) shows that half of them are married women with kids.

Another third (32%) regards that the domination of men in the professional field would lead to discrimination against women. In a lesser impact, 18% consider social pressure, while only 5% think that religious considerations interfere with their work being female. A participant expressed such factors:

> "As a single young woman, my family prevents me from working in construction site supervision, which causes neighbors' gossip. I am only allowed to work in the office. Moreover, giving orders to construction workers by a young woman is somehow unacceptable".

Regarding the relationships with men, 71.7% of participants find that their colleagues and teams respect their decisions and suggestions. However, the percentage falls to 67.3% when it is related to clients' appreciation of their work.

In some open responses, women are concerned with incorrect practices that make the professional environment unhealthy. These were expressions in statements such as follows:

> "Fraud and corruption to win new projects must be stopped,' 'Salaries are meagre,' 'professional jealousy by male architects,' and 'Intellectual abilities of women architects are underestimated" are cases in point.

**Lacking skills**

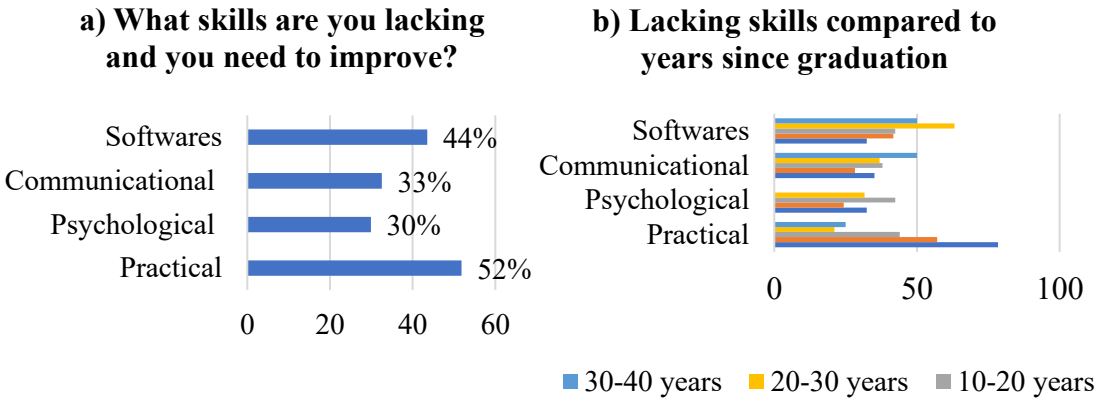



**Fig. 10:** a) Main lacking skills ©Author, b) Main lacking skills compared to years since graduation in percentage= (lacking skill/number each category) *100 ©Author.

In terms of proficiency, the study asked participants about the most professional skills they lacked (Fig. 10). 52% of the surveyed women think that practical knowledge related to administrative procedures, construction-site management, and building materials costs are the skills that participants miss the most. In addition, 44% assume needing more computer skills, especially in designing and building software programs, while 33% need to improve their communication skills with clients besides enlarging their professional network. Another concern of 30% of the surveyed women is psychological stress control and self-confidence skills.

The four aspects of skills lacking due to graduation are addressed together (Fig. 10). Regarding the lack of practical skills, it concerns 78% of female architects with 0-3 years since graduation and 57% of participants with 3-10 years since graduation. Concerning software skills, weakness is felt by 63% of participants with 20-30 years since graduation and 50% in the 30-40 years category. Communication skills are required by 50 % of women having a long experience (30-40 years), while the need for psychological skills that enable women to overcome sensitive issues is expressed by 42% of participants having 10-20 years of experience.

