International Journal of Innovative Research and Scientific Studies, 8(6) 2025, pages: 303-311

IJIRSS
International Journal of Innovative Research & Scientific Studies

ISSN: 2617-6548

URL: www.ijirss.com

Female students' perceptions of gender-focused mentoring and its influence on academic performance at a higher technological institute in Lima, Peru

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Abstract

This study investigates female students' perceptions of a gender-focused mentoring program and how it influences academic performance in a higher technological institute in Lima, Peru. A quantitative, descriptive-analytical design was used. A structured Likert-scale questionnaire was administered to 100 female students from technical programs in Civil Construction and Sanitation. The instrument measured three core dimensions: