

## Article

# Gender Equality in Architecture and Construction: An Assessment Framework at the Institutional and Sectoral Levels in Jordan

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**Abstract:** The issue of gender equality demands attention from governments, policymakers, and the community at large. It requires continuous redefinition due to its complex technical, professional, economic, and social dimensions, all aimed at empowering women to claim their position within society. Jordan is no exception to this, as women encounter numerous hurdles in accessing equal opportunities in the professional sphere despite their increasing levels of education. This underscores the necessity for a thorough examination of the factors influencing this discussion. This research is targeted at identifying and categorising relevant gender equality indicators within the architectural practice in Jordan, as part of the construction sector. This research adopts a quantitative approach, utilising the Delphi Technique and Analytical Hierarchy Process through engagement with experts from academia and practice to ensure appropriate sourcing, filtration, and rating of the most relevant indicators. It concludes with the identification of fifty-nine indicators grouped into the categories of Education, Employability, Enablement, Inclusion, Professionalism, Facilitation, and Support. This research reveals a higher emphasis on the practical aspects of gender equality by the participants, prioritising particular categories and indicators. The findings offer essential insights to effectively address such an important issue across the policy, economic, social, and professional levels.

**Keywords:** gender equality; architecture; construction; indicators; barriers; analytical hierarchy process; Delphi Technique



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## 1. Introduction

Gender equality is a multifaceted concern. It can be observed from different perspectives, including the legal, social, professional, economic, or educational stance, amongst others [1]. Irrespective of the perspective, the issue has acquired global undivided attention where, according to the Organisation for Economic Co-operation and Development (OECD), women are not provided with adequate opportunities in economic activities compared to men [2]. Despite the increasing number of university applicants and graduates in all fields, women are yet to be afforded the same access and support in the professional work domain as men, which highlights a discerning gap between education and employment [3]. This is particularly apparent in the majority of countries in the MENA (Middle East and North Africa) region, which lie at the bottom of the gender gap index with regard to economic opportunities but are far better ranked in educational attainment, covering literacy rate, tertiary education, and university graduates [4]. The harsh reality is not limited

to the number of women in employment, but also the quality of jobs and tasks, where women are more likely to work in clerical and support jobs compared to more technical and managerial roles [2].

Gender equality may be intrinsic to a multiplicity of underlying considerations, including the political regime, societal stereotypes, family norms, work practices, and many other influencers or obstacles [5]. Given that the architectural practice falls within the construction industry, a male-dominant sector by definition, the situation becomes increasingly more complicated. Historically, women have struggled to gain their rightful stature in the architectural community. While the renowned architects were primarily dominated by men, women have gradually forced their way into the spotlight despite the multiple challenges faced. Examples of prominent female architects include Louise Blanchard Bethune; the first woman member in the American Institute of Architects in 1891, Norma Merrick; the first African American woman architect, Marion Mahony Griffin with the design of the capital city of Canberra; and Ada Bursi and Edith Girard with their work on low-cost housing. Considering prominent women figures originally from the region, Zaha Hadid, the British–Iraqi architect, is the most well-known, as she became the first female architect awarded with the Pritzker prize in 2004 [6]. In Jordan’s higher education, the discipline of architecture has acquired increasing attention from females, reflected by a higher enrolment and graduation rate. A study by Bataineh et al. [7] in one of the prominent Jordanian universities showed that, while males were more dominant in engineering studies in general, females assumed the higher share of architectural engineering graduates. This reflects an increasing interest rate of women in the architectural field.

The perception of the architectural profession is often shaped by the educational credentials of individuals, as well as their personal abilities, skills, and attributes that delineate their associated responsibilities. These aspects occasionally extend beyond individual qualities to encompass the architectural firm and its organisational structure. Factors such as working conditions, equitable treatment, and the level of communication and collaboration among colleagues also contribute significantly to this perception. Such a multi-layered reality mandates that any study aimed at unpacking the most influential indicators of gender equality in architecture should entail a multi-level exploration of influential factors on the country, sector, and institutional levels. Thus, this was set as the aim of this study, which combined the views of experts from academic and professional fields to effectively source, filter, and rank indicators on different scales to ensure their relevance to the concerned industry as well as the local Jordanian context.

### *1.1. Gender Equality in Architecture and Construction*

Gender equality assumes higher levels of importance and urgency in construction and, in association, architecture, where the apparent gender inequalities in both fields are almost consistent among different countries and cultures, with women being the subject of extreme under-representation [8,9]. Indeed, the construction industry has been branded as one that is often gender insensitive, rendering the issues of gender inequality even more profound. When it comes to this sector, legislation remains of limited influence when it comes to protecting the rightful share of women in employment [10]. According to Bagilhole et al. [11], the subjectively skewed stance towards women in the construction industry is alarming, where their lack of acceptance and admission into skilled professions within the industry is quite evident.

Architecture is often considered a masculine trade [12]. Even in the most developed nations, with the US and UK taken as examples, the parity between women architects (by education) and practicing architects (by registration) is evident, with an average contribution of 15–20% of the total workforce in the profession [5,13]. A key area of concern is that, despite the growing numbers of women in architectural professions, the gap is hard to bridge, as men keep outnumbering women, globally [14]. A study by de Graft-Johnson et al. [15] highlighted that, although the enrolment of women into architectural schools is increasing, their inclusion in the relevant professional workforce remains modest. This

concern is exacerbated by men being claimed to consistently practice multiple forms of oppression and discrimination against women in the workplace, where women's response remains bound to acts of coping [16].

Generally, women have repeatedly been viewed as the victims of male dominance in the construction and architectural fields, with targeted acts of inclusive hiring, promotion, and general conduct within the relevant organisations [17]. Generally, the profession of engineering has for long been branded with the highest levels of masculinity [18]. Engineers are ones characterised by a strong physical ability to succeed in tough and challenging work environments [10,19]. Stemming from such a perspective, women are expected to work and settle in areas such as administrative or general support compared to the more technical professions within organisations, a perspective that is at least considered detrimental to their capabilities and traits [20]. Women are yet to break the hidden barriers that branded and "womanised" the scope of work they were allowed into, with clerical and secretarial tasks being seen as most suited to their capabilities [21].

