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Exploring pre-service teachers' self-efficacy in practicing sustainable gender equality: a case study from Morocco

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Introduction: Teachers' self-efficacy in gender-responsive teaching plays a crucial role in fostering future generations attuned to gender equality. However, there is limited research on the effectiveness of foundational teacher training in Morocco in addressing gender equality. This study investigates the self-efficacy of pre-service teachers in implementing gender-responsive practices and examines how their social backgrounds influence their perspectives, with a focus on gender-based differences.

Methods: A quantitative survey approach was employed, using an adapted version of the Teacher Efficacy for Gender Equality Practice (TEGEP) measurement tool. The online survey was distributed to pre-service teachers in regional teacher training centers across five Moroccanregions. A total of 516 trainees participated in the study.

Results: The findings revealed: (a) significant gender disparities in family culture, household task perceptions, and traditional roles; (b) progress in fostering gender-equal learning environments; (c) a general deficiency in gender awareness and knowledge among both male and female trainees; (d) a greater readiness among female trainees to implement gender responsive teaching methods and develop gender-equitable attitudes, indicating a stronger awareness of gender equality among women.

Discussion: While progress has been made in promoting gender equality in Moroccan teacher training programs, challenges remain in addressing ingrained cultural perceptions and enhancing gender awareness. The study faced limitations related to electronic data collection, including variability in participant numbers across training centers and potential discrepancies in survey question interpretation. Based on the findings, recommendations are proposed to improve gender-responsive teaching practices in teacher training programs.

KEYWORDS

self-efficacy, pre-service teachers', sustainable gender equality, gender, Morocco

Introduction

Gender inequality in education is a global issue, with girls and women facing numerous barriers to accessing quality education. These barriers include higher dropout rates, a lack of early childhood learning opportunities, and exposure to violence and discrimination in schools (UNESCO, 2019). Gender stereotypes further hinder the educational and career paths of girls and women, limiting their potential and opportunities to reach their full potential

(OECD, 2018). Therefore, gender equality is essential for achieving sustainable development, as it improves the lives of all members of society and strengthens economies and communities (World Bank, 2020). Equal access to quality education allows girls and women to reach their full potential, fully participate in society, reduce poverty, improve health, and create a more sustainable future (Eurydice, 2020).

The United Nations's 2030 Agenda highlights the importance of quality education (SDG 4) and gender equality (SDG 5). To achieve these goals, teacher training must integrate gender-responsive pedagogy to challenge biases and promote equitable learning environments. UNESCO's, 2019–2025 strategy emphasizes the need to challenge gender stereotypes and promote gender equality in teaching and learning. However, more studies underscore the importance of addressing gender biases in education, particularly through teacher training (Brinkman et al., 2011; Finsterwald et al., 2013; Finsterwald et al., 2014; Gray and Leith, 2004; Kollmayer et al., 2020; Lamb et al., 2009; Lüftenegger et al., 2015; Schober et al., 2007).

This international context has played a significant role in advancing efforts to enhance the status of women in Morocco. Supported by royal will and government policies, Morocco has undertaken political, social, and economic reforms aimed at empowering Moroccan women to participate in various fields that were traditionally dominated by men, especially in education.

With social developments and cultural changes, promoting gender equality in society and educational institutions has become increasingly important. Gender equality is a fundamental principle of human rights and social justice, and schools play a crucial role in this promotion by providing equal opportunities for learning and growth to all students. Numerous research studies have recognized that teachers play a critical role in achieving this equality (Aina and Cameron, 2011; Gunderson et al., 2012; Heyder et al., 2020; Lubinski et al., 2000; Pedrajas and Jalandon, 2023; Tiedemann, 2000; Ziegler et al., 2006.).

The gender status of teachers is a key factor that influences their teaching experience and professional performance. In recent years, educational studies have increasingly focused on the impact of gender factors on teaching and learning practices, revealing significant disparities in gender awareness and its application in the educational field.

Teachers face multiple challenges related to their gender status in social, academic, and familial environments, which can affect their professional performance and interactions with students. Self-efficacy is an important element in effective teaching practice. Research indicates that teachers with high self-efficacy are more likely to use innovative teaching strategies, manage classrooms effectively, and build positive relationships with students. Therefore, assessing teachers' self-efficacy is crucial for ensuring sustainable gender equality in education. By evaluating their confidence in applying gender equality principles in teaching, we can identify strengths and weaknesses and provide necessary support to improve their practices (Bandura et al., 1997; Tsui, 2007).

A wide range of studies and research highlights the importance of assessing teachers' self-efficacy in this context and analyzing how it influences sustainable gender equality practices. For instance, in Miralles-Cardona et al. (2022), a scale was used to assess teachers' self-efficacy in gender equality, finding that teachers with high self-efficacy levels are more likely to adopt educational practices that promote gender equality. Similarly, in Black (2015), it has been revealed that teachers' self-reflection directly affects their behavior and teaching practices, emphasizing the importance of evaluating self-efficacy in this context.

