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Sustainable Gender Equality: A Comparative Perspective on STEM Education and Employment in Jordan

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Abstract: Gender equality is a concept that is synonymous with debates towards economic and societal advancement, as manifested through the United Nation's Sustainable Development Goal 5. This study sets out to identify the key indicators driving gender equality in Science, Technology, Engineering, and Mathematics (STEM) education and employment in Jordan. This area is both critical and timely in light of emerging challenges facing technological advancement, progressive economies, and wider societal inclusion strategies within the professional environment. This study predominantly employs a quantitative methodology, utilising a survey to evaluate and rank a comprehensive set of indicators/challenges associated with gender equality in the published literature. Feedback is gathered from both male and female participants. The findings of this study reveal certain categories and indicators that are highly ranked compared with others, with practical aspects such as workplace conditions and professional treatment, societal norms and gender stereotypes, and professional perceptions and underlying gender bias being more predominant in Jordan. This study also revealed differing challenges facing gender equality in employment compared with the ones faced in education. This finding resonates with the historical trajectory of academic progress in STEM fields in Jordan, and its divergence emphasises the need for a nuanced exploration to advance gender equality in STEM effectively.

Keywords: gender equality; STEM; education; employment; sustainable development

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1. Introduction

This study aims at unpacking, whilst contextualising, the challenges of gender equality hindering the advancement of opportunities for women within the STEM (science, technology, engineering, and mathematics) domain. It seeks to identify the key indicators and obstacles in the context of Jordan to facilitate a more nuanced argument on how to improve the prevailing situation best. In doing so, it aims at providing a base for more practical solutions for levelling up gender equality in STEM, as well as potentially other domains. The key findings are likely to be applicable in other countries, as globally, the ongoing gender equality challenge persists.

With the pressing dynamics of an emerging economy, developments in the domain of STEM have experienced differing patterns of growth. Indeed, education in STEM domains has been widely linked to a more innovative future as one that embraces technology, driven heavily by the fourth industrial revolution, which is targeted towards more sustainable growth as promoted by the United Nation's Sustainable Development Goals (SDGs) [1].

With such massive growth and potential, questions on equitable access to opportunities associated with this field have become pressing.

It is widely acknowledged globally that women are not still on par with men in terms of economic opportunities [2] despite enjoying greater educational advancements. This concern is receiving increasing global attention, where studies have shown that the empowerment of women results in better social cohesion and as such, plays an important role in economic development and growth [3], pushing forward the agenda for sustainable development [4,5]. This is particularly evident in the area of STEM, where the inclusion of men and women in a collaborative working relationship promises more elevated levels of innovation and productivity within such an evolving domain [1].

Women's educational attainment in comparison with men has been on the rise, both in terms of participation rate and performance, whereby such advancement in STEM disciplines has been noticeably evident. However, such educational progress is yet to be extended to work-related opportunities, which are still considered modest at best, where the issues of equal opportunity, equal wage, and progression are still lacking [6,7].

The reality is quite stark in Jordan, and particularly in the MENA (Middle East and North Africa) region. In MENA, the average women's literacy rate has increased over the years, rising from 45% in 1990 to 72% in 2018. Tertiary education has also improved, with enrolment rates rising from 24% in 2005 to 43% in 2018 [1]. Educational attainment in STEM is quite evident as girls outperform boys by an average of 29 points, the highest disparity in the region [8]. Notably, women's share of STEM graduates in the region (34–56%) is higher than in most developed nations such as Europe and the United States [9].

However, this almost-bridged gap in education is deterred and even overturned by restricted access to the labour market, which is further weakened by the lack of a clear body of legislation that supports gender equality economically and socially. As a result, the gender gap, being almost bridged in STEM education, is not translated into bridging the gap in the workplace. For instance, in 2020, with the output of tertiary education showing an almost equal distribution between men and women, 57% of STEM graduates were women. On the other hand, women's participation rate in the labour market is around 25% at best, standing at almost half the global average, according to McKinsey and Company [8]. This is exacerbated by women representing nearly 48% of the total working-age population. Moreover, Jordan attains an even lower participation rate of 14%, where the female-to-male ratio in professional and technical occupations is significantly below the average (0.44) [8]. Women's unemployment rate is also significantly higher in the region, at 18%, compared with the rate of 8% for men's unemployment, which is comparatively higher than the rest of the world [7]. Regardless of whether these ratios are the results of women being deprived of work, being unavailable, or not looking for work, the reality of the lack of gender equality remains the same.

Furthermore, women are more likely not to stay in education, employment, or training compared with men [10], where the increase in the female talent pool does not necessarily materialise into increasing their share in the labour force in a sustainable manner. Regarding the quality of work, women tend to be employed more in clerical and support-related jobs, with limited access to management compared with men [7]. In terms of sectoral concentrations, women tend to be employed more in the marketing, health, and social work sectors, whereas, in Jordan, employment trends are in the same sectors in addition to the education sector [11]. Furthermore, according to the same study, Jordan demonstrated a relatively low level of legal protection offered to women, which further hindered any developed inclusion of women in the professional field.

In the Middle East, in general, gender equality has consistently received less attention, where it, according to the World Economic Forum [12], trails other world regions significantly (with a parity of 62.6% compared with Europe's 76.3%, being the highest). This is exacerbated by the fact that such standing has not been improving but rather relatively declining compared with other regions. Jordan ranks 138th out of 153 countries as per the Global Gender Gap Index, where economic participation and opportunity, as well as labour force participation, are at their lowest [10]. This shows the gap between STEM education and employment, where Jordan ranks highly in terms of educational attainment in the same index (with a score of 0.994 out of 1), as a pressing challenge.

Thus, this study aims at providing an analytical, comparative perspective on gender equality in STEM education and employment through synthesising various insights from relevant participants from both genders. This is achieved by targeting the achievement of a number of objectives that include (1) standing on the reality of STEM education and employment and the means through which it can be unpacked and localised in terms of its key influencing aspects within the context of Jordan, (2) identifying and rating the key indicators, and barriers, that are most influential in advancing/deterring the progress of gender equality in this area and organising them into relevant categories, and (3) identifying how such indicators/barriers provide a demarcation in the true understanding between STEM education and employment, especially when considering different views on gender equality. Addressing such challenges promises a clearer view within a context in which the principles of gender equality can still be considered emerging, which would thus benefit potential future policies, strategies, and action plans addressing such a significant domain.

Pillars of Gender Equality in STEM

The gender gap is a pressing issue globally, and it is set as the fifth key goal in the United Nations SDGs [8]. Accordingly, such a topic has been addressed in earlier studies focusing on Jordan or the MENA region, where several socioeconomic and cultural factors were attributed [3,13]. According to a report by PriceWaterhouseCoopers (PWC) [9], the increased participation of women in employment can result in GDP increases of around 57%. Among the issues deterring gender equality in economic activities identified in the literature was the emphasis on the role of women in domestic responsibilities, restrictions of work after marriage, social norms and stereotypes, lack of protective laws, and limited access to finance and capital, among others. Indeed, the push of females by family and the wider society towards non-STEM domains by merit to perceived gender differences was highlighted by Olmedo-Torre et al. [14], where Ceci et al. [15] purported the fundamental differences in education between males and females, whereby the education of females is geared towards more domestic roles.

According to PWC [9], the primary motivator for women to work is to achieve financial independence, pursue career growth/satisfaction, and become role models for others to follow. This, however, is deterred by a work environment that fails to meet their expectations, coupled with the lack of fair treatment compared with their male counterparts, and the lack of training and development opportunities. Women often also experience several barriers that would enable or disable their potential in the workplace, including work–life balance, fulfilling work content, comparable wages and rewards, and mentorships. UNESCO, on the other hand, emphasises the importance of societal support for women in STEM careers, where community-wide stereotypes and work–life balance are the main hindrances to career progression globally [1]. Swafford and Anderson highlighted several areas within STEM disciplines as well as societal norms and perceptions as the key barriers to achieving gender equality: they emphasised aspects such as the lack of mentorship, the lack of respect for women in STEM, the perceived glass ceiling, and the lack of encouragement from colleagues and family members [16]. This was further emphasised by Jakobs, who highlighted that the same repeated challenges women face by social and workplace influences are heavily driven by bias and male dominance [17]. Kessels and Hannover [18] surmised their reflection of such issues on the presence of females in STEM disciplines as stemming from the overall lack of interest, self-perception influenced by gender stereotypes, and the lack of female role models. Friedmann [19] highlighted salary disparity and work–life balance as influential over women's career decisions in STEM.