It is quite surprising how such a critical concern is left unaddressed, not only in light of the detrimental effects of prolonging gender inequality, but also the advantages that may be achieved through more gender diversity in the construction and architectural fields. It has been well documented that men and women maintain different stances on environmental, economic, and social issues [22], where such differences provide promise in achieving a balanced approach towards addressing such challenges. Economically, it has been evident that companies with higher gender diversity enjoy improved profitability [23]. The availability of more women as part of the executive teams resulted in general improvements, where such diversity produces team cohesion, self-confidence, balanced decision making, and lower employee turnover rates. Environmentally, women are seen as stronger supporters of the general cause through their participation in activities, social work, and votes [22,24]. Such endless support for environmental concerns and their resolution stems from the differences women demonstrate, as compared to men, regarding character, behaviour, and understanding [14]. Architecturally, consciousness of environmental issues is more manifested in the designs of women, where their average footprint is considerably less.

### *1.2. Gender Equality: Barriers and Indicators*

Gender equality captured attention in Europe in the 1980s, when the first known policies for gender equality were forged. These policies entailed measurements to establish equality, primarily in terms of regulation and work opportunities. Further policies evolved to emphasise the right of women in quality jobs and roles in decision making, followed by a more socialised construct of gender equality, where the integration of women into societal relations, reflective of potential gender violence, was emphasised [25,26]. Still, despite the advancement of policies and measures over time, it is still argued that they failed to properly target the effective inclusion of women into male-dominated environments [27].

Gender equality measures are mostly ineffective when their primary target is to ensure the mere presence of women in the different addressable domains, as true equality entails aspects that are not straightforward to measure [28]. They, on the contrary, entail multiple complexities pertaining to how gender difference affects the progress of women in the academic and professional domains, economically, technically, and socially. The indirect consequences of opposing actions could result in their exclusion or oppression through persistent toxic internal and external relations [29]. This is exacerbated by the fact that gender inequality is commonly driven by the roles and attitudes assigned to each gender by prevalent societal norms. Gender equality, or inequality in this case, should reflect the comparative reality between men and women in all aspects of life [30]. This emphasises the importance of maintaining a current set of indicators that are able to explore such a pivotal matter affecting the advancement of gender within the society. On a national scale, indeed, attempts to assimilate gender equality indicators have relied on identifying barriers that hinder the career development and progress of women, calling for intervention to ensure their resolution, rendering the different working domains more equitable [31].

The construction industry has been the subject of studies aimed at identifying the barriers faced by working women. Such attempts, however, are found lacking in terms of consistency and contextual relevance. Women architects, being a part of such an industry, face multiple barriers within the over-masculine work environment, which hinders their full participation in the labour market. Caven and Astor's [32] work is an example, where women were found to face multiple challenges in such a complex and layered manner. The challenges combined direct barriers, such as physical site visits, worker management, and lack of valid policies governing gender equality. The indirect less-measurable barriers include aggressive behaviour against women, community stereotypes, work-family balance of responsibilities, and the lack of interest by employers in creating a welcoming work environment. Such a mix of evident and hidden obstacles participates in forming the conviction of working women as ones that work fewer hours and earn less compared to their male counterparts.

Gender equality indicators can be sourced quantitatively or qualitatively, where the former is focused on quantifiable results of countable aspects. This includes matters such as percentages of education, differences in wage, or average age upon marriage. The latter, on the other hand, focuses more on opinions, feelings, and attitudes, descriptive of matters such as constraints, advantages, and disadvantages of the work environment. They are usually sought through participatory approaches, focus groups, or object-specific detailed surveys [33].

### *1.3. Gender Equality Indicators in the Literature*

Going through the relevant literature on the topic, gender equality appears as a topic that has grown in terms of level of attention, with comprehensive indicators being proposed, devised, and refined. A review of the literature further reveals the diversity of such indicators, which is indicative of the different domains they tackle. The literature sources can be classified, in terms of their areas of focus, into two categories: international organisational bodies and independent, more specialised associations and researchers. The former tends to focus on areas that generically touch upon gender equality, whereas the latter identifies more specific indicators that are seen closer to the professional domain, be it in architecture or construction (refer to Table S1 in the Supplementary Material).

The organisational bodies covered by the review included publications from the likes of the United Development Programme (UNDP) [34], World Economic Forum [4], the United Nation's Economic and Social Commission for West Asia (ESCWA) [35], World Bank [36], and the European Institute for Gender Equality (EIGE) [26]. Such organisations were found to focus on the indicators that emphasised women's inclusion in education (particularly tertiary), literacy rates, participation in decision making, share in the workforce, wage inequalities, gender violence, and maternity arrangements. Moderate attention is provided to indicators such as training and upskilling, graduates of engineering disciplines, the share of professional and technical jobs, self-employment and entrepreneurship, participation in politics and associations, as well as merit-based recruitment. The attention of these organisations is found lacking to indicators pertaining to the subjects of engineering certification, family support, cultural stereotypes, work environment, mentorships, rewards, performance standards, and work-life balance. From that perspective, governmental bodies reveal a focus on quantitative indicators that highlight the realities of gender equality on the macro, nationwide level.

A review of the literature pertaining to the specialised associations and researchers, on the other hand, revealed more focus on qualitative indicators, which rendered a general discrepancy between both views. The most recurring indicators included the cultural outlook of the role of women within the community, belief in fitness to work requirements, advancement opportunities, inter-communication between colleagues, flexible working times, and work-life balance. These indicators were most present in the works of Navarro-Astor et al. [37], Shugoll Research [38], RIBA [13], IUA [39], Guney and Koksall [40], Astor et al. [37], and Tapia et al. [41]. Less-addressed indicators included upskilling and training,

family support, percentage in managerial positions, work environment, working women architects, performance standards, work content, working hours, policies on gender violence, maternity leave, and work availability after long leaves. These were featured in the works of Niemann et al. [42], AIA [43], Chatterji [44], Barreto et al. [45], and de Graft-Johnson et al. [15].