Furthermore, Cardona-Moltó & co-authors have contributed significantly to this field. Cardona-Moltó and Miralles-Cardona (2022) emphasized that assessing teachers' self-efficacy is essential for ensuring sustainable gender equality practices in education. It also revealed differences in teachers' self-efficacy levels based on their teaching experience, gender equality training, and administrative support. It showed that teachers with greater teaching experience, who received gender equality training, or who had administrative support demonstrated higher self-efficacy in applying gender equality principles in teaching.

Kitta and Cardona-Moltó (2022) focused on students' beliefs about gender equality in university education in Greece, analyzing students' criteria for applying gender equality in teaching, while Miralles-Cardona et al. (2023) examined the readiness of future STEM (Science, Technology, Engineering, and Mathematics) teachers to integrate gender-sensitive approaches into their teaching practices. Using the Teacher Efficacy for Gender Equality Practice (TEGEP) survey tool revealed that STEM graduates from Spain and Greece felt they lacked the knowledge, skills, and attitudes necessary to effectively implement gender-sensitive teaching strategies. The study highlighted the need for training programs for future STEM teachers.

Furthermore, Miralles-Cardona (2020) developed and tested a gender-sensitive scale to assess future teachers' ability to promote gender equality in classrooms, identifying factors that affect teachers' self-efficacy regarding gender equality in the Spanish context. They recommended developing teacher training programs that enhance this self-efficacy while considering different cultural contexts. In Miralles-Cardona et al. (2023), the authors assessed teachers' self-efficacy for ensuring sustainable gender equality practices to validate the use of a self-efficacy scale to assess future teachers' ability to promote gender equality in classrooms, providing valuable insights into this topic and offering recommendations for enhancing teachers' self-efficacy in this area.

Moreover, Peleki and Nikolaou (2024) examined Greek secondary school teachers' self-efficacy and training needs regarding gender equality. They found that teachers, while expressing concern and a need for training, still hold onto patriarchal values. The study advocates for integrating gender equality practices into teacher training to promote a more equitable future.

Purpose

The 2024 Global Gender Gap Report by the World Economic Forum reveals a disappointing reality: at the current pace, it will take 137 years to achieve full gender parity. This represents minimal progress from 2023, with the Global Gender Gap Index standing at a mere 68.5% across 146 countries (Auletto, 2017; World Economic Forum, 2023).

Despite the existence of such research, there is an urgent need for further studies that deepen our understanding of the relationship between teachers' self-efficacy and sustainable gender equality practices. In this research we aim to fill this gap by providing a comprehensive study that assesses teachers' self-efficacy and its role in achieving sustainable gender equality practices in education in Morocco.

In this study, we aim to explore the level of self-efficacy among pre-service teachers in Morocco regarding gender-equal teaching. We also examine the influence of family and societal culture, as well as academic background, on their self-efficacy. The research problem

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can be articulated as follows: How do family culture, and academic background impact Moroccan pre-teachers' self-efficacy in implementing sustainable gender equality in their teaching practices?

To address this problem, the study seeks to answer the following questions:

1. How does the family and societal culture of pre-service teachers influence their approach to gender equality?
2. How does the academic background of pre-service teachers affect their approach to gender equality?
3. What is the level of pre-teachers' self-efficacy in practicing gender equality?

This study will help to explore the impact of family culture on pre-service teachers' representations of gender equality in Morocco and the impact of their academic path on this, with a focus on the differences between males and females. Furthermore, it will help to measure their self-efficacy in practicing gender equality. The investigation was carried out in 5 regions in Morocco, namely Béni Mellal-Khénifra region, Dakhla-Oued Ed-Dahab region, Drâa-Tafilalet region, Fes-Meknes region, Rabat-Salé-Kénitra region, due to the authors' affiliation to the concerned institutions.

Method

This research examines the self-efficacy of pre-service teachers in regional centers for education and training in Morocco concerning gender-responsive teaching. The following sections will describe the research tool, the data collection process, and the participants, followed by the presentation, analysis, and discussion of results, along with conclusions and recommendations.

Participants and setting

The research sample (Table 1) consisted of 516 pre-service teachers, with 311 females (60%) and 205 males (40%). Their ages range from 21 to 30 years, with an average age of 24.3 years. The age group of 22–24 years represents about 49% of the sample. Academically, 468 participants hold a bachelor's degree, while 48 hold a master's degree. Their specializations vary between primary education (approximately 40%) and secondary education (60%) across different subjects (Mathematics 27%, English 12%, French 10%, Arabic 6%, with very low percentages in Physical Sciences, Life and Earth Sciences, and Islamic Education).

The sample is distributed among three locales: urban, semi-urban, and rural. A total of 202 participants (39%) come from urban areas, 119 (23%) from semi-urban areas, and the remaining 196 (38%) from rural areas. For the urban areas, 46% were female and 28% were the males, with the opposite trend being observed for rural areas where females accounted for 29% of the sample compared to 51% for males. The ratio was quite balanced in semi-urban areas.