**Ways of Empowerment**

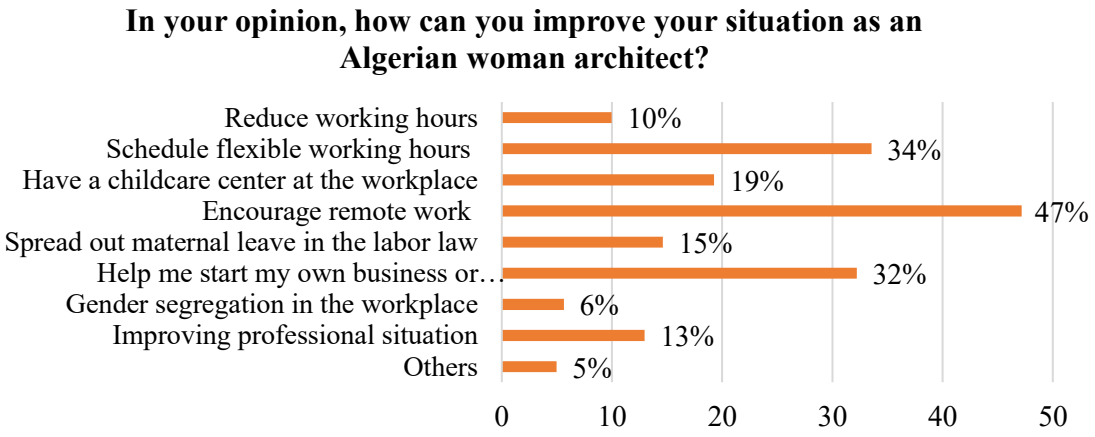



**Fig. 11:** Possible ways of empowerment.
Source: Author.

In a futurist vision, the survey focused on improving the abilities and competencies of the Algerian women architects, as shown in the Fig. 11. While 47% favor promoting working from home, 32% ask for support to create their own business. In maintaining the balance between home duties and jobs, 33% advocate flexible work hours and more tolerance regarding women's lifestyle, within which 19% think that integrating kindergarten services next to workplaces will help them ensure their caring responsibilities. Maternity leave concerns only 15% of women who suggest increasing its duration, that is 14 weeks according to the Algerian law (Ministère du Travail de l'Emploi et de la Sécurité Sociale 2023). A small proportion of women, 6%, ask for gender separation in the workplace. A small segment of 13% also think that improving the profession's general situation will favor both genders regarding improving integrity and fighting against corruption. In the same trend, it is thought that applying laws that enhancing architects' economic situation (i.e., tax reduction, regulating prices, and eliminating the system of the lowest bidder in architectural competitions) and ensuring equal chances for all architects to have job opportunities would also help women.

## Discussion

This article aims to understand the paradox of the high presence of females in higher education in the field of architecture (64.25%) versus their meagre existence in the accreditation board and profession (23.9%). As a general phenomenon, Memaï, et al (2017) stress the rising trend of females in all educational stages in Algeria and the decline in the percentages of male students. Many reasons are attributed to this discrepancy. Firstly, the continuous change in the society favors girls attending universities. Secondly, some cultural models that imply more discipline, order, and restrictions to girls and lesser boys push females to become better students. Thirdly, away from old social practices, the delay in the average marriage age for women and the first child age, estimated to be 30 years and 31.8 years in 2015, respectively, is being increasingly accepted (Memaï, Benloucif & Rouag 2017).

The data collected from the National Board shows that today's accredited women architects are still a minority, and that architecture is still a male-dominated domain in Algeria. However, the gap between the two genders is getting narrower, as shown in the Fig. 4. With more female graduates from architectural schools, the feminization of the profession is expected to rise and reach the same trend as in other countries (Petrescu *et al.* 2015; Mirza & Nacey Research 2022).

According to the online survey, three main factors were identified. First, not all women architects seek accreditation as they work in other domains allied with architecture and construction. Second, external barriers constraining women and leading to dropout still exist. Third, lacking skills that go back to the educational stem or are intrinsic hinders some women architects from finding their way to a career in architecture.

The surveyed women identified several discontents, including the heavy responsibilities that characterise architecture and construction. However, some reasons, such as bureaucratic hurdles, illegal sub-contractor practices, low wages, and unlawful site construction practices, are general and are found not to relate to gender, as mentioned by Möller, Dupré & Fernando (2022). Economic downturns in the construction sector were also a significant concern, making it difficult for women to find jobs in the field. To improve the situation for all architects, participants suggested measures such as improving integrity and fighting against corruption, applying laws that enhance architects' economic situation, and creating more job opportunities that ensure equal chances for everyone.

Regarding outdoor practice and site supervision, most of the surveyed women (65%) prefer working indoors rather than on construction sites. Climatic agents that need physical resistance and the domination of men in the construction site works amplify the latent discrimination against women. Additionally, women architects are culturally discouraged from leading construction sites. Often, construction workers do not accept being supervised by a woman, which is an issue that also exists in other countries (Spaeth & Kosmala 2012; Pickerill 2015).

Regarding other challenges, 48% of participants suffer from pressure and stress at work, and 33% add work-life balance as another burden, especially for married women. The demanding conditions of employment and the long-time hours' practices, especially in the private sector, are not in congruence with the classical roles of women as care providers. In this case, seeking flexible working patterns is a primary concern for women. Similar findings are reported by Amaratunga et al. (2008), Smitheram and Nakai Kidd (2020), Aydın and Erbil (2022a) and Caven (2006). In seeking the desired balance, half of the participants prefer working remotely from home, while another third advocate more tolerance regarding women's lifestyles, mainly by allowing flexible work hours and providing approximate maternity facilities at work (Sandberg 2013: 7-9).