McKinsey and Company [8], through their study on gender inequality levels in the MENA region, spotted particular areas of inequality in Jordan, where financial inclusion and legal protection were seen as the most imminent. The scores achieved in these areas were relatively lower compared with other countries in the MENA region, such as Kuwait, Oman, and the UAE, with even higher discrepancies compared with some developed nations such as Australia and Canada. The key issues highlighted were the lack of equal pay between men and women, the availability to take on full-time jobs, and the associated work–life balance. Their study, however, presents a silver lining to the situation, where gender equality scores in digital inclusion were considered relatively high, which is a potential strong catalyst for further inclusion of women in STEM-related careers in the future.

Whilst undertaking a comprehensive review of studies addressing gender equality indicators/barriers, different modes of tackling the subject can be identified. Some studies categorised barriers into differing categories: Mukhwana et al. classified them into individual, academic, work-related, confidence, and societal expectations-related aspects [20]; Dasgupta and Stout, on the other hand, associated the barriers with life stages, classifying them into childhood, adulthood, and professional life aspects [21]; other studies relied on some inherent differences between men and women, such as Christie's work, which used the differences in interests, career aspirations, individual differences and attributes, as well as structural and institutional bias [22]; and Hart identified the differences in aptitudes, preferences, parental expectations, and beliefs and stereotypes [23]. While most studies adopted a holistic and comprehensive approach to gender equality in STEM, certain studies were more focused, with the example of Schiavone emphasising societal and work-related aspects such as misconceptions, negative attitudes, bullying, and the instatement of glass ceilings [24]. Fernández Valdez et al. were more attuned to the workplace, identifying key barriers such as unequal opportunities, mentorship, flexibility, work culture, harassment, and bias [25]. Other studies provided particular focus on STEM education with less focus on employability. This includes the works of Stoet et al. [26], Henriksen et al. [27], Mainhard et al. [28], and Menacho et al. [29]. Methodologically, some studies relied on qualitative approaches such as an extensive review of the literature and interviews (such as Warsito et al. [30], Martinez et al. [31], and Yu et al. [32]), whereas others deployed quantitative approaches primarily through questionnaires (such as Cesi and Williams [33], Tandrayen-Ragoobur and Gokulsing [34], and Makarova et al. [35]).

The purpose of this study was to fill the gap found in the literature by providing a comprehensive approach to addressing gender equality in architecture through a lens that combines education and employment. In doing so, it relied on a long list of indicators that covered different educational, societal, work-related, and policy aspects assessed and prioritised through a balanced sample of experts representing the different domains of academia and practice in order to obtain findings that would push a policy debate aimed at a further enhancement in gender equality in the context of Jordan.

2. Materials and Methods

2.1. Approach

To achieve the research aims, including the sourcing, evaluation, and ranking of key indicators/potential challenges facing gender equality in STEM, a quantitative approach that combined multiple data sources and feedback to reach a balanced perspective on the issue was mainly utilised. According to Lorber [36] and Butler [37], the issue of gender is a complex one that entails different epistemological considerations as a social institution as well as an interactive, iterative concern, which renders this research as descriptive in nature, albeit with the utilisation of a quantitative approach to support a more formidable exploration. This highlighted the need for this research to address the concern of gender equality on multiple fronts to provide the required multi-aspect perspective on its enablers and barriers, as they relate to policy, society, workplace, or the individual. As a current and significant concern within the context of Jordan, it was necessary to broaden the sources of background information on the matter, with the use of informed filtration and evaluation, to obtain a relevant set of indicators that can properly inform policymakers, practitioners, and educators as well as form a proper ground to stimulate further research to extend this study's findings.

2.2. Data Collection

This stage aimed at establishing a long list of potential indicators that are organised into categories through which STEM education and employment can be better explored within the context of Jordan, where such indicators would form the base for consequent filtration and assessment. This research commenced with an extended literature review, where multiple sources were reviewed to identify the most recurring and relevant indicators. Such sources included journal articles and reports from governmental entities and non-governmental organisations (NGOs). This was coupled with 11 informal interviews with several experts in the area, representing the academic and practical domains in a manner that would assist in setting the path for exploring not only the most prominent of indicators but less recognisable ones that are seen as influential in reality. Expert advice was also sought to highlight the keywords and domains to guide this research, ahead of presenting a long list of potential indicators. Further potential indicators were proposed by the experts, which they thought would be appropriate to consider within the particular context of Jordan and thus should be part of the initial long list. The interview schedule used with the experts was semi-structured to allow for the free flow of ideas to ensure better early guidance for this study, where experts were provided with the room to extend the limits of conversation and even go beyond the original schedule to further highlight issues and concerns, many of which were dealt with first-hand through their extended experience.

The long list of indicators was later classified into categories to provide a more adequate base for evaluation and ranking. This was performed by benchmarking similar groupings in the reviewed literature and opinions sought through experts in the domain. The categories that were adopted in the classification of the long list of indicators included the following:

- Professional conditions and work attributes, which was used to group the indicators related to how equality is ensured in practice through the employment conditions provided to women compared to men within the workplace. This included aspects related to flexibility of work conditions, achieved work–life balance, the level of supportiveness/exclusivity of the work environment, and male domination concerns.
- Professional perceptions and gender bias, which aimed at grouping indicators pertaining to the underlying views and expectations concerning the qualifications, attitudes, and professionalism of women compared to men. Such perceptions are not necessarily demonstrated officially through internal policies or practices, for example, but nonetheless impact the fair positioning of women in the workplace. This covered aspects related to income equality, perceptions over adequacy and qualification, and the instatement of glass ceilings, as well as discrimination and harassment.
- Societal perceptions, influences, and gender stereotypes, which summarises the general views and beliefs maintained by society at large about women's qualifications, abilities, and suitability to provide a professional contribution equal to men. This included matters such as perceived gender roles, stereotypes, and misconceptions over abilities and suitability in STEM, as well as rationality.
- Individual confidence/interest/awareness/circumstances, which address the intrinsic factors impacting the internal awareness, interest, and motivation of women to actively participate in the professional work environment, in consideration of surrounding enablers and deterrents. This included roles within the family, awareness of educational and professional opportunities, and levels of interest in STEM, as well as self-perception and confidence.
- Support and empowerment, which covers the macro-scale support provided to women by ensuring their equitable consideration and treatment, whether through policy or guidelines that mostly receive institutional or legal support. This included aspects such as the effectiveness of the attractions to STEM, mentorship and guidance, access to training and skilling, and policies and guidelines, as well as family support.
- Academic-related reasons, which focus on gender equality throughout the educational stages in a manner that would ensure the proper awareness and preparedness provided

to women compared to men, to offer equal opportunity, qualification, and development for women and men in preparation for their active contribution into the professional environment. This included mindsets and attitudes, support from educators and peers, and differences in academic achievement, as well as language and financial barriers.

The categories utilised, while being informed by the reviewed literature and previous studies, aimed to provide a balanced approach that would span the different levels of indicators/barriers to gender equality (from policy to society, the workplace, and the individual). This aimed to facilitate the identification of issues on multiple levels to properly inform multi-level planning and improvement in tackling such a multidimensional concern.