Geographically, trainee teachers are distributed across five regional centers for educational professions and training in Morocco. The largest number of participants is from Drâa-Tafilalet region (257; 50%), (150) of whom are females. This is followed by Dakhla-Oued Ed-Dahab region (72; 14%) with (51) females, then Rabat-Salé-Kénitra region (69; 13.4%) with (38) females. Béni Mellal-Khénifra region (64; 12.4%), where (28) are females. Finally, Fes-Meknes region (54; 10.5%), (44) of whom are females.

TABLE 1 Demographic data of participants.

Variable	*M*	SD	*n*	%
Age	24.38	2.29		
Sex				
Female			311	60.27
Male			205	39.73
Living area				
Rural			202	39.15
Semi urban			119	23.06
Urban			195	37.90
Diploma				
Bachelor's degree			468	90.70
Master's degree			48	9.30
Specialization				
Primary school			204	39.53
Secondary school			312	60.47
CRMEF				
Dakhla Oued Eddahab			72	14.00
Rabat Salé Kénitra			69	13.40
Beni Mellal Khenifra			64	12.40
Deraa Tafilalet			257	49.80
Fès Meknès			54	10.50

CRMEF, Regional Center for Education and Training of Teachers.

Measure

The research tool was developed based on the Teacher Efficacy for Gender Equality Practice (TEGEP) scale by Miralles-Cardona et al. (2022). The scale (TEGEP) consists of three criteria, each comprising several indicators, measured on a 6-point Likert scale. The scale ranges from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*). The first criterion assesses knowledge and awareness of gender issues, the second criterion evaluates the implementation of gender-responsive teaching methods, and the third criterion examines the development of gender-equitable attitudes. To explore the influence of family and environment culture, and academic background on the gender equality practices of pre-service teachers, two additional criteria —family culture and academic background— were included in the questionnaire in Arabic, to address the first two sub-questions. We translated them into English (see Appendix).

Procedures

Initially, the authors, who are native in Morocco and multilingual (Arabic/French/English), translated the original English version of the TEGEP scale into Arabic. Finally, we added the sections of family culture and academic background criteria. We developed the primary research tool as an electronic survey using Google Forms in Arabic, it was distributed to the regional

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centers for education and training across five Moroccan regions: Drâa-Tafilalet, Dakhla-Oued Ed-Dahab, Rabat-Salé-Kénitra, Béni Mellal-Khénifra, and Fès-Meknès. The survey was disseminated via social media groups, and 516 pre-service teachers voluntarily completed it. The data were analyzed using descriptive and inferential statistical techniques with SPSS 23 software. The results were then discussed, leading to conclusions regarding the gender awareness of pre-service teachers. We faced several limitations regarding survey validation, electronic data collection, the accuracy of participants' understanding of survey questions and the variability in the number of participants from each center. Finally, a set of recommendations was formulated.

Results

We presented the survey data obtained, focusing on providing a comprehensive view of how family and academic culture influence students' (future teachers) awareness and behavior toward gender equality. The results of each criterion are presented separately, with a detailed explanation and the key points that reflect the impact of these factors on teachers' self-efficacy are highlighted. Through this presentation, we draw key insights into the progress of gender awareness among this group (students during the training period) and identify areas that need reinforcement and development to improve gender equality practices in education. We also provide practical recommendations based on the results obtained to support and enhance the self-efficacy of teachers in this vital field.

Family culture

Table 2 presents the results of the first criterion C1 related to family culture and gender equality of the participants, distributed by sex.

Results from Indicator C1.1 show that the highest percentage among females is those who *agree* (5) that their fathers help with household chores, at 36%, while the highest percentage among males is those who *somewhat agree* (4). Overall, the percentage of females who *agree* that their fathers help with household chores to some extent (46) is 76% compared to 69% for males, with a difference of 7 percentage points.

In Indicator C1.2, the highest percentage among females is those who *somewhat agree* (4), at 24.44%, whereas it is 26.34% among males who *strongly agree* (5). Although the percentage is close to that of males who *somewhat agree* (4) at 24.88%, the overall analysis shows that the percentage of those *agreeing* at various levels (4–6) is 47.59% (less than half) compared to 66.83% among males (two-thirds), with a difference of 19 percentage points.

For Indicator C1.3, 26% of females *somewhat agree* (4) that male children are assigned household tasks, while among males, the highest percentage is those who *strongly agree* (5) at 26.83%, compared to a similar percentage among those who *somewhat agree* (4) at 26.34%. Overall, the percentage of those *agreeing* (4–6) is 57.56% compared to 54% among females, reflecting a clear proximity between genders in assigning household tasks to children. It is also noted that about half of the sample opposes this practice.

Indicator C1.4 results show that 25% of participants *agree* that there is discrimination between boys and girls in household tasks, with a close percentage between genders. Overall, the percentages of those *agreeing* (4–6) are 64% for males and 62% for females.

TABLE 2 Differences in family culture and gender equality by sex.