## 2. Materials and Methods

This research combines qualitative and quantitative approaches to explore the issue of gender equality to identify the relevant indicators impacting women in architecture pertaining to a Jordanian context. It involved multiple stakeholders to advise on the identification, filtration, and prioritisation of a long list of relevant indicators sourced through a thorough literature review, categorising them, and rating their importance level. The participants' feedback included qualitative insights sought through casual discussions and interviews, followed by questionnaires to provide quantitative insights through the use of the Delphi approach as well as the Analytical Hierarchy Process (AHP).

### 2.1. Desk and Qualitative Research

The research started with several informal conversations and interviews aimed at highlighting the key areas of interest to guide the barriers and indicators of the research process. It included conversations with several experts from academia, practice, and governmental entities to collect a balanced set of perspectives. This was followed by an extensive review of the current literature, including online publications, books, and journal papers issued by international organisations, specialised associations, key architectural firms, as well as individual authors. A long list of indicators was identified, as shown in Table S2 (refer to the Supplementary Material), that was used as a starting point for further investigation, filtering, and refinement. The combination of sources ensured that the assimilated barriers and indicators would represent a multi-scalar view of the issue at hand on both the macro and micro levels.

To organise the long list of indicators obtained through desk research, they were grouped into a number of categories, namely:

- Education, which is aimed at highlighting the level at which women are educationally equipped to effectively participate in the general and specialised fields of education. This category combined indicators that addressed the level of literacy, university degrees and relevance, and educational pursuit in the architectural field, amongst others.
- Employability, which is aimed at clarifying the enablers, or barriers, women face in the labour market in a manner that would support or hinder their level of engagement. This category included indicators on the share of general and specialised workforces, engineering certification, unemployment rates, and cultural and societal stereotypes.
- Enablement, which comprised indicators that highlighted the diversified levels of support women receive to properly engage in the education and employment domains. This included indicators on training and upskilling, mentorship, decision making, employment levels, and criticality of work assignments.
- Inclusion, which aimed at identifying the levels at which women were welcomed within the work environment. This included indicators about public/private employment, involvement in technical tasks, full-time/part-time/self-employment, attrition rates, profession change, tenure, and protective laws and regulations.
- Professionalism, which is aimed at identifying the level of professional treatment expected at the workplace and the community at large for women. This included indicators about performance and promotion criteria, rewards, wage gaps, and posts and responsibility distribution.
- Protection, which aimed at identifying the internal and external protection mechanisms for women to assume their right to equal treatment concerning matters that might otherwise support a more masculine work environment. This category included indicators on policies and guidelines, gender violence and harassment, freedom of movement, working hours, flexibility, and maternity leave.

- Support, which aimed to summarise the auxiliary support mechanisms (internal and external) that would enhance the level of gender equality. This included indicators related to legislative seats, positions in professional associations, early marriages, and share of domestic responsibility, socially and financially.

## 2.2. The Delphi Technique

Having the long list of grouped barriers and indicators, they needed to be validated, filtered, and organised to establish a potential assessment framework. This was achieved through a two-round Delphi approach that included a group of experts combining members of academia, practitioners, as well as governmental officials. The Delphi approach was seen as an ideal method for its ability to accumulate the knowledge of experts to support a consistent decision-making process. It results in the selection and prioritisation of the components of a multi-faceted issue by obtaining their consensus quantitatively [46]. It is considered a team effort, entailing individuals with profound knowledge on the issue [47]. For that purpose, Delphi rounds customarily gather a group of experts (academics, government, and professional specialists) who share opinions by addressing inquiries provided through questionnaires [48].

This research combined a diversified base of experts, combining academic, regulatory, and practical expertise. This was driven by the multi-faceted nature of the topic of gender equality, where its true achievement is a matter that requires the synchronisation of support channels and reforms that span these domains. Table 1 demonstrates the distribution of the extensive panel of 48 experts involved in the process. A non-random selection was utilised to source the experts, considering their specialty and relevant experience [49] in the Jordanian architectural and construction sector. Further participants were sourced through snowballing (colleagues, co-workers, fellow scholars, etc.) The resultant expert base reflected a balanced distribution between males and females among different backgrounds, as well as years of experience, which reflected a level of stability within the working environment in a manner that suitably positioned the participants to identify, or sometimes experience, the barriers to gender equality. The distributed questionnaires collected participant views about the organisation, categorisation, and selection of indicators proposed for consideration.

**Table 1.** Distribution of the expert panel members.

Experts Sample Distribution			
Gender	Male	Female	Undeclared
	22	26	-
Background	Academia	Practice	Government
	18	20	10
Educational Level	Graduate	Post Graduate	
	32	16	
Sector of expertise	16 Male	6 Male	
	12 Female	10 Female	
	Public	Private	Other
	17	26	5
Years of experience	Below 5	5–10	Above 10
	8	22	18

The first and second Delphi rounds involved the selected experts to qualify, add, or remove categories and indicators based on how they viewed their relevance and importance. This relied on knowledge and subject matter expertise with an understanding of the local context. The framework was accordingly refined and returned to the experts for validation and comment. This approach enabled the integration of expert views representing different backgrounds and expertise. The shared opinions and recommendations helped elaborate on the level of consensus reflected across the experts, where collective views could be identified while eliminating possible outliers. The first stage Delphi included 48 experts

invited, from whom 43 experts responded in the first round (equating to an 89.6% response rate) and 39 in the second (81.3%).