2.3. Research Sample

In order to complete the assessment and evaluation of the sourced indicators in a manner that would enable their proper filtration and identification of the most influential of them, a detailed questionnaire was designed to obtain feedback from a sample of relevant experts in the area, combining members of academia, practice, and government (Supplementary Materials). The composition of the participant sample is described in Table 1. Such a diversified base was intended to ensure that the multi-dimensional nature of the research topic was captured properly, where participants were asked to rate the listed indicators on a 5-level scale of significance, with (−2) being not important at all to (2) being very important. The survey lasted from April to September 2023, resulting in a total of 116 responses. The academics had a comprehensive understanding of the STEM challenges faced in the proper bridging between academia and the business sector; the practitioner's view resonated with the challenges faced in the inclusion and sustenance of STEM professionals in their employment and careers; and the government officials provided a nuanced approach in consideration of the macro policy level in light of the challenges recognised nationally.

Table 1. Characteristics and distribution of the research participants.

Aspect	Distribution				
Age	20–25	26–30	31–40	40–50	51+
	16%	43%	23%	14%	3%
Gender	Male	Female	Undisclosed		
	49%	51%			
Educational level	Bachelors	Masters	PhD		
	46.5%	41.7%	11.8%		
Field of experience	Academia	Practice	Government		
	34.6%	36.2%	29.2%		
Experience in STEM	0–10 Y	11–20 Y	21+ Y		
	37.3%	42.4%	20.3%		

The sample size was calculated according to Equation (1). The base population was chosen with reference to the number of registered architects and civil engineers at the Jordanian Engineering Association with a minimum of three years of experience, where the reported number, according to the published figures for 2023, was around 52,000 architects [38]. Such a population was corrected by factoring the average unemployment rate in Jordanian engineers, rated at 23%, to ensure the relevance of feedback received by seeking the views of architects working in academia, practice, or the government. This resulted in a corrected population of 40,100. Considering a confidence level of 95% and a margin of error of 10%, the acceptable sample size was 96. This takes in consideration the nature of receive and the extent to which it is socially driven. The issue of gender equality is considered highly contested, where the outcomes are usually addressed in an iterative, exploratory manner.

$$\text{Sample Size} = (\text{Z-score})^2 \times \text{StdDev} \times (1 - \text{StdDev})/(\text{Confidence interval})^2 \quad (1)$$

The Z-score was calculated based on the chosen confidence level, with a standard deviation of 0.5.

Upon analysing the received questionnaires, the significance of each indicator was calculated using Equation (2), where each of the five significance levels was weighed according to a scale of (−2, −1, 0, 1, 2).

$$\text{Significance} = [(-2 \times R_1) + (-1 \times R_2) + (0 \times R_3) + (1 \times R_4) + (2 \times R_5)]/(R_1 + R_2 + R_3 + R_4 + R_5) \quad (2)$$

where R represents the number of participants choosing a certain significance level.

The questionnaire outcomes were tested for consistency and reliability by calculating Cronbach's Alpha, which resulted in a value of 0.96, demonstrating a high consistency level.

2.4. Analysis

This step aims at providing a deeper understanding of the evaluated indicators and how the alignment and differences in feedback received by the participant groups (with consideration of males and females) could be identified and interpreted. Upon identifying the calculated significance of each evaluated indicator per category, they were ranked to demonstrate their relative importance compared to other indicators within the same category. This revealed the overall ranking of the concerned indicators as taken from the participants' collective views. The analysis was followed by a more detailed comparison between the feedback received from the members of academia and practice. Okpala and Aniekwu's quantitative analytical approach obtained the levels of agreement between these two types of participants [39]. It is based on calculating the Rank Agreement Factor (RAF), which reflects the average absolute difference in the ranking of the indicators between the two types of participants. This is calculated by using Equation (3):

$$RAF = \sum_{i=1}^{N} \frac{|Ri1 - Ri2|}{N} \quad (3)$$

where Ri1 is the rank provided by the first type of participants, Ri2 is the rank provided by the second type of participants, and N is the number of indicators, where j = N − i + 1.

The percentage of disagreement is later calculated by using Formula (4), where the percentage of agreement is calculated as the remainder of the 100%.

$$PD = \frac{\sum_{i=1}^{N} \left|Ri1 - Ri2\right|}{\sum_{i=1}^{N} \left|Ri1 - Rj2\right|} \times 100 \quad (4)$$

Upon identifying the key areas of agreement and disagreement, further elaboration was sought through detailed discussions with the participants to identify the key motives behind such agreement or disagreement, resulting in a balanced understanding of the reality of gender equality in STEM within the Jordanian context.

3. Results

The questionnaire responses showed variations in the levels of importance and ranking perceived by the research participants against the long list of indicators, as reflected in the relative importance and ranking of the identified key categories. Each indicator was provided with a local rank corresponding to its relative importance within its designated category, as well as a global rank showing its level of importance when compared with all other indicators, irrespective of category. The outcomes provide some informative insights into the gender equality debate in STEM. Although a certain level of disagreement was foreseen between the male and female participants, such variance revealed certain agreements on several indicators, moderate differences about others, and complete differences in other cases. This matter that was further investigated to identify the underlying motivations behind such concurrences and/or differences.

3.1. Categorical Outcomes

In light of the global ranking received by the indicators, each category was provided with an average score, which was then compared to the average ranking obtained by the other categories to understand their relative importance (Table 2). Professional conditions and work attributes received the highest average score of (0.669), followed by societal perceptions, influences, and gender stereotypes (0.643). Support and empowerment came third (0.633), followed closely by individual confidence/interest/awareness/circumstances (0.630). Professional perceptions and gender bias (0.615), as well as academic-related reasons (0.607), came last with the lowest assigned importance. The categorical results highlighted a relative alignment with the categories adopted by Mukhwana et al. [20], Christie [22], and Hart [23] in terms of addressing the importance of work-related aspects, societal norms, and support, as well as personal attributes and levels of interest. The results, on the other hand, placed lower priorities on aspects related to academics (earlier supported by Mukhwana et al. [20]) and professional perceptions/gender bias (earlier supported by Christie [22]).

Table 2. Scores and rankings of the key indicator categories with the level of rank agreement.

#	Category	Weight—Overall	Weight—Females	Weight—Male	RAF—Local	RAF—Global	PD—Local	PA—Local
1	Professional conditions and work attributes	0.669	0.687	0.652	3.18	13.41	40.9%	59.1%
2	Professional perceptions and gender bias	0.615	0.654	0.577	7.19	23.14	100.0%	0.0%
3	Societal perceptions, Iinfluences, and gender stereotypes	0.643	0.670	0.616	1.14	14.29	33.3%	66.7%
4	Individual confidence/interest/awareness/circumstances	0.630	0.644	0.616	2.20	24.30	47.8%	52.2%
5	Support and empowerment	0.633	0.658	0.607	4.14	21.29	70.7%	29.3%
6	Academic-related reasons	0.607	0.627	0.588	4.68	11.50	50.7%	49.3%

While the relative importance and, accordingly, ranking, of the concerned categories reflected the average importance of their associated indicators, it nevertheless conveyed a general outlook from the participants about their concept and emphasis, as encapsulated within their naming. Indeed, by going through the overall ranking outcomes, the participants adopted quite a practical view about promoting gender equality in STEM education and profession. This led to assigning the highest relative rank to the professional conditions and attributes of the work environment, where such conditions were seen as most relevant to the true promotion of gender equality by the participants. This category received a noticeably high average ranking compared with all the other categories, which could represent the internal professional challenges potentially faced in achieving gender equality. On the other hand, external challenges were placed second, with societal perceptions and influences seen as a source of possible hindrance to gender equality. Indeed, this category could have a significant influence over the enablement or challenge of gender equality, where the perception of women in STEM education or at work can significantly impact their successful inclusion into academic institutions as well as work enterprises.