Criterion	Item in my family, I think that...	Sex	1 *n* %	2 *n* %	3 *n* %	4 *n* %	5 *n* %	6 *n* %
C1.1	My father helps with the housework.	F	25	19	31	85	112	39
			8.04	6.11	9.97	27.33	36.01	12.54
		M	18	22	24	68	56	17
			8.78	10.73	11.71	33.17	27.32	8.29
C1.2	The tasks that girls were assigned to do were female tasks.	F	38	61	64	76	49	23
			12.22	19.61	20.58	24.44	15.76	7.40
		M	10	23	35	51	54	32
			4.88	11.22	17.07	24.88	26.34	15.61
C1.3	Male children were assigned household tasks	F	41	40	62	81	71	16
			13.18	12.86	19.94	26.05	22.83	5.14
		M	21	27	39	54	55	9
			10.24	13.17	19.02	26.34	26.83	4.39
C1.4	There is a distinction between boys and girls in household tasks	F	38	43	36	62	77	55
			12.22	13.83	11.58	19.94	24.76	17.68
		M	31	22	20	49	51	32
			15.12	10.73	9.76	23.90	24.88	15.61

Scale range 1–6 (1 = Strongly Disagree, 6 = Strongly Agree). M, male; F, female.

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TABLE 3 Differences in academic path and gender equality by sex.

Criterion	Item In my academic path, I think that...	Sex	1 *n* %	2 *n* %	3 *n* %	4 *n* %	5 *n* %	6 *n* %
C2.1	Teachers adopted gender discrimination based on sex	F	99	85	45	35	37	10
			31.83	27.33	14.47	11.25	11.90	3.22
		M	61	44	35	34	22	9
			29.76	21.46	17.07	16.59	10.73	4.39
C2.2	Administrators adopted gender discrimination based on sex	F	106	83	53	33	26	10
			34.08	26.69	17.04	10.61	8.36	3.22
		M	56	48	34	34	24	9
			27.32	23.41	16.59	16.59	11.71	4.39
C2.3	Students engaged in gender-discriminatory behavior	F	76	55	47	68	53	12
			24.44	17.68	15.11	21.86	17.04	3.86
		M	38	41	33	45	33	15
			18.54	20.00	16.10	21.95	16.10	7.32
C2.4	The textbook included gender-discriminatory texts or images	F	108	86	40	39	32	6
			34.73	27.65	12.86	12.54	10.29	1.93
		M	77	49	31	28	15	5
			37.56	23.90	15.12	13.66	7.32	2.44
C2.5	Gender-related topics were discussed	F	65	51	41	59	62	33
			20.90	16.40	13.18	18.97	19.94	10.61
		M	33	44	34	35	44	15
			16.10	21.46	16.59	17.07	21.46	7.32
C2.6	Working in mixed groups (male/female)	F	18	13	21	36	123	100
			5.79	4.18	6.75	11.58	39.55	32.15
		M	6	10	20	31	84	54
			2.93	4.88	9.76	15.12	40.98	26.34
C2.7	The classrooms are organized based on sex separation	F	117	62	30	37	44	21
			37.62	19.94	9.65	11.90	14.15	6.75
		M	65	48	25	25	21	21
			31.71	23.41	12.20	12.20	10.24	10.24

Scale range 1–6 (1 = Strongly Disagree, 6 = Strongly Agree).

In conclusion, the 7-percentage point difference between males and females in the results of Indicator C1.1 indicates a clear divergence in the perception of "household chores" between male and female participants. Results from Indicator C1.2 and the large gender differences reflect a growing female perspective that household tasks are not specific to one gender, with a male desire to maintain the status quo and preserve traditional practices that differentiate household chores based on gender. This situation reflects a challenge in achieving gender equality within the family, where traditional gender roles persist.

Indicators C1.3 and C1.4 show that there is agreement between genders on certain viewpoints, indicating progress toward gender equality in some families where males are assigned traditional household tasks that were previously designated for females. However, the average percentage indicates that progress toward equality is not yet complete and requires further efforts to strengthen it. Gender discrimination remains a prevalent issue in many families, where household roles are assigned based on gender. The persistence of this pattern poses a major challenge to achieving gender equality.

Academic path

Table 3 presents participants' responses to the indicators of the second criterion C2 related to the academic path, segmented by sex.

Indicator C2.1 from the Academic path criterion shows that the highest percentage of participants *strongly oppose* that teachers adopt gender discrimination, with 30% of females and 32% of males holding this view. The same trend is observed in Indicator C2.2, with a widening gap: 34% of females and 27% of males *strongly oppose* that administrators adopt gender discrimination. Overall, the percentage of those *opposing* (1–3) in Indicator C2.1 is 74% for females and 68% for males, compared to 77% for females and 67% for males in Indicator C2.2. This reflects an increasing awareness of the importance of

gender equality in the academic environment, where both teachers and administrators recognize the importance of providing a fair and unbiased educational environment (Table 3).