The development of information and communication technologies (ICTs) has led to a significant adoption of remote work in the architectural profession over the past ten years. The ICTs reduce the need for displacements and trip time to work and the workplace. Small wages that replace regular salaries and intermittent jobs also favor women with home duties. However, as Collins *et al.* (2020) found, the blurred boundaries between personal and professional life at home can also be challenging, potentially increasing the workload and stress levels. Therefore, it is essential to consider appropriate workplace policies and home measures while working remotely.

In the case of Algeria, practicing architecture as a remote work still needs to be questioned considering the present technologic context. It has yet to join the global digitalization trend in the construction industry, requiring more mental skills than physical-brute strength (Amaratunga *et al.* 2008). Major reforms in regulations are required for remote work to be recognized. Optimistically, the irreversible technological advancement would open new perspectives to women architects.

The second factor that constrains women architects is intrinsic. In investigating the educational shortages, 52% of the surveyed women think that practical knowledge related to administrative procedures, construction-site management, and costs of building materials are the skills they miss the most. This shortage, which also applies to males, is probably due to needing more training during the educational process.

The lack of communication and psychological skills is considered an essential handicap by a third of surveyed women. Soft skills, such as effective communication in architecture, involve working with clients, stakeholders, construction workers, and other professionals to bring a project to fruition. According to Sandberg (2013), women must learn negotiation to become better appreciated and awarded for their efforts. Psychological skills such as self-confidence, coping with stress, and leadership are also essential in architecture. As women may struggle to develop these skills compared to men (Matud 2004; Wilkinson & Rose 2022), they need to be aware of these potential barriers and seek resources and training to overcome their shortcomings.

Aside from recruitment and hiring in either public or private sectors, 62% of participants consider that managing one's business and undertaking entrepreneurship is an alternative that favors women in architecture. Sang et al.(2009) report that self-employed architects have better job satisfaction thanks to flexible working hours, a sense of freedom, and control over their working life. Nevertheless, managing one's business requires other skills: heading employees (Caven 2006). This alternative is, thus, most convenient to experienced women rather than fresh graduates (Fig. 10), who must go through the long training pipeline. Tendering for projects with older firms and other competitive consultants is very challenging.

Alternatives to classical consultancy are also available in other allied fields, to architecture and construction. As a multidisciplinary field, architecture provides many hidden skills that ensure the well-being of women and an innovative solution (Tancred, Peta & Adams 2000; Caven 2006; Sang, Ison & Dainty 2009; Möller, Dupré & Fernando 2022).

## Conclusions

This study highlights women's paradoxical presence in architecture departments and in the architecture profession in Algeria, a dialectic phenomenon that is also reflected in the

international scene. It confronts the large percentages of female graduates from the university with their limited presence in the National Accreditation Board. Even though the gap between men and women, during the last decade, is narrowing, the low presence of women in the listed architects' practices is still noticeable.

Many reasons explain this state. It is evident that many women drop off from the profession due to external constraints. Another segment of graduate women is absorbed by the allied fields and thus are not registered. Regarding competencies and required aptitudes, some women architects need to gain key practical skills that hinder them from practising the profession.

The heavy duties of the architect in the construction sector is considered as the most significant challenge. The stressful nature of the architect's work and its time-consuming character are other barriers that some women face in achieving a work-life balance. The male-dominated environment that sometimes generates discrimination also is regarded as a barrier.

Two perspectives can be considered concerning women architects; the increasing shift to remote working that allows more flexible routines in workplaces and timing provides many promising opportunities for women architects in practising the profession. The gradual introduction of communication and collaborative technologies in the construction domain may change the work traditions in favor of women architects. These perspectives hold potential to reshape the future of the architectural profession and impact the managerial aspects of the construction industry.

One of the limits of this study is its reliance on a few accessible sources based on personal relationships that could undermine its absolute validity. Only some universities agreed to provide archival and non-published information. Data on other universities are mostly to corroborate the collected statistics. Similarly, the accurate number of women practicing architects, both with and without accreditation, is also not publicly available in Algeria, as is elsewhere. Additional research may refine and enlarge the data collection for women architects occupying governmental positions and working at higher-educational institutions. Last, the survey would be finetuned if male architects' opinions on the female presence and performance at work are included.

Finally, findings of the study mostly rely on the statistics from Algeria that share many cultural and socio-cultural characteristics with other North African countries. Its generalizability may also extend to most other Arab countries in which universities are witnessing an ever-growing number of women at the universities.

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## Disclosure Statement

We declare that we have no conflicts of interest to disclose. We have seen and agree with the manuscript's contents, and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

## Data Availability Statement

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

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