Self-awareness and conviction, being ranked third among the categories, represented the internal motivation and enablement of males and females to engage equally in STEM education and employment, where personal qualifications, skills, and levels of interest and awareness would support the equal and valuable contribution of both into the academic and practical domains, thus facilitating gender equality when such traits are seen equivalent or closely rated. This has been closely ranked and associated with the equal support and upskilling provided to males and females within their academic and practical domains to ensure their proper inclusion and equal contribution in STEM. Thus, the participants saw these two categories as almost equally important. Professional perception and gender bias, along with academic attributes, were ranked lowest. Maintaining a practical stance, the participants did not see both categories as critical for different reasons. With a focus on the self-motivation and independence of students and workers in terms of actively deciding on their pathways and careers, professional perceptions and actions against gender bias were not seen as quite influential in comparison with the qualifications and performance of males and females in STEM education and employment. On the other hand, education was ranked mostly in light of the local context, where the sustainably rising levels of education and equitable access to education were quite notable in Jordan, as reflected in the general statistics corresponding to such aspects.

3.2. Professional Conditions and Work Attributes

Being the highest-ranked category, it was not surprising that a number of its indicators were highly ranked, locally within the category and globally within all the considered indicators (Table 3). The weight range of the indicators was between (0.562) and (0.734). The top indicators included competitiveness and facing expectations (0.734), queen bee syndrome in the workplace (0.728), the lack of flexible work conditions (0.719), and demanding schedules coupled with career insecurity (both receiving a score of 0.712). The lowest indicators in this category included having few female peers, supervisors, and managers (0.626), the lack of career management and leadership skills (0.597), and the lack of STEM abilities and achievements (0.562). Some of the indicators that were moderately placed in this category included the difficulty of maintaining a work–life balance (0.697), the lack of supportive facilities (0.684), slow career progression, and the difficulty of securing positions in the same geographic area (both receiving a score of 0.678).

Table 3. Scores and ranks of indicators of the professional conditions and work attribute category.

#	Factor	Overall Wght	G.Rank	L.Rank	Females Wght	G.Rank	L.Rank	Males Wght	G.Rank	L.Rank
A_3	Competitiveness and facing expectations	0.734	1	1	0.738	3	2	0.731	2	2
A_4	Queen bee syndrome in the workplace	0.728	2	2	0.700	17	10	0.755	1	1
A_6	Lack of flexible work conditions and arrangements	0.719	3	3	0.714	13	8	0.724	3	3
A_9	Demanding schedules for STEM-related careers	0.712	4	4	0.748	2	1	0.676	7	5
A_7	Working conditions and career insecurity	0.712	4	4	0.724	7	4	0.700	4	4
A_8	Difficulty in finding work–life balance	0.697	8	6	0.724	7	4	0.669	9	6
A_11	Lack of supportive facilities in the working environment	0.684	12	7	0.731	5	3	0.638	21	9
A_14	Difficulty in securing positions in the same geography	0.678	14	8	0.724	7	4	0.631	27	11
A_13	Slow career progression	0.678	14	8	0.721	10	7	0.634	25	10
A_10	Unwelcoming, unsupportive/exclusive work environment	0.674	16	10	0.703	15	9	0.645	17	8
A_15	Absence of transport facilities	0.671	18	11	0.679	29	11	0.662	14	7
A_5	Qualification of women compared to men	0.641	34	12	0.655	45	13	0.628	30	12
A_1	Male domination in STEM careers	0.634	39	13	0.641	60	15	0.628	30	12
A_12	Difficulty in returning to STEM Careers After a pause or leave	0.631	41	14	0.666	39	12	0.597	51	15
A_2	Few female peers, supervisors, and managers	0.626	46	15	0.655	45	13	0.597	51	15
A_17	Lack of women's career management skills, leadership	0.597	70	16	0.572	86	17	0.621	33	14
A_16	Lack of women's STEM abilities and achievements	0.562	85	17	0.576	84	16	0.548	77	17

These outcomes reveal two interesting findings: the first is the challenges women face in proving capability at the workplace, which is intrinsic to a threshold of expectations that potentially casts a negative shadow over their capability until proven otherwise. This is exacerbated by the notion of such expectations being conveyed through the management ranks within organisations, where females become potentially influenced by this notion upon stepping up the organisational ladder. Secondly, working conditions that would respect the specific needs of women compared with men are also another source of challenge, which is reflective of the performance indicators set by organisations in a manner that might value the employee in terms that might not be fair to women, such as working long hours versus the contribution provided at the workplace. The influence of such findings can be probed by going through the indicators that were rated lowest in this category, where having female peers and/or supervisors, the ability to achieve, and leadership challenges were not seen as influential in light of other more critical issues that would need to be resolved first. In other words, basic limitations about perception take precedence in eliminating barriers women face before going through other indicators that would then enhance gender equality in the workplace. These results are synonymous with the findings of PWC [9] on the work environment, equal treatment, and work–life balance, which was also in line with UNESCO's findings [1].

3.3. Professional Perceptions and Gender Bias

With this category being the second lowest as per the questionnaire outcomes, most of its entailed indicators received a relatively lower global ranking than others (Table 4). This was mainly driven by the lack of recognition from the participants of the deep existence of gender bias as a prevalent attitude while acknowledging the need to address several indicators that would counter the challenges faced in that regard. Among the visited indicators, some were further recognised compared with others, with many factors achieving a higher rating, including income inequality and gender pay gaps (0.669), negative attitudes towards women (0.655), and the lack of recognition of women's abilities (0.643), as well as explicit and implicit gender bias (0.641). The lowest-rated indicators in this category included females' perceived level of intelligence (0.555) and masculinity associated with creativity (0.553). The indicators that were moderately ranked within this category included the perceived lack of commitment among women (0.631), women being perceived as less competitive, the glass ceiling hindering women's professional progression, and women being discouraged from managerial positions (with the three receiving 0.622).

Table 4. Scores and ranks of indicators of the professional perception and gender bias category.

#	Factor	Overall Wght	G.Rank	L.Rank	Females Wght	G.Rank	L.Rank	Males Wght	G.Rank	L.Rank
B_6	Income inequality/gender pay gap	0.669	20	1	0.693	21	2	0.645	17	1
B_4	Negative attitudes towards women, intimidation, and microaggressions	0.655	26	2	0.679	29	6	0.631	27	3
B_8	Lack of recognition of women's abilities and performance	0.643	33	3	0.655	45	11	0.631	27	3
B_1	Explicit and implicit gender bias where men are favoured	0.641	34	4	0.697	20	1	0.586	58	9
B_5	Lack of fairness in hiring	0.628	44	6	0.679	29	6	0.576	62	10
B_3	Sexual harassment	0.628	44	6	0.645	56	15	0.610	39	5
B_19	The glass ceiling, suspicious views about women's abilities to progress	0.622	47	8	0.683	26	4	0.562	67	11
B_21	Women being discouraged from the managerial positions	0.622	47	8	0.683	26	4	0.562	67	11
B_2	Institutional discrimination	0.621	50	11	0.652	53	14	0.590	56	8
B_9	Bias in promotion, career mobility, advancement, rewards	0.617	53	12	0.686	25	3	0.548	77	16
B_14	The general perception that women cannot hold permanent positions	0.610	58	15	0.679	29	6	0.541	83	19
B_15	The general perception that women are not qualified enough	0.610	58	15	0.659	41	9	0.562	67	11
B_18	Women being given fewer interesting assignments and roles	0.607	62	17	0.655	45	11	0.559	72	14
B_7	Lack of fairness in the evaluation	0.603	66	18	0.659	41	9	0.548	77	16
B_17	Women being forced to take more passive roles	0.600	68	19	0.655	45	11	0.545	82	18
B_20	The glass cliff: women assigned riskier positions in leadership	0.567	84	20	0.645	56	15	0.490	91	21

The outcomes here support the outcomes of the earlier category, where women are not seen as inferior to men concerning work attributes or personal traits. Their capabilities are, however, questioned in terms of how they would stand within the actual working environment. This reflects on challenges related to wage gaps and general attitude which, even if capabilities were proven, would still question the competitiveness demonstrated during careers compared to men. Matters about commitment among women, the persistence of a glass ceiling, and discouragement in taking managerial positions all indicate performance standards that need reconsideration. Even though most indicators in this category received relatively low global rankings, the local rankings of its indicators still place certain matters into perspective. These findings correspond with the study outcomes of Swafford and Anderson [16], Jakobs [17], and Schiavone [24] on women's conditions in STEM careers and career management with the barrier of male dominance and a glass ceiling. They also align with PWC [9] and McKinsey and Company [8] on the lack of equal compensation.