Regarding Indicators C2.3 and C2.5, there is a divergence in perspectives. For Indicator C2.3, 24% of females *strongly opposed* (1) the statement that "students engage in gender-discriminatory behavior," while 22% *somewhat agreed* (4). Conversely, among males, 22% *somewhat agreed* (4) and 19% *strongly opposed* (1). Similarly, for Indicator C2.5, which concerns "discussing gender topics," 21% of females *strongly opposed* (1) while 20% *agreed* (5). Among males, 21% *opposed* (2) and the same percentage *agreed* (5). This division is more apparent in the overall percentages, with 57% of females and 55% of males *opposing* Indicator C2.3, and 50% of females and 54% of males *opposing* Indicator C2.5. These percentages are close to half of the participants in both genders. This division may result from differences in participants' understanding of the indicators or the influence of other variables on their responses, necessitating further analysis for a deeper understanding.

For Indicators C2.4, C2.6, and C2.7, participants' responses are very clear and closely aligned between genders. For Indicator C2.4, regarding whether textbooks contain gender-discriminatory texts or images, the highest percentage of *strong opposition* is 35% for females and 38% for males. For Indicator C2.6, concerning whether group work is conducted in a mixed-gender format, the highest percentage of *agreement* (5) is 40% for females and 41% for males. For Indicator C2.7, concerning whether classroom organization relies on gender separation, the highest percentage of *strong opposition* is 38% for females and 32% for males. Overall, the percentages of those *opposing* (1–3) Indicator C2.4 are 75% for females and 77% for males, and for Indicator C2.7, 67% for both genders. The percentage of those *agreeing* (4–6) with Indicator C2.6 is 83% for females and 82% for males. These percentages range from two-thirds to three-quarters of participants.

In conclusion, the results of the second criterion indicators demonstrate that the efforts to create a suitable educational environment in Morocco have made an important progress in terms of how educational and administrative staff handle gender issues, as well as in the composition of textbooks and classroom organization to achieve gender equality.

Knowledge and awareness

Table 4 presents the results of participants' responses to the indicators of the third criterion related to gender knowledge and awareness, segmented by gender.

The results of Indicator C3.1 regarding the ability to define, describe, recognize, understand, and distinguish gender-related terms show that 28% of females *strongly agree* (5), and the same percentage *somewhat agree*, compared to 24 and 23% of males in the same categories. The rate of those *agreeing* (4–6) is 62% for females compared to 58.54% for males. A review of the percentages for other indicators in this criterion reveals a similar alignment between genders, except for Indicator C3.5 concerning the application of equal opportunities for both genders. Here, the percentage of *agreement* (4–6) is high, with 83% for females compared to 78% for males, showing a 5-percentage point difference, indicating a greater readiness among females to implement gender equality.

However, other indicators show a fluctuation between majorities of opposition and majorities of agreement with minimal differences. For example, the percentage of those *opposing* (1–3) Indicator C3.10, "I can define, describe, recognize, understand, and distinguish gender inequality," reaches 60% for both genders. Meanwhile, the percentage of those *agreeing* (4–6) with Indicator C3.4, "I can define, describe, recognize, understand, and distinguish gender roles," is 55%, reflecting what we consider a weakness in gender knowledge among participants that is not fully represented by the percentages.

Implementing gender-responsive methods

Table 5 presents the results of participants' responses to the fourth criterion related to implementing gender-responsive methods, segmented by sex.

It is observed that the highest percentages for all indicators were recorded for the maximum values (*Agree* = 5, *Strongly Agree* = 6) for both genders, indicating that participants are confident in their ability to implement gender-responsive teaching methods. The highest percentages of *agreement* among females were recorded for Indicator C4.1, "Providing equal opportunities for all my students," at 51% for those who *strongly agree* (6), followed by Indicator C4.6, "Creating educational environments that promote gender cooperation," at 50% for the same group. There are notable differences compared to males, with 48% for Indicator C4.1, showing a 3-percentage point gap, and 42% for Indicator C4.6, with an approximate 8 percentage point difference.

Conversely, the lowest percentages of agreement were recorded for Indicator C4.4, "Taking necessary actions to reduce or maintain disparities," at 22% for females who *agree* (5), compared to 23% for males. This is followed by Indicator C4.3, "Generalizing gender perspectives in lesson content and resources," with 26% for females and 27% for males in the same category, and Indicator C4.2, "Planning teaching strategies from a gender perspective," with the same percentage for females and 28% for males.

Overall, the percentages of those *agreeing* (4–6) with the indicators among females range from 89% for Indicator C4.6 to 59% for Indicator C4.4, while for males, the range is from 80% for Indicator C4.5 to 53% for Indicator C4.4. Comparing the overall percentages between genders, we observe that the difference in Indicator C4.6 is 10 percentage points, expanding to a maximum of 15 points in Indicator C4.8, while the smallest difference is recorded for Indicator C4.3, with less than one percentage point. This indicates that there are variations between genders in the readiness to implement gender-responsive teaching methods, with a notable advantage for females.

Developing gender attitudes

Table 6 presents the results of participants' responses to the criterion on developing gender attitudes, segmented by sex.

It is noted that the highest percentages of strong agreement and agreement were recorded for all indicators in this criterion, with the highest recorded for Indicator C5.4, "Advocating against all forms of gender injustice," at 45% for females who *strongly agree* (6), compared to 41% for males in the same category. This is followed by Indicator C5.5, "Supporting links between school and community to promote

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TABLE 4 Differences in gender knowledge and awareness by sex.