### 2.3. Analytic Hierarchy Process (AHP)

AHP is a multi-criteria decision-making tool originally developed by Thomas Saaty, which grew to become among the most prominent decision-making support approaches. It primarily aims at quantitatively breaking down a complex issue through conducting paired comparisons consisting of a multiplicity of aspects, resulting in relative priorities and weights [49]. AHP is a structured, multi-attribute decision-making method, and is ideally suited due to the complexity of the indicators in this research.

The considered categories and indicators went through paired comparisons, where the relative importance of each was weighed through a square matrix utilising Saaty's nine-point scale system [50]. The rating scale ranges from 1, for the equal weight of the two compared aspects, to 9, representing the highest level of importance of the considered aspect [51] (see Figure 1). Once the paired comparisons are completed for all categories and indicators, their relative weights can be obtained by summing the total points each achieved over the cumulative points.

Factor	More Importance								Eq	Less Importance								Factor
Fac1	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Fac2
Fac1	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Fac3
Fac1	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Fac4
Fac1	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Fac5
Fac1	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	....

  

Factor	F1	F2	F3	F4	F5	...
Fac1		4	8	1/3	7	1
Fac2						
Fac3						
Fac4						
Fac5						
Fac6						

Figure 1. Paired comparisons.

To ensure the consistency of the obtained results, the consistency ratio (CR) was calculated. With such human influence over the outcomes, accuracy, and consistency were validated, where the CR value did not exceed 0.1 [50]. The consistency ratio is calculated through the following equation:

$$CR = CI/RCI,$$

where

$$CI = \lambda_{\max} - n/n - 1$$

CI: the level of consistency

$\lambda_{\max}$ : the maximum eigenvalue of the matrix

RCI: a random consistency index taken according to the number of factors.

### 3. Results and Discussion

The findings were arranged to demonstrate the varying emphasis provided on the categories, followed by the detailed weights of indicators included in each category. They combined the filtration outcomes obtained from the Delphi rounds, followed by the assignment of weights as a result of the AHP exercise that followed. Qualitative remarks were received from the participants, and alignment of earlier studies was included for relevance of the obtained data.

### 3.1. Categorical Outcomes

The Delphi rounds started with a long list of indicators distributed over the identified categories (Table S2 in the Supplementary Material). The participating experts were consulted and provided their opinions on the relevance of the proposed indicators, their relative level of importance, and also the need to add, remove, or merge some indicators or relocate any across the proposed categories. The views of the participants, although received individually, were agglomerated to identify the most recurring thoughts and recommendations. The initial outcomes were used to refine the original categorised indicators. It was later presented for the views of the participants in the second Delphi round, where a consensus was sought to confirm the outcomes ahead of assigning them weights through AHP.

According to the feedback of the participants throughout the Delphi rounds, the selected categories (Education, Employability, Enablement, Inclusion, Professionalism, Protection, and Support) were seen as generally adequate. No significant concerns were expressed on the concept or necessity of each category, except for the request to change the name of the Protection category to become "Facilitation". The reason provided by the experts was that such a name would better suit the purpose of the included indicators and shed positivity on the matter. The proposed renaming stemmed from the need to use more neutral wordings, where the original use of "Protection" would show some subjectivity, if not negativity, into the topic of gender equality. "Positively speaking, women are not weak members of society that need to be protected, but active contributors, whose added value and potential need to be facilitated to be better demonstrated", said one of the participants.

When comparing the weights assigned to each category, the outcomes of AHP revealed a rather levelled weight distribution that highlighted the emphasis of certain categories over others (Table 2). Inclusion and Enablement were ranked at the top (23.1 and 22.4%, respectively), Employability (16.8%), Education (12.8%), and Professionalism (12.7%) were ranked in the middle, while Support (6.4%) and Facilitation (5.8%) were ranked the lowest. Such an arrangement revealed a notion maintained by experts, potentially reflective of the general view, concerning gender equality within the Jordanian context. The value of women as active participants in contributing to the architectural business was highly prioritised, which reflected more focus on practical contribution compared to traits related to education or employability. The more externalised factors of facilitation and support were seen as relatively less influential, as they were seen as indicative of a less empowering perspective. "Women already have the potential and requirements to contribute, it is a matter of ensuring the readiness of the workplace to treat them equally and fairly", one of the participants commented, indicating the importance of the Enablement and Inclusion categories, as they would mostly enhance the acceptance and sense of belonging to women in their workplaces. Some participants referred to the middle ranking of education to its general advancement in Jordan, where women were not short of achievement in that area compared to men. Indeed, recent statistics have shown that Jordan has achieved a better standing concerning gender equality in education (with a score of 0.994), where the contribution of women (as applicants as well as graduates) even surpasses their male counterparts. Despite that, Jordan attains a lower ranking within the global gender gap index, with a score of 0.542 [4].

**Table 2.** Weight distribution of the indicator categories.

#	Category	Weight (%)
1	Education	12.8%
2	Employability	16.8%
3	Enablement	22.4%
4	Inclusion	23.1%
5	Professionalism	12.7%
6	Facilitation	5.8%
7	Support	6.4%

### 3.2. Education Category

Participants demonstrated a moderate level of support for the indicators in this category. The relatively modest level of endorsement can be attributed to several factors. Firstly, many experts, including academics, adopted a practical stance regarding the contribution of these indicators to ensuring the eventual and equitable involvement of women in architecture, a field inherently rooted in practicality. Secondly, and as a matter of context, the openness and fairness of educational opportunities between men and women was not seen as a recurring issue in Jordan, in consideration of its relative advancement in the area, as stated earlier. One of the participants stated that the issue is not with the number of graduates or applicants in the domain of architecture while emphasising the need to maintain an adequate and continuous inflow into the market. The pressing issue is where such graduates would be hosted, and supported, upon entering the labour market.