3.4. Societal Perceptions, Influences, and Gender Stereotypes

This category achieved a mid-upper ranking compared with the other categories, which was partially influenced by the relatively lower number of indicators it entailed (Table 5). Among such indicators, a number were distinct about the high ranks they received, including women being perceived as less rational (0.709), followed by societal gender/common roles as perceived by the society (0.667), and gender stereotypes of women's lower physical and mental abilities (0.650). Several indicators received a generally lower rating, including the fear of not conforming to traditional societal views (0.610) and the preferential treatment of men (0.600). The indicators that were moderately placed in this category included gender role socialisation and interaction (0.636) and STEM misconceptions as being not appropriate to women (0.629).

Table 5. Scores and ranks of indicators of the societal perceptions, influences and gender stereotypes category.

#	Factor	Overall Wght	G.Rank	L.Rank	Females Wght	G.Rank	L.Rank	Males Wght	G.Rank	L.Rank
C_2	Women are perceived as less rational	0.709	6	1	0.731	5	1	0.686	6	1
C_7	Societal gender roles with women's common role in society	0.667	22	2	0.676	35	3	0.659	15	2
C_1	Gender stereotypes—women are perceived with lower physical and mental abilities	0.650	27	3	0.679	29	2	0.621	33	3
C_6	Gender role socialisation and interaction, women being treated differently	0.636	38	4	0.669	36	4	0.603	47	5
C_3	STEM misconceptions, not appropriate for women	0.629	43	5	0.648	54	6	0.610	39	4
C_4	Fear of not conforming to traditional societal views	0.610	58	6	0.631	63	7	0.590	56	6
C_5	Preferential treatment for men	0.600	68	7	0.659	41	5	0.541	83	7

The findings of this category emphasise the general societal outlook towards women within the local context of Jordan, which is quite indicative of the public social perceptions in the Arab region. Women are not held inferior to men but are seen as less required to participate in the workplace equally. Such norms further emphasise women's role at home, where the shared responsibility with men towards such issues as childcare and domestic management are less emphasised, which is in alignment with the findings of PWC [9], UNESCO [1], Swafford and Anderson [16], and Schiavon [24]. While society does not see this as preferential treatment to men at the expense of women, it nevertheless reflects less gender equality across the different educational and work domains. A view towards the social role of women accordingly overshadows their perceived participation in more professional fields, among which are the domains of STEM.

3.5. Individual Confidence/Interest/Awareness/Circumstances

This category, being ranked at a mid-lower level, entailed several indicators that were ranked among the highest globally and others that were rated at much lower ranks (Table 6). This demonstrated a wider variety of perceptions compared with the moderate number of indicators entailed, with scores ranging between 0.703 and 0.590. Among the indicators that achieved a higher ranking were the female role in the family (maternity, pregnancy, etc.) (0.703), the effect of life stage and family expectations (0.686), and the lack of awareness of career opportunities (0.659). The indicators ranked lowest in this category included self-perception, the lack of self-confidence (0.597), and feeling like a misfit in a STEM-related field (0.590). The indicators achieving a moderate ranking included self-efficacy about

STEM-related subjects (0.619), the lack of personal interest in STEM fields (0.605), and self-imposed fear of STEM (0.602).

Table 6. Scores and ranks of indicators of the individual confidence/interest/awareness category.

#	Factor	Overall Wght	G.Rank	L.Rank	Females Wght	G.Rank	L.Rank	Males Wght	G.Rank	L.Rank
D_8	Female role in family, pregnancy, maternity	0.703	7	1	0.707	14	1	0.700	4	1
D_9	Effect of life stage and family expectations	0.686	11	2	0.703	15	2	0.669	9	2
D_7	Lack of awareness of career opportunities	0.659	25	3	0.648	54	5	0.669	9	2
D_6	Lack of awareness of educational opportunities	0.647	30	4	0.655	45	3	0.638	21	4
D_3	Self-efficacy about STEM-related subjects	0.619	52	5	0.614	72	8	0.624	32	5
D_5	Lack of personal interest in STEM fields	0.605	64	6	0.593	81	10	0.617	36	6
D_2	Self-imposed fear of STEM	0.602	67	7	0.621	69	7	0.583	60	7
D_1	Self-perception and lack of self-confidence	0.597	70	8	0.655	45	3	0.538	86	10
D_10	Feeling like a misfit in STEM-related fields	0.590	75	9	0.610	74	9	0.569	65	8
D_4	Lack of confidence to apply for positions and promotions	0.590	75	9	0.631	63	6	0.548	77	9

The outcomes of this category align with the findings of the earlier one, where societal perceptions were deemed sufficient to place personal barriers on women, which eventually would impact aspects related to self-confidence and levels of interest in participating further in STEM-related domains. The pressure of societal expectations relevant to women's domestic roles and the lack of societal preference for their engagement in STEM, being perceived as more suitable to males, would accordingly result in less involvement and awareness of women regarding the opportunities that are available for their further engagement; this is a challenge worthy of addressing in light of its collective and personal impacts. These outcomes align with the findings of Swafford and Anderson [16] on STEM awareness issues, the findings of Jakobs [17] on societal pressures and influences, as well as McKinsey and Company [8] on personal limitations in taking on STEM careers.

3.6. Support and Empowerment

This category was comparable to the earlier one regarding the overall ranking among the categories and the number of indicators (Table 7). The variety of rankings received by the indicators was also notable, yet with a relatively lower range of variation (0.684–0.586). Among the top-ranked indicators were the lack of support networks (0.684), parental influences on interest and achievements (0.671), and the lack of access to vocational training and development opportunities (0.664). Among the lowest ranked indicators were the leaky pipeline causing women to drop out of STEM education and careers (0.593) alongside the lack of encouragement from friends and peer influence (0.586). Several moderately ranked indicators included the lack of encouragement from women, ineffective programs to attract women to challenging jobs (both receiving a score of 0.650), and the lack of female mentors/role models (0.647). These results correspond to the findings of PWC [9] and Fernández Valdez et al. [25] on the lack of training and mentorship and the findings of Swafford and Anderson [16] on the importance of training and family support.

What is interesting in the findings of this category is the emphasis on challenges facing women in entering the fields of STEM education and employment compared with their stability after entry. This further highlights the barriers posed by societal norms and perceptions, where women are less encouraged and attracted towards joining STEM-related education and employment, and where indicators pertaining to their stability and tenure in these areas are underrated. The high ranks received by indicators such as women's incorporation into vocational training are quite illuminating concerning the barriers hindering female participation within areas seen as dominated by males. The societal pressures are further recognised in older generations' general norms and traditions, whereas the younger ones, reflected by peers and friends, appear to be less dominant.

Table 7. Scores and ranks of indicators of the support and empowerment category.