Criterion	Item I can (define, describe, identify, recognize, differentiate, etc.) …	Sex	1 *n* %	2 *n* %	3 *n* %	4 *n* %	5 *n* %	6 *n* %
C3.1	Terminology related to gender issues	F	36	47	35	86	86	21
			11.58	15.11	11.25	27.65	27.65	6.75
		M	23	29	33	47	49	24
			11.22	14.15	16.10	22.93	23.90	11.71
C3.2	Legislation on gender equity	F	32	47	50	74	80	28
			10.29	15.11	16.08	23.79	25.72	9.00
		M	26	28	35	57	39	20
			12.68	13.66	17.07	27.80	19.02	9.76
C3.3	Gender equality *vs.* gender equity	F	44	31	48	72	83	33
			14.15	9.97	15.43	23.15	26.69	10.61
		M	30	27	29	53	50	16
			14.63	13.17	14.15	25.85	24.39	7.80
C3.4	Gender roles	F	37	49	54	78	76	17
			11.90	15.76	17.36	25.08	24.44	5.47
		M	24	30	38	49	44	20
			11.71	14.63	18.54	23.90	21.46	9.76
C3.5	Equal opportunities applied to gender	F	19	16	17	54	107	98
			6.11	5.14	5.47	17.36	34.41	31.51
		M	8	12	25	38	64	58
			3.90	5.85	12.20	18.54	31.22	28.29
C3.6	Gender discrimination	F	98	67	31	55	46	14
			31.51	21.54	9.97	17.68	14.79	4.50
		M	62	45	26	32	25	15
			30.24	21.95	12.68	15.61	12.20	7.32
C3.7	Gender parity	F	22	27	34	72	96	60
			7.07	8.68	10.93	23.15	30.87	19.29
		M	16	19	24	50	62	34
			7.80	9.27	11.71	24.39	30.24	16.59
C3.8	Gender bias	F	85	60	47	55	44	20
			27.33	19.29	15.11	17.68	14.15	6.43
		M	51	50	33	29	25	17
			24.88	24.39	16.10	14.15	12.20	8.29
C3.9	Sex and gender	F	59	70	51	56	51	24
			18.97	22.51	16.40	18.01	16.40	7.72
		M	36	38	34	42	32	23
			17.56	18.54	16.59	20.49	15.61	11.22
C3.10	Gender inequalities	F	104	49	33	52	49	24
			33.44	15.76	10.61	16.72	15.76	7.72
		M	60	39	25	33	27	21
			29.27	19.02	12.20	16.10	13.17	10.24
C3.11	Gender stereotypes	F	36	47	35	86	86	21
			11.58	15.11	11.25	27.65	27.65	6.75
		M	23	29	33	47	49	24
			11.22	14.15	16.10	22.93	23.90	11.71

Scale range 1–6 (1 = Strongly Disagree. 6 = Strongly Agree). M, male; F, female.

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TABLE 5 Differences in implementing a gender-responsive pedagogy by sex.

Criterion	Item I am confident in …	Sex	1 *n* %	2 *n* %	3 *n* %	4 *n* %	5 *n* %	6 *n* %
C4.1	Providing equal opportunities to all my students.	F	36	47	35	86	86	21
			11.58	15.11	11.25	27.65	27.65	6.75
		M	23	29	33	47	49	24
			11.22	14.15	16.10	22.93	23.90	11.71
C4.2	Planning strategies to teach with a gender perspective.	F	32	47	50	74	80	28
			10.29	15.11	16.08	23.79	25.72	9.00
		M	26	28	35	57	39	20
			12.68	13.66	17.07	27.80	19.02	9.76
C4.3	Mainstreaming gender into course content and materials.	F	44	31	48	72	83	33
			14.15	9.97	15.43	23.15	26.69	10.61
		M	30	27	29	53	50	16
			14.63	13.17	14.15	25.85	24.39	7.80
C4.4	Taking action to prevent the reproduction or maintenance of inequalities.	F	37	49	54	78	76	17
			11.90	15.76	17.36	25.08	24.44	5.47
		M	24	30	38	49	44	20
			11.71	14.63	18.54	23.90	21.46	9.76
C4.5	Respecting the different gendered needs and styles of learning.	F	19	16	17	54	107	98
			6.11	5.14	5.47	17.36	34.41	31.51
		M	8	12	25	38	64	58
			3.90	5.85	12.20	18.54	31.22	28.29
C4.6	Creating learning environments that foster gender collaboration.	F	98	67	31	55	46	14
			31.51	21.54	9.97	17.68	14.79	4.50
		M	62	45	26	32	25	15
			30.24	21.95	12.68	15.61	12.20	7.32
C4.7	Designing. implementing. and assessing lesson plans with a gender perspective.	F	22	27	34	72	96	60
			7.07	8.68	10.93	23.15	30.87	19.29
		M	16	19	24	50	62	34
			7.80	9.27	11.71	24.39	30.24	16.59
C4.8	Involving families in the implementation of school-home gender equality plans.	F	85	60	47	55	44	20
			27.33	19.29	15.11	17.68	14.15	6.43
		M	51	50	33	29	25	17
			24.88	24.39	16.10	14.15	12.20	8.29
C4.9	Collaborating with colleagues in gender equality plans implementation.	F	59	70	51	56	51	24
			18.97	22.51	16.40	18.01	16.40	7.72
		M	36	38	34	42	32	23
			17.56	18.54	16.59	20.49	15.61	11.22
C4.10	Educating on gender issues.	F	104	49	33	52	49	24
			33.44	15.76	10.61	16.72	15.76	7.72
		M	60	39	25	33	27	21
			29.27	19.02	12.20	16.10	13.17	10.24