With regard to the particular indicators (Table 3), the totals and proportions of female applicants (19.7%) and graduates with architectural degrees (20.7%) were amongst the highest supported indicators, along with mean scores of mathematics and science subjects achieved in secondary school (21.8%). This was justified by some of the participants as the most relevant to the preparedness of architects for joining the professional world of architecture, whether in terms of degree or academic skills, which would support their competitiveness in selection to open posts in the domain. The factors achieving a moderate rating included the totals and proportion of females changing their university specialty from architecture to other disciplines (9.2%), the total and share of women completing tertiary education (11.2%), and the totals and share of female researchers (6.6%). These indicators, according to some of the participants, were indicative of the level of attachment and dedication to the architectural field, a trait appreciated in the selection and retention of candidates. Yet, they were mainly seen as enablers to enhance the opportunities of women in the architectural domain, considering their competitiveness, where the earlier, higher-ranked indicators would better secure their entry point into employment. Totals and proportion of literate women (3.8%) or completing secondary education (4.4%) were weighed the least, partly due to the relatively high literacy and educational rate in Jordan. In consideration of the recurring opinions of the participants, the totals and proportion of female applicants to architectural certification was considered the least relevant compared to the other factors, and was consequently removed from the suggested framework. This was quite an unpredicted outcome, where one would imagine that such certification would be one of the most influential practical enablers to engaging women in the architectural profession. A good number of the participants emphasised that, although certification was an important element, skills and traits of the professionals working in the architectural domain would prove more influential, whereas others referred to the lower weight assigned to this indicator to such certification being more prone to international standards, where the local norms and codes of the profession would have more emphasis within the context of Jordan.

**Table 3.** Weight distribution of the indicators in the Education category.

#	Indicator	Weight (%)
1.1	Total and proportion of female graduates with arch engineering specialisations	20.7%
1.2	Total and proportion of literate women (15–24 years old).	3.8%
1.3	Total and proportion of females changing specialty from architecture to other disciplines	9.2%
1.4	Total and proportion of females completing secondary education	4.4%
1.5	Score mean female secondary school average achieved in mathematics and science subjects compared to males	21.8%
1.6	Total and proportion of female applicants to arch-related engineering certification	2.7%
1.7	Total and proportion of female researchers	6.6%

**Table 3.** *Cont.*

#	Indicator	Weight (%)
1.8	Total and proportion of female applicants to arch engineering degrees	19.7%
1.9	Total and proportion of females completing tertiary education	11.2%

### 3.3. Employability Category

Employability achieved a middle standing amongst the categories. This was stimulated by the relative importance of the matter for ensuring the stronger presence of women in the labour market through the provision of equal, and relevant, employment opportunities. The conducted Delphi rounds confirmed the suggested indicators in this category, with three exceptions. The total and proportion of females in waged employment was removed, as it was seen to be inherently included in the indicator on their presence in the labour market, which was the same reason for removing the total and proportion of working female architects. Both removed indicators were also seen as partially supported by the indicators of the Education category, where the influx of well-educated female architects would provide a base for enhancing their employability. On the other hand, the existence of cultural gender stereotypes within the community was moved from the Employability category, as it was seen as more relevant within the Support category. Many of the participants referred to the importance of including this indicator within the Support category, as it was considered quite a generic aspect that does not only influence the advancement of female architects in the labour market, but all other women seeking employment in the different sectors.

The weighting of the indicators (in terms of importance) in this category revealed that the weight range was relatively closer between the top-ranked indicators compared to the other categories, which was due to the closer interrelations such indicators had with each other (Table 4). Relatively, the indicators receiving higher weights included the total and proportion of female architects working in unrelated fields (25.2%), their share in the labour force (18.9%), level of belief in equality in job opportunities (18.0%), and the belief in equal skills and traits (24.4%). In a sense, the highly ranked indicators aimed at signifying the sense of adequacy maintained by employers when hiring women in the architectural profession, where the conviction of their adequacy to the available posts and their foreseen levels of preparedness and skill were seen of utmost importance. One of the participants said: “you can have as many degrees and certification as you can get, but unless employers believe in the equal capabilities of women, practically, we [women] do not stand much of a chance”. Indeed, Otero-Hermida and Garcia-Melon [52] differentiated indicators reflecting actual performance and perception, which should both be considered in assessing the reality of women’s equitable participation. Among the indicators receiving a lower weight were the total and proportion of unemployed females (6.0%), as well as the total and proportion of registered female architectural engineers in professional associations (7.5%). The lower weight received by the latter indicators was partially referred to the lower impact of trade unions and associations in Jordan, in general, compared to other more developed countries with regard to labour protection, support, and industrial relations.

**Table 4.** Weight distribution of the indicators in the Employability category.

#	Indicator	Weight (%)
2.1	Total and proportion of registered female arch engineers in professional associations	7.5%
2.2	Total and proportion of females in the labour force	18.9%
2.3	Total and proportion of female architects working in unrelated fields	25.2%
2.4	Total and proportion of unemployed females	6.0%
2.5	Level of community belief in equality in job opportunities	18.0%
2.6	Level of community belief in equal skills and traits (personal attribute)	24.4%

### 3.4. Enablement Category

Enablement was among the highest-ranked categories according to the participants. The reality of gender equality in Jordan was seen to be most highly impacted by the implicit factors rather than the explicit: the combination of not-so-clear traits and soft skills of professionals that are usually vaguely probed and appreciated by employers. This is exacerbated by the progressive attitude the government and community demonstrate, partly in support of the country's promotional agenda, which may sometimes result in the less direct tackling of factors that could encourage (or discourage) gender equality. Although the indicators in this category were seen as harder to measure compared to the ones belonging to other categories, almost all of them were seen as relevant and worthy of confirmation, except for the total and share of appointment in position due to capability and fitness to job requirements. This specific indicator was selected for removal for several reasons. Firstly, the issue entails a level of sensitivity between the employer and employee, making it difficult for both parties to maintain objectivity in their opinions regarding appointment decisions. Secondly, such decisions typically rely on performance factors and Key Performance Indicators (KPIs) used to inform appointment decisions, which are primarily tied to work performance. This makes it challenging to measure any underlying motives related to the stance on gender equality held by either the employer or employee. Appointment in position, as endorsed by most labour laws, does not require an officially stated reason, where it is an unconditional right provided to both the employee and employer, which complicates the proper assessment of particular situations and their relevance to gender equal opportunity [53].