#	Factor	Overall Wght	G.Rank	L.Rank	Females Wght	G.Rank	L.Rank	Males Wght	G.Rank	L.Rank
F_2	Lack of support networks	0.684	12	1	0.700	17	2	0.669	9	1
F_6	Parental influences on interest and achievements	0.671	18	2	0.693	21	3	0.648	16	2
F_12	Lack of access to vocational training and development opportunities	0.664	24	3	0.721	10	1	0.607	46	7
F_14	Ineffective programs to attract women to challenging jobs	0.650	27	4	0.690	24	5	0.610	39	5
F_5	Lack of encouragement from women	0.650	27	4	0.659	41	8	0.641	20	3
F_3	Lack of female mentors/role models	0.647	30	6	0.693	21	3	0.600	48	8
F_1	Lack of professional mentorship and counseling	0.638	37	7	0.683	26	6	0.593	55	11
F_4	Lack of encouragement from men	0.621	50	8	0.628	65	10	0.614	37	4
F_13	Lack of strategies and policies for gender balance in STEM areas	0.616	54	9	0.669	36	7	0.562	67	13
F_8	Lack of encouragement from teachers/teacher influence	0.614	56	10	0.645	56	9	0.583	60	12
F_10	Being faced with expectations from professionals, academics, and the general public	0.612	57	11	0.624	67	12	0.600	48	8
F_7	Lack of encouragement and support from family members	0.610	58	12	0.610	74	13	0.610	39	5
F_11	Leaky pipeline, Women dropping from pursuing STEM education and career	0.593	73	13	0.628	65	10	0.559	72	14
F_9	Lack of encouragement from friends/peer influence	0.586	78	14	0.576	84	14	0.597	51	10

3.7. Academic-Related Reasons

This category received the lowest ranking among the categories for the earlier-stated reasons. It was, however, characterised by the highest number of entailed indicators that showed a relatively large variety (0.697–0.524), although many of its indicators were ranked at the lowest of the scale compared with other indicators, expectedly (Table 8). Among the highly ranked indicators were personal goals and values (0.697), energy required (0.688), mindset and attitudes towards STEM in school (0.674), and time needed (0.666). The lowest-ranked indicators included STEM education being directed at boys (0.559), STEM courses being different (0.541), gender differences in math and science abilities (0.538), and girls having less curiosity towards information (0.524). The moderately ranked indicators included limited opportunities for specific socioeconomic backgrounds (0.645), the lack of girls' exposure to informal science experiences (0.640), parents, peers, and teachers' expectations (0.633), and challenges in accessing educational resources (0.607).

Table 8. Scores and ranks of indicators of the academic-related reasons category.

#	Factor	Overall Wght	G.Rank	L.Rank	Females Wght	G.Rank	L.Rank	Males Wght	G.Rank	L.Rank
G_11	Personal goals and values	0.697	8	1	0.717	12	3	0.676	7	1
G_3	Energy required	0.688	10	2	0.738	3	2	0.638	21	3
G_12	Mindset and attitudes towards STEM in school	0.674	16	3	0.679	29	5	0.669	9	2
G_1	Educational expenses	0.669	20	4	0.700	17	4	0.638	21	3
G_2	Time required	0.666	23	5	0.755	1	1	0.576	62	12
G_21	Limited opportunities for specific socioeconomic backgrounds	0.645	32	6	0.655	45	8	0.634	25	5
G_8	Lack of girls' exposure to informal science experiences	0.640	36	7	0.669	36	6	0.610	39	8
G_10	Parents', peers', and teachers' expectations	0.633	40	8	0.666	39	7	0.600	48	10
G_20	Challenges in accessing educational resources	0.607	62	9	0.645	56	9	0.569	65	14
G_15	Gender differences in math and science interest	0.605	64	10	0.597	78	15	0.614	37	7
G_7	Access to schooling and extra-curriculum	0.597	70	11	0.617	70	11	0.576	62	12
G_13	Math and science anxiety	0.591	74	12	0.624	67	10	0.559	72	16
G_5	Boys find it easier to learn STEM	0.588	77	13	0.590	82	17	0.586	58	11
G_22	Language barriers	0.584	79	14	0.607	77	14	0.562	67	15
G_19	Financial constraints	0.583	80	15	0.610	74	13	0.555	75	17
G_9	Teaching methods: the teachers do not simplify the lessons	0.581	81	16	0.614	72	12	0.548	77	18
G_16	Female students cope less with confusion and difficulties	0.581	81	16	0.552	87	19	0.610	39	8
G_18	Girls show lower persistence in STEM	0.574	83	18	0.528	90	21	0.621	33	6
G_4	STEM education directed at boys	0.559	86	19	0.597	78	15	0.521	88	21
G_6	STEM courses are difficult	0.541	89	20	0.552	87	19	0.531	87	20
G_14	Gender differences in math and science abilities	0.538	90	21	0.579	83	18	0.497	90	22
G_17	Girls have less curiosity towards information	0.524	91	22	0.507	91	22	0.541	83	19

The outcomes of this category identify several key aspects. First, there is a lack of awareness provided to females sufficient to achieve general interest in STEM fields, which has a potential effect on the general attitude of females towards participating in such fields. Second, expectations towards the potential performance of females in STEM also place another barrier, a matter that contradicts the statistics showing the overall outperformance of females to their male peers. Third, the lack of practical experiences and exposure adds to women's hindrances in achieving higher participation rates in education and, consequently, employment. While such a challenge is expected to impact males similarly, such impact remains less influential in light of the lower barriers of expectations and societal perception they receive.

4. Discussion: Gender-Specific Comparative Outcomes

When addressing a topic such as gender equality, a sensitive approach must be considered, acknowledging that such matters may have controversies among the selected subjects, especially when they represent different genders. When attempting to source, select, and prioritise indicators for assessing gender equality in STEM, it is of utmost importance to check the levels of concurrence and differences in views, where such alignment or misalignment promises further insights into the subject matter.

Certain insights can be extracted from Table 2, which illustrates the RAF and PD/PA analysis of the participant feedback. Varying levels of acceptance can be viewed by going through the categories. The category receiving the highest level of acceptance by men and women was societal perceptions, influences, and gender stereotypes (66.7%), followed by professional conditions and work attributes (59.1%), individual confidence/interest/awareness/circumstances (52.2%), academic-related reasons (49.3%), and support and empowerment (29.3%). Professional perception and gender bias had a unique status of almost complete disagreement between both groups of participants.

In general, four out of the six categories demonstrated a fair level of agreement, with almost 50% or above. The lowest two categories, in terms of endorsement, featured one with higher consensus than the other, which would indicate that the latter (professional perception and gender bias) may have achieved a different rank if it were not for the diverse views of the two groups. Yet, this category received the highest controversy amongst the participants in light of the differences in the level of importance of its entailed indicators. This would highlight a general sense of difference, which could be expected considering the diverse work environment and different establishments the participants belong to, where notions towards equal qualifications, contribution, and value might also be various. However, it indicates a particularity that would stimulate the need for further investigation.

On the other hand, the top two categories pertaining to workplace conditions and societal norms and perceptions received a higher level of concurrence, providing such categories with legitimacy through shared views and opinions. This is also highlighted by the lower average RAFs viewed in these two categories when considered locally and globally compared to the other categories. Another finding of this study is the reconfirmation that the issue of gender equality in STEM seems to place more weight on the challenges faced in employment compared with education, which comes in light of what was presented in statistics and studies indicating that the level of participation in education in Jordan is becoming higher. The relatively decent level of agreement (almost 50%) demonstrates a shared view of education-related aspects as a category of collective indicators, not assuming a highly pressing issue considering the local context.

Providing a global view of the indicators, the overall agreement rate is moderate at 48.6%, which reflects the agreement levels of the categories being close above or below this figure. When going through the indicators, some particularities about the levels of agreement or difference between the two participant groups can be identified. Table 9 provides a list of 19 indicators that displayed a variation of five ranks or less between the male and female participants, where it can be seen that the top two categories receiving such concurrence were professional conditions and work attributes (with most indicators being highly ranked) and academic-related reasons (with most indicators being ranked as moderate or on the lower end). This emphasises a shared perspective among the participants of the importance of working conditions supporting gender equality, such as addressing the specific needs of women workers, managing negative or over-demanding expectations, and ensuring a proper work–life balance. On the other hand, concurrence was noticed between the participants on a lower ranking of education-related issues, where issues of access to resources and availing support to enhance participation and provide practical learning experiences were moderately ranked. In contrast, gender differences in academic performance and persistence were ranked relatively low.

Table 9. Indicators demonstrating relative agreement between the participant groups.