Scale range 1–6 (1 = Strongly Disagree. 6 = Strongly Agree). M, male; F, female.

gender equality," with 39% for females who *strongly agree* (6), compared to 34% for males. The lowest percentage among females was recorded for Indicator C5.3, "Addressing tolerance toward gender discrimination and violence," with the highest at 26.69% for those who *agree* (5), compared to 27.32% for males. The lowest percentage for males was recorded for Indicator C5.1, "Promoting attitudes that recognize gender differences," at 26.83%, compared to 27.65% for females.

TABLE 6 Differences in developing gender attitudes by sex.

Criterion	Item I am able to …	Sex	1 *n* %	2 *n* %	3 *n* %	4 *n* %	5 *n* %	6 *n* %
C5.1	Convey/instill gender-sensitive attitudes.	F	41	31	23	59	86	71
			13.18	9.97	7.40	18.97	27.65	22.83
		M	21	24	32	36	55	37
			10.24	11.71	15.61	17.56	26.83	18.05
C5.2	Deconstruct gender stereotypes and prejudice.	F	27	29	21	57	95	82
			8.68	9.32	6.75	18.33	30.55	26.37
		M	16	20	22	38	67	42
			7.80	9.76	10.73	18.54	32.68	20.49
C5.3	Confront existing tolerance toward gender discrimination and violence.	F	34	30	23	60	83	81
			10.93	9.65	7.40	19.29	26.69	26.05
		M	16	27	29	31	56	46
			7.80	13.17	14.15	15.12	27.32	22.44
C5.4	Advocate against all forms of gender injustice.	F	17	14	17	26	99	138
			5.47	4.50	5.47	8.36	31.83	44.37
		M	11	9	19	21	60	85
			5.37	4.39	9.27	10.24	29.27	41.46
C5.5	Support school-community links to promote gender equality.	F	17	12	15	50	95	122
			5.47	3.86	4.82	16.08	30.55	39.23
		M	11	16	19	25	71	63
			5.37	7.80	9.27	12.20	34.63	30.73

Scale range 1–6 (1 = Strongly Disagree. 6 = Strongly Agree). M, male; F, female.

Overall, the highest percentage of *agreement* (4–6) was recorded for Indicator C5.5 among females at 86% compared to 78% for males, with an 8 percentage point difference. The highest percentage for males was recorded for Indicator C5.4 at 81%, compared to 85% for females, with a 3.6 percentage point difference. The lowest percentages of agreement were recorded for Indicator C5.1, with 69% for females compared to 62% for *males*, showing a 7 points difference. This indicates that females are more prepared to develop gender-responsive attitudes than males, with differences ranging from 4 points for Indicators C5.2 and C5.4 to 8 points for Indicator C5.5.

Discussion

This study investigated three key dimensions of pre-service teachers' self-efficacy in practicing sustainable gender equality in Morocco: the influence of family and community culture, the impact of academic pathways, and overall self-efficacy levels in gender equality practices. The findings reveal complex interactions between cultural traditions and emerging progressive attitudes toward gender equality in education.

Regarding the first dimension, our findings revealed a significant gender-based divergence in perceptions of household responsibilities, with female participants demonstrating heightened awareness of gender equality practices while male participants maintained more traditional, patriarchal views. This aligns with Peleki and Nikolaou's (2024) findings in the Greek context, suggesting that traditional gender roles persist across different cultural contexts in teacher preparation programs. This pattern also reflects broader challenges identified by UNESCO (2019) regarding the persistent influence of gender stereotypes in educational settings.

The study's second focus on academic pathways' impact on gender equality representations yielded modest effects, indicating the successful implementation of gender-inclusive educational policies in Morocco. This finding contrasts with international literature, such as Miralles-Cardona et al. (2023), which found significant variations based on academic background, particularly in STEM fields. The difference may reflect Morocco's concentrated efforts to create gender-supportive educational environments, as outlined in recent national reforms.

The core investigation of pre-service teachers' self-efficacy levels revealed complex patterns. While participants showed mixed understanding of gender-related concepts and terminology, they demonstrated high readiness to implement gender equality practices, particularly among female participants. This finding partially diverges from Miralles-Cardona et al.'s (2023) research, which found lower levels of preparedness among pre-service teachers in Spain and Greece, especially regarding knowledge of gender terminology and legislation. The higher implementation readiness among Moroccan pre-service teachers suggests that recent national initiatives may be effectively fostering practical gender-responsive teaching approaches.