With regard to the assigned weights, some key indicators were ranked at the top, where the ranking in between the rest of the indicators shows less variation (Table 5). The leadership privileges assigned to women assumed the highest priority, with the indicators of total and share of females with participation in decision making (19.1%) and their total and share in managerial positions (16.8%), along with the share of emotional/ monetary rewards at the workplace (22.1%). These were followed by the frequency of management actions (empowering females) in the work environment (10.0%), provided training (11.3%), and the availability of cross-gender mentorships (10.7%). Practically, higher weights were given to indicators that relied on the self-initiative as well as assigned self-worth by female architects, where reference was made to the importance of such attributes in enabling women to assume higher roles within their organisations and, accordingly, receive more attractive awards, materially and morally. The total and proportion of women assigned competitive/ skilful assignments (5.5%) and the total and proportion receiving time-critical assignments (4.5%) received lower weights. This gives rise to the overall economic situation in Jordan, where the relatively modest hiring budgets and employee operational costs, in light of the prevailing market economic conditions, restrict the lenient employment of individuals (regardless of gender) to handle less-skilled tasks in a manner that reduces the utilisation of employees. Furthermore, the moderate weight placed on females provided with training indicates the relatively higher level of readiness acquired by university graduates in Jordan, which further supports the overall moderate rating of the Education category in general.

**Table 5.** Weight distribution of the indicators in the Enablement category.

#	Indicator	Weight (%)
3.1	Total and proportion of females in provided training	11.3%
3.2	Availability of cross-gender mentorships	10.7%
3.3	Share of emotional/monetary rewards at the workplace	22.1%
3.4	Frequency of female empowerment actions in the work environment	10.0%
3.5	Total and proportion of females with participation in decision-making	19.1%
3.6	Total and proportion of women in managerial positions	16.8%
3.7	Total and proportion of women assigned competitive/skilful assignments	5.5%
3.8	Total and proportion of women provided time-critical assignments	4.5%

### 3.5. Inclusion Category

The participants highly ranked indicators in the Inclusion category as a result of the embeddedness of gender equality enablers, as mentioned earlier. They, however, were against the inclusion of some indicators within the category, as they were not seen as highly relevant with consideration to the particular context of Jordan. The total and proportion of women in the private sector or large firms were not seen as relevant indicators, considering the excessive particularity they required while considering the rather modest Jordanian economy. The same was advised when removing the total and proportion of women in self/independent employment, where this particular form of economic contribution was not seen as influential in the local context. The removed indicators were left out in favour of more relevant and directly related indicators such as the total and proportion of women in full and part-time employment, for instance, as focusing on such direct indicators promises to provide a more concise understanding of the situation at hand.

When considering the relative weights of the indicators covered by the Inclusion category, the ones pertaining to their representation and employment stability assumed higher weights (Table 6). Indicators such as the total and proportion in full or part-time employment (8.8 and 11.4%, respectively), working in professional and technical jobs (13.7%), and the return after extended leave (13.8%) and the potential of job change in result of that (19.1%) were seen as critical indicators, as they address the common societal notions of women's work being temporary until marriage, or having children at the maximum, where the availability of women for professional duties becomes less on the long term, which would maintain a change dynamic between full and part-time employment. With women being assigned higher leave periods (mainly due to maternity), the quality of their jobs and responsibilities was seen undermined in most cases upon their return to work, where their respective firms would favour a more stable employee. The total and proportion of women leaving their jobs (9.6%), their average retirement age compared to men (7.8%), and the extent of merit-based, gender-neutral recruitment (6.2%) received lower weights. Such relatively lower weights for the first and third indicators were referred to the multiplicity of technical, administrative, and personal reasons and motivators stimulating the entry and exit of employees, where the lower weight provided to the second was attributed to retirement being more of a personal decision that is less indicative of the lack of gender equality at the workplace. The total and proportion of women changing professions before retirement (5.9%) and the impact of female protection laws on their hiring (3.7%) received the lowest weights. The common view in between the participants was in favour of career change being driven by multiple possible factors, most of which would apply to men in a similar fashion to women. Matters such as passion for the job, recurring economic opportunities, and other pressures were seen among such influencers. The impact of female protection laws on their hiring, on the other hand, was not seen of a significant influence due to the laws themselves not being considered strong, where their scope is limited to the basic benefits provided for women at work, with main emphasis on maternity leave [36].

**Table 6.** Weight distribution of the indicators in the Inclusion category.

#	Indicator	Weight (%)
4.1	Total and proportion of females in professional and technical jobs	13.7%
4.2	Total and proportion of females in full-time employment	8.8%
4.3	Total and proportion of females in part-time employment	11.4%
4.4	Total and proportion of females leaving their jobs	7.8%
4.5	Total and proportion of females changing profession before retirement age	9.6%
4.6	Total and proportion of females facing job significance change on return from extended leave	5.9%
4.7	Total and proportion of females returning to their jobs after leave	19.1%
4.8	Average retirement age (work–life) by gender	13.8%
4.9	Extent of merit-based, gender-neutral recruitment	6.2%
4.10	Impact of female protection laws on their hiring	3.7%

### 3.6. Professionalism Category

The Professionalism category received a moderate appreciation of significance by the participants, where the indicators it entailed participated in a way to ensure a fair working environment for employees of different genders. The participants accordingly confirmed all indicators as being quite relevant and informative in supporting the debate, which mainly formed more internal aspects governing the convenience women can expect when working with the business enterprises, alongside their male colleagues. One participant stated that “you can get as many women into the architectural offices in Jordan today, but the fact remains on how well they would be treated in order to remain”, a statement that resonated with the common sentiment demonstrated by other participants.