#	Category	Global Rank	Indicator	Rank Difference
A_9	Professional conditions and work attributes	4	Demanding schedules for STEM-related careers, long working hours	5
A_3	Professional conditions and work attributes	1	Competitiveness and facing expectations	1
C_2	Societal perceptions, influences, and gender stereotypes	6	Women are perceived as less rational	1
A_7	Professional conditions and work attributes	4	Working conditions and career insecurity	3
A_8	Professional conditions and work attributes	8	Difficulty in finding work–life balance	2
G_11	Academic-related reasons	8	Personal goals and values	5
A_10	Professional conditions and work attributes	16	Unwelcoming, unsupportive, and exclusive work environment	2
G_1	Academic-related reasons	20	Educational expenses	4
B_6	Professional perceptions and gender bias	20	Income inequality/gender pay gap	4
F_6	Support and empowerment	18	Parental influences on interest and achievements	5
B_4	Professional perceptions and gender bias	26	Negative attitudes towards women, intimidation, and microaggressions	2
C_1	Societal perceptions, influences, and gender stereotypes	27	Gender stereotypes—women perceived with lower physical and mental abilities	4
G_8	Academic-related reasons	36	Lack of girls' exposure to informal science experiences	3
B_2	Professional perceptions and gender bias	50	Institutional discrimination	3
F_8	Support and empowerment	56	Lack of encouragement from teachers/teacher influence	4
G_13	Academic-related reasons	74	Math and science anxiety	5
G_9	Academic-related reasons	81	Teaching methods: the teachers do not simplify the lessons	5
G_19	Academic-related reasons	80	Financial constraints	1
G_6	Academic-related reasons	89	STEM courses are difficult	0

While some indicators offered quite comparative rankings between men and women, others displayed quite a variance in their ranking. Table 10 details the top 14 indicators featuring the highest levels of rank differences between the two groups. Notably, most of the indicators belonged to the following two categories: professional perceptions and gender bias and academic-related reasons. While it was not surprising to see the indicators belonging to the former, with their category being the most conflicted, it was peculiar to find the same for the latter, as it was a category that also included indicators among the most agreeable between men and women. With a deeper look into the findings, the trends in difference/agreement can be classified into the following two sub-areas: educational attainment and performance, on which both groups agreed, and levels of interest and initial suitability to the particular subject, which was debated. It can also be noticed that in most cases of disagreement, women had significantly placed a lower emphasis and ranking than men. This would entail, in part, a perception held by men of women being less interested or suited to STEM fields compared with such levels that women actually hold of themselves. Concerning indicators of professional perceptions and gender bias, the situation was quite the contrary. Women, on almost all occasions, allocated a higher ranking to aspects of career development, promotion, and career longevity and commitment compared with men, which suggests that women maintain a deeper concern towards the challenges facing gender equality in these respects, for which men express a lower regard, thus perceiving such indicators with fewer challenges.

Table 10. Indicators demonstrating relative disagreement between the participant groups.

#	Category	Global Rank	Indicator	Rank Difference
G_2	Academic-related reasons	23	Time required	61
B_9	Professional perceptions and gender bias	53	Bias in promotion, career mobility, advancement, rewards	52
B_19	Professional perceptions and gender bias	47	Glass ceiling, suspicious views about women's abilities to progress	41
B_21	Professional perceptions and gender bias	47	Women being discouraged from the managerial positions	41
B_14	Professional perceptions and gender bias	58	General perception that women cannot hold permanent positions	54
C_5	Societal perceptions, influences, and gender stereotypes	68	Preferential treatment for men	42
D_7	Individual confidence/interest/awareness/circumstances	25	Lack of awareness of career opportunities	45
B_10	Professional perceptions and gender bias	41	Perceived lack of commitment among women	53
D_3	Individual confidence/interest/awareness/circumstances	52	Self-efficacy about STEM-related subjects	40
G_15	Academic-related reasons	64	Gender differences in math and science interest	41
D_5	Individual confidence/interest/awareness/circumstances	64	Lack of personal interest in STEM fields	45
A_17	Professional conditions and work attributes	70	Lack of women's career management skills, leadership	53
G_16	Academic-related reasons	81	Female students cope less with confusion and difficulties	48
G_18	Academic-related reasons	83	Girls show lower persistence in STEM	57

5. Conclusions

The debate on gender equality is, in principle, a challenging one. Despite general advancement in this particular issue, locally and globally, it remains contested, especially when further details are explored and different perceptions and views become more evident. Gender equality in STEM education and employment is an issue of significance, not only due to the specificity of the matter but also due to its relevance to current technological advancements and economic developments that have already marked the present age. This study aimed at exploring the key indicators affecting gender equality in STEM in Jordan, categorised to ensure relevance and consistency, to shed light on the key challenges faced on the path of its proper adoption in a manner that would provide further insights in setting future policies and actions for advancing its achievement. It mainly relied on a quantitative approach using questionnaires for evaluating and ranking a long list of indicators by participants from both genders with different academic and practical backgrounds to provide a balanced approach through diverse opinions and views. Qualitative discussions and interviews were utilised, as needed, to unpack some of the key findings of the questionnaire and build on their underlying details and justifications. While this study maintained an exploratory nature, aiming at bringing us closer to understanding the complexity of the matter, it still was able to emphasise the importance of certain key findings by assigning weights and ranks, thus providing a base for better evaluation of the reality of gender equality in STEM within the local context of Jordan.

This study's outcomes revealed numerous areas of agreement about particular indicators and, as a consequence, categories being considered most important to the debate. Areas pertaining to workplace attributes and professional conditions were seen as highly important, where the facilities, an open path to development and progression, and respect for the particular differences between men and women while still providing comparative value and contribution were seen as important and relevant. Indicators related to societal perceptions and gender stereotypes were also viewed as important and relevant, where perceptions held by society stimulating from norms and traditions were considered as a source of challenge to women participating and persisting at the workplace. A combination of notions on women's suitability to the working environment and domestic roles as a wife and/or mother maintain the ability to overshadow their equal contribution to professional life alongside men. As a consequence of the stated challenges, concerns over their impact on the self-confidence, interest, and awareness of women about STEM education and employment were also highlighted by the shared views of the participants, a matter that shows the interrelatedness, yet particularity, of the key issues circling gender equality in STEM.

The outcomes of this study may be considered as a base for further directed and articulated strategies and plans towards the successful achievement of gender equality within the context of Jordan. Further studies are encouraged to widen the base of participants for the purpose of further quantifying the key indicators and categories that would eventually result in a comprehensive and verified framework for evaluating the status of gender equality in STEM and assist in identifying areas of improvement necessary for its advancement. Such future studies may also address certain limitations the current study faces, including its emphasis on participants residing in Jordan's key cities, where participants from more rural areas could provide further insights for enriching its contents and findings. The inclusion of more PhD degree holders could also provide further insights towards further advanced education in STEM, especially at postgraduate levels. While this study drew strength from the inclusion of relevant participants sampled from actively involved academics and practitioners, providing a voice to others, such as the unemployed, could have also enriched the debate with further relevant views. Another area for improvement resides in the higher emphasis on quantitative methods compared with qualitative ones, where further exploration of deep and root causes and indicators would benefit from a more elaborate engagement with other participants through more direct and less structured research intervention. What is certain is that the topic is worthy of detailed investigation, considering the colossal benefits it promises to bring once achieved, technologically, economically, and socially, paving the way to truly sustainable development.