The gender disparity in preparedness for developing gender-responsive attitudes echoes findings from earlier studies (Lubinski et al., 2000; Gunderson et al., 2012) that identified gender as a significant factor in teachers' approach to equality issues. However, our findings suggest a more nuanced picture in the Moroccan context, where female pre-service teachers' higher preparedness levels may reflect both increasing professional empowerment and persistent cultural influences.

These findings contribute to the broader literature on teacher self-efficacy and gender equality practice (Bandura et al., 1997; Tsui, 2007) by highlighting how cultural context shapes the development of gender-responsive teaching practices. The study also extends Cardona-Moltó and Miralles-Cardona's (2022) work on the relationship between teaching experience and self-efficacy by examining these dynamics in pre-service teachers, suggesting that gender awareness may develop before formal teaching experience begins.

Limitations

There are several limitations that must be considered in this research. First, translations from English to Arabic and vice versa are not reliable, and we believe this may affect the validity and replicability of the study. Second, although the data collection was done entirely electronically, the participants' understanding of some questions may not be at the same level, which may affect the accuracy of the answers provided, as we noted in the third criterion. Third, the large disparity between the number of participants from the five regions and the ratio of participants to the number of students in the same center remains variable, due to the fact that the response to the questionnaire was subjective and independent, and we recorded a wide response in Draa-Tafilalet region compared to other regions of the same size such as Fez-Meknes region or Rabat-Salé-Kénitra region and Beni Mellal-Khenifra region. This fact may limit the generalization of the results, but the relatively large sample size may help address the issue. Fourth, the training at CRMEF is not limited to the people of that region only but may include students from outside the region in specializations that do not exist in their region or because they have recently settled in the region, which may affect the regional analysis of the results, which is what prompted us to exclude it in this study. Fifth, the different demographic characteristics of the samples representing the five regions prevented a deeper analysis of the results, based on geographical area, local environment, or specialization, which could be better studied by subsequent studies.

Recommendations

Based on our findings and their alignment with existing research, we recommend a three-tiered approach to enhancing gender equality practices in Moroccan teacher education.

First, integrate comprehensive gender equality training into teacher preparation programs, focusing specifically on gender concepts, legislation, and practical classroom strategies, and develop research initiatives at Regional Centers for Education and Training Professions (CRMEF) to continually assess and improve gender-responsive teaching practices. Second, review and revise curriculum materials to ensure balanced gender representation and implement structured mentoring programs pairing experienced gender-responsive teachers with pre-service teachers. Third, establish partnerships between educational institutions and community organizations to promote gender equality awareness and create forums for open dialogue about gender issues in education, involving all stakeholders in the educational community.

These recommendations aim to address the gaps identified in our study while building on existing strengths in Morocco's educational system, ultimately working toward sustainable gender equality.

Conclusion

The results show that family culture in Morocco (specifically in the regions covered by the study sample) exhibits diversity in practices related to gender equality. The study indicates differences in perceptions of "household chores" between females and males, with females showing a greater tendency toward equality in task distribution, while males show a preference for maintaining traditional practices that differentiate tasks based on gender. Despite some progress in assigning household tasks to males, traditional gender roles persist in many families, with gender discrimination in task distribution posing a major challenge to achieving gender equality. These results underscore the need for increased efforts to enhance awareness of the importance of gender equality within the family and to change customs and traditions that impede the achievement of actual equality, amidst the positive transformations occurring in Morocco.

Regarding the academic environment, the analysis of the Gender Equality Pedagogical Competence (TEGEP) scale reveals a great progress toward achieving gender equality in Morocco, with most teachers and administrators strongly rejecting any form of gender discrimination. This increasing awareness of the importance of equality fosters a fair and unbiased educational environment, and educational materials are starting to reflect gender equality values. There is also relative openness to discussing gender issues within classrooms. However, students' opinions on gender discrimination in behaviors and gender discussions remain varied, which may be due to differences in familiarity with advanced concepts such as gender discrimination and bias among students. This indicates a strong foundation that can be built upon to enhance gender knowledge and awareness and highlights the ongoing need for educational efforts to create actual equality at all levels.

The study also indicates a clear readiness among both females and males to adopt gender-responsive teaching methods in the educational environment and to develop gender-responsive attitudes. Females show a greater willingness to implement practices that promote gender equality and collaboration between school and community. This readiness reflects a positive shift toward creating a safer, more inclusive, and fair educational environment and a heightened sense of the need for gender equality among females. Despite this readiness, there is still a pressing need to continue efforts to develop teaching practices in this area.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

AD: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Software, Validation, Writing – original draft, Writing – review & editing, Resources, Visualization. JG: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing. AT: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing. MO: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing. SH: Conceptualization, Funding acquisition, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that no Gen AI was used in the creation of this manuscript.

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Supplementary material

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