Concerning the relative weights assigned to the entailed indicators (Table 7), the issues of equitable pay and promotion assumed the highest weights. These were resembled by the indicators covering equitable pay compared to industrial standards (18.1%), the existence of a wage gap between men and women (22.8%), and merit-based, gender-neutral promotion opportunities (20.4%). This resembled the shared interest among most of the participants in secure jobs that are presently rewarding, while offering fair potential for growth. Fairness of performance rewards (9.0%), accessibility to spaces and resources (10.1%), as well as open intercommunications between employees of all genders (8.0%) received moderate weights for their importance in creating a healthy working environment. The gender-neutral setting of performance standards (5.5%) and posts and responsibilities (6.1%) were provided with a relatively lower rating, as these two indicators, while remaining important, are harder to objectively explore, as they relate more to the practice of such guidelines rather than stating them officially.

**Table 7.** Weight distribution of the indicators in the Professionalism category.

#	Indicator	Weight (%)
5.1	Gender-neutral setting of performance standards	5.5%
5.2	Gender-neutral setting of posts and responsibilities	6.1%
5.3	Extent of merit-based, gender-neutral promotions	20.4%
5.4	Gender-neutral distribution of performance rewards	9.0%
5.5	Extent of accessibility to spaces and resources	10.1%
5.6	Extent of open inter-communications between colleagues of different genders	8.0%
5.7	Equitable pay/compensation in line with industry standard	18.1%
5.8	Existence and extent of gender wage gap	22.8%

In viewing the outcomes of this category, several key observations were made. First, the ideas and beliefs of the participants were bound to certain dynamics that control and govern the Jordanian labour market, where stable compensation is prioritised over performance rewards, with the first being more guaranteed [54]. Second, the social content within the workplace was prioritised over the more formal aspects, where matters related to the relations between colleagues and facilitated access were prioritised over indicators pertaining to performance criteria and formal setting of responsibilities. This is quite indicative of the cultural context in Jordan [55–57].

### 3.7. Facilitation Category

The Facilitation category received a relatively lower regard from the part of the participants. The participants were quite vocal in maintaining a very practical stance when it came to such a sensitive topic, where they favoured the actual and practical measures for ensuring gender equality in comparison to ones that were simply a matter of policy or general perception. The facilitation category, with the indicators it entailed, provided a sort of overall protection for the rights of women at the macro level, which were matters worthy of attention but, on their own, would not achieve the impact required. All indicators suggested within this category were seen as relevant by the participants,

with two exceptions. Total events of reported harassment/violence against women were removed as they did not fully resonate with the focus of the study, which was on the working environment within architectural firms. According to the participants, such places are governed by rules and policies that prohibit any sort of harassment or violence against any employee, a matter that is reflected by another indicator in this category. The extent of freedom of movement was also removed, as it was not seen as a pending obstacle in the Jordanian context, where the social norms and enablers allow for the freedom of movement of all, male and female [58].

The indicators within the category received varying weights as per the participants (Table 8). The highest regarded indicators were the accessibility of daycare facilities (20.5%), level of facilitated work–life balance (18.1%), and flexible working hours (15.2%). These indicators were seen mostly related to securing a sound level of facilitation for women and controlling part of the potential challenges faced by them in comparison to men. Weekly working hours (8.8%), unpaid leave (8.7%), and the availability of transport facilities (12.6%) were moderately ranked, whereas the availability of gender equality policies (6.6%), reported events of discrimination (2.3%), zero tolerance to harassment (3.5%), and sufficiency of maternity leaves (3.7%) were ranked least. These indicators demonstrated the overall lower regard received by the category as a whole, where aspects that are either protected by merit of the profession, by policy, or law were seen as quite straightforward to simply stand on the situation of gender equality in the domain of architectural practice. It was seen as more important to weaken, if not lift, the barriers faced by women to better enable them to attend to their work duties and responsibilities, with the provision of the required facilities, flexibility, and freedom.

**Table 8.** Weight distribution of the indicators in the Facilitation category.

#	Indicator	Weight (%)
6.1	Availability of a gender equality policy or guideline	6.6%
6.2	Total of reported events of discrimination	2.3%
6.3	Zero tolerance on harassment and/or inappropriate behaviour/language	3.5%
6.4	Availability of transport facilities	12.6%
6.5	Level of availability and accessibility of daycare and childcare facilities	20.5%
6.6	Level of facilitated work–life balance	18.1%
6.7	Weekly working hours per gender	8.8%
6.8	Level of provided flexible working times	15.2%
6.9	Level of provided unpaid leaves	8.7%
6.10	Duration and sufficiency of maternity leave	3.7%

### 3.8. Support Category

The Support category was ranked lowest among the categories, as it encompassed macro-level indicators that were seen more on the generic side, covering policy, regulatory, and community aspects. Although all indicators entailed were seen as relevant in this category, the variations between them were relatively low, with the exception of the top three indicators (Table 9). Gender community stereotypes (23.1%), the share of women in domestic economic responsibility (20.5%), and the availability of gender equality NGOs (18.3%) were ranked relatively higher, whereas the laws in protection of women (11.0%), as well as their representation in legislative seats (11.6%) and professional associations (8.5%), received a moderate ranking. The share of family care responsibilities (3.7%) and the percentage of early marriages (3.4%) were ranked lowest. As indicated by some participants, we can emphasise generics on the equality rights and empowerment of women on the national level, but being able to achieve formidable results in the architectural professional field requires further investigation with greater levels of detail. Accordingly, the focus was more on the aspects that would potentially enable women to assume their rightful position, far from potential community perceptions of unfairness in social responsibility at their homes. Furthermore, the drive towards the emphasis of NGOs, which mainly promotes

awareness on the matter, in comparison to more regulatory support vehicles, was quite evident, highlighting the beliefs maintained by the participants that the acceptance of the role of women in the professional sector, as well as the community at large, should stem from true conviction, and not through forceful regulation.