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References

1. UNESCO. *Boosting Gender Equality in Science and Technology: A Challenge for TVET Programmes and Careers*; UNESCO: Paris, France, 2020.
2. OECD. *Women's Economic Empowerment in Selected MENA Countries: The Impact of Legal Frameworks in Algeria, Egypt, Jordan, Libya, Morocco and Tunisia*; OECD Publishing: Paris, France, 2017. [CrossRef]
3. Dandan, M.M.; Marques, A.P. Education, employment and gender gap in MENA region. *Asian Econ. Financ. Rev.* **2017**, *7*, 573. [CrossRef]
4. Sharif, A.A.; Alshdiefat, A.; Rana, M.; Kaushik, A.; Oladinrin, T. Evaluating social sustainability in Jordanian residential neighbourhoods: A combined expert-user approach. *City Territ. Archit.* **2022**, *9*, 17. [CrossRef]
5. Sharif, A.A. A framework for social sustainability on the building level: A contextual approach. *Constr. Innov.* **2023**. *ahead-of-print*. [CrossRef]
6. Pal, K.K.; Piaget, K.; Baller, S.; Ratcheva, V.; Zahidi, S. *The Global Gender Gap Report 2022*; World Economic Forum: Geneva, Switzerland, 2022; Available online: https://www3.weforum.org/docs/WEF_GGGR_2022.Pdf (accessed on 15 June 2023).

7. OECD. *Competitiveness and Private Sector Development: Changing Laws and Breaking Barriers for Women's Economic Empowerment in Egypt, Jordan, Morocco and Tunisia*; OECD Publishing: Paris, France, 2020.
8. McKinsey and Company. *Women at Work: Job Opportunities in the Middle East Set to Double with the Fourth Industrial Revolution*; McKinsey & Company: New York, NY, USA, 2020.
9. Price Waterhouse Coopers (PWC). *MENA Women in Work Survey 2022: Young Women, Powerful Ambitions*; PWC: London, UK, 2022.
10. International Labour Organization (ILO). *Gender Equality and Decent Work in Jordan*; International Labour Organization: Geneva, Switzerland, 2021.
11. Nazier, H. Women's Economic Empowerment: An Overview for the MENA Region. In *IEMed Mediterranean Yearbook*; European Institute of the Mediterranean: Barcelona, Spain, 2019.
12. World Economic Forum. *Global Gender Gap Report 2023: Insight Report*; World Economic Forum: Geneva, Switzerland, 2023.
13. World Bank. *Women's Economic Empowerment Study*; World Bank: Washington, DC, USA, 2018.
14. Olmedo-Torre, N.; Sanchez Carracedo, F.; Salan Ballesteros, M.; Lopez, D.; Perez-Poch, A.; Lopez-Beltran, M. Do female motives for enrolling vary according to STEM profile? *IEEE Trans. Educ.* **2018**, *61*, 289–297. [CrossRef]
15. Ceci, S.; Williams, W.; Barnett, S. Women's underrepresentation in science: Sociocultural and biological considerations. *Psychol. Bull.* **2009**, *135*, 218–261. [CrossRef] [PubMed]
16. Swafford, M.; Anderson, R. Addressing the gender gap: Women's perceived barriers to pursuing STEM careers. *J. Res. Tech. Careers* **2020**, *4*, 61–74. [CrossRef]
17. Jakobs, L. The Leaky Pipeline of Women in STEM. 2022. Available online: https://digitalcommons.assumption.edu/honorstheses/100 (accessed on 2 July 2023).
18. Kessels, U.; Hannover, B. When being a girl matters less: Accessibility of gender-related self-knowledge in single-sex and coeducational classes and its impact on students' physics-related self-concept of ability. *Br. J. Educ. Psychol.* **2008**, *78*, 273–289. [CrossRef] [PubMed]
19. Friedmann, E. Increasing women's participation in the STEM industry: A first step for developing a social marketing strategy. *J. Soc. Mark.* **2018**, *8*, 442–460. [CrossRef]
20. Mukhwana, A.M.; Abuya, T.; Matanda, D.; Omumbo, J.; Mabuka, J. *Factors Which Contribute to or Inhibit Women in Science, Technology, Engineering, and Mathematics in Africa*; African Academy of Sciences: Nairobi, Kenya, 2020.
21. Dasgupta, N.; Stout, J.G. Girls and women in science, technology, engineering, and mathematics: STEMing the tide and broadening participation in STEM careers. *Policy Insights Behav. Brain Sci.* **2014**, *1*, 21–29. [CrossRef]
22. Christie, M. Gender and Persistence in STEM Careers: Predictors and Barriers. Illinois State University. 2020. Available online: https://ir.library.illinoisstate.edu/etd/1254 (accessed on 22 May 2023).
23. Hart, C.R. Women in STEM: Identifying and Lowering the Barriers. 2016. Available online: https://ttu-ir.tdl.org/items/8f4fbba7-d917-4707-a7f5-9209eb3d2cfa (accessed on 4 March 2024).
24. Schiavone, T.A. A Case Study of the Barriers Experienced and Overcome by Female Professionals in a STEM Career. Ph.D. Thesis, Northcentral University, La Jolla, CA, USA, 2021.
25. Fernández Valdez, J.; Puente Hevia, D.; Economides, A.; Perifanou, M.; Manchenko, M.; Mazaj, M.; Loucaidou, E.; Parmaxi, A.; Christou, E.; Papallas, A.; et al. Challenges and Expectations of Women in STEM: The Academic and Industrial Perspective. 2022. Available online: https://festemproject.eu/ (accessed on 27 July 2023).
26. Stoet, G.; Geary, D. The gender-equality paradox in science, technology, engineering, and mathematics education. *Psychol. Sci.* **2018**, *29*, 581–593. [CrossRef] [PubMed]
27. Henriksen, E.; Jensen, F.; Sjaastad, J. The role of out-of-school experiences and targeted recruitment efforts in Norwegian science and technology students' educational choice. *Int. J. Sci. Educ. Part B* **2015**, *5*, 203–222. [CrossRef]
28. Mainhard, T.; Oudman, S.; Hornstra, L.; Bosker, R.; Goetz, T. Student emotions in class: The relative importance of teachers and their interpersonal relations with students. *Learn. Instr.* **2018**, *53*, 109–119. [CrossRef]
29. Menacho, A.; Plaza, P.; Sancristóbal, E.; Perez-Molina, C.; Blazquez, M.; Castro, M. Halloween educational robotics. *IEEE Trans. Educ.* **2021**, *64*, 406–412. [CrossRef]
30. Warsito, W.; Siregar, N.; Gumilar, A.; Rosli, R. STEM education and the gender gap: Strategies for encouraging girls to pursue STEM careers. *Prima* **2023**, *7*, 191–205. [CrossRef]
31. Martinez, M.; Segura, F.; Andujar, J.; Ceada, Y. The gender gap in STEM careers: An inter-regional and transgenerational experimental study to identify the low presence of women. *Educ. Sci.* **2023**, *13*, 649. [CrossRef]
32. Yu, W.; He, J.; Luo, J.; Shu, X. Interventions for gender equality in STEM education: A meta-analysis. *J. Comput. Assist. Learn.* **2023**. [CrossRef]
33. Ceci, S.; Williams, W. *Why Aren't More Women in Science: Top Researchers Debate the Evidence*; American Psychological Association: Washington, DA, USA, 2007.
34. Tandrayen-Ragoobur, V.; Gokulsing, D. Gender gap in STEM education and career choices: What matters? *J. Appl. Res. High. Educ.* **2021**, *14*, 1021–1040. [CrossRef]
35. Makarova, E.; Aeschlimann, B.; Walter, H. The gender gap in STEM fields: The impact of the gender stereotype of math and science on secondary students' career aspirations. *Front. Educ.* **2019**, *4*, 60. [CrossRef]
36. Lorber, J. Using gender to undo gender: A feminist de-gendering movement. *Fem. Theory* **2000**, *1*, 79–95. [CrossRef]
37. Butler, J. *Bodies That Matter: On the Discursive Limits of "Sex"*; Routledge: New York, NY, USA, 1993.

38. Jordan Engineers Association (JEA). Annual Report 2023. 2023. Available online: www.jea.org.jo (accessed on 22 July 2023).
39. Okpala, D.C.; Aniekwu, A.N. Causes of high construction costs in Nigeria. *J. Constr. Eng. Manag.* **1988**, *114*, 233–244. [CrossRef]