**Table 9.** Weight distribution of the indicators in the Support category.

#	Indicator	Weight (%)
7.1	Total and proportion of legislative seats held by females	11.6%
7.2	Existence of cultural gender stereotypes within the community	23.1%
7.3	Total and share of females holding positions in professional associations and committees	8.5%
7.4	Number of laws/legislations in protection for women	11.0%
7.5	Percentage of females in early marriages (15–19 years)	3.4%
7.6	Proportion of females in domestic family-care responsibility	3.7%
7.7	Proportion of females in domestic economic responsibility	20.5%
7.8	Availability of gender equality NGOs	18.3%

#### 4. Conclusions

Enabled by multiple Delphi rounds and AHP-driven evaluation, this study was able to identify the most influential factors impacting gender equality within architectural practices in Jordan. The opinions of the participating experts have indeed informed and enriched the outcomes of the research, getting us closer to a relevant set of indicators that can be used to support better understanding and to derive measures to improve the prevailing situation. Considering the multiple facets entailed in the debate, it was not unorthodox to end up with seven categories that better classify the resultant indicators (Table 10).

**Table 10.** Framework entailing the adjusted weights of the indicators.

#	Category/Indicator	Adj. Weight (%)	#	Category/Indicator	Adj. Weight (%)
1	Education	12.82%	5	Professionalism	12.70%
	1.1	2.65%		5.1	0.70%
	1.2	0.49%		5.2	0.77%
	1.3	1.18%		5.3	2.59%
	1.4	0.56%		5.4	1.14%
	1.5	2.79%		5.5	1.28%
	1.6	0.35%		5.6	1.02%
	1.7	0.85%		5.7	2.30%
	1.8	2.52%		5.8	2.90%
2	Employability	16.80%	6	Facilitation	5.79%
	2.1	1.25%		6.1	0.38%
	2.2	3.18%		6.2	0.13%
	2.3	4.23%		6.3	0.20%
	2.4	1.01%		6.4	0.73%
	2.5	3.03%		6.5	1.19%
	2.6	4.10%		6.6	1.05%
	2.7	4.10%		6.7	0.51%
	2.8	4.10%		6.8	0.88%
3	Enablement	22.41%	7	Support	6.40%
	3.1	2.53%		7.1	0.74%
	3.2	2.40%		7.2	1.48%
	3.3	4.95%		7.3	0.54%
	3.4	2.24%		7.4	0.70%
	3.5	4.29%		7.5	0.22%
	3.6	3.76%			
	3.7	1.23%			
	3.8	1.01%			

Table 10. Cont.

#	Category/Indicator	Adj. Weight (%)	#	Category/Indicator	Adj. Weight (%)
4	Inclusion	23.08%	7.6		0.24%
	4.1	3.16%	7.7		1.31%
	4.2	2.03%	7.8		1.17%
	4.3	2.63%			
	4.4	1.80%			
	4.5	2.22%			
	4.6	1.36%			
	4.7	4.41%			
	4.8	3.19%			
	4.9	1.43%			
	4.10	0.85%			

When considering the different categories incorporated in the research, the acknowledgment of the participants highlighted the need to address the topic on different levels, where the categories of Education and Employability approached the subject from the individual level, and the categories of Enablement, Inclusion, and Professionalism were from the organisational level, and finally the categories of Facilitation and Support covered the national and policy levels. The devised categories, while generally focused on a particular level, can never be considered exclusive, in fact resulting in grey areas and overlaps with other categories, which was bound to occur given the complexity and multiple dimensions of the gender equality challenge. This would be considered one of the limitations of the research that could be addressed with further future studies with the same aim and focus. It is also worth noting that the structure of the expert panel presented another limitation of this research, as most participants were members of the supervisory and management teams. This highlights a need for future research in incorporating further insights from non-supervisory employee levels. While addressing gender equality concern as a localised, context-related topic, international experiences in the field can prove to be quite enlightening. This would highlight an area for future research where the difference in views between experts who received their education locally and the ones who pursued their studies locally could add further depth to the findings and, accordingly, practical recommendations. While this research aimed at assimilating the views of a relatively wide base of experts representing the academic and practical fields, further views are bound to be missed regardless of the size of the participants' sample. This limitation was partly addressed through elaborate discussions, Delphi rounds, and AHP questionnaires, but further studies combining additional experts would assist in refining the outcomes through further expert incorporation.

When the resulting indicators are integrated into a unified framework, certain insights can be obtained. First, a key focus was placed on the relatively more practical indicators influencing gender equality, which was reflected on the emphasis on categories such as enablement and inclusion compared to others such as education or support, and the higher focus on indicators reflecting the quality of work, job stability and rewards compared to others such as professional associations or legislations in support of women. Second, a genuine belief was felt on the capability of women, with the key enablers seen as the attitude demonstrated within the workplace as a key priority, as well as societal perspectives and support as a second. This summarised the two key levels of emphasis, where indicators on a higher level of focus, such as the legislative, were less prioritised. Third, although wage gaps and inequality were expected to receive higher attention, they did not. The focus, instead, was on career progression, enablement of women to obtain managerial roles, and enabling their further influence on decisions made in their respective organisations. When turning such findings into practical recommendations, and while the legislative aspect as part of the Support category was less emphasised, the role of governmental policies, regulations, and initiatives cannot be ignored. Such nationwide support, however,

could be more influential by incentivising the public and private sectors not only to ensure gender equality in their hiring, but also the longevity of tenure and career progression of women, which could prove to be quite influential to the true promotion of gender equality within the architectural sector. This study aimed to unpack and reveal a variety of barriers and indicators that are most relevant to achieving gender equality in the fields of architecture and construction. It did so by incorporating diverse and variant areas and angles of consideration covering the progression cycle of females from education to profession, which is a breadth that was not frequently addressed in the earlier literature.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/buildings14030764/s1>, Table S1: Indicators sourced through the review of literature; Table S2: Long list of indicators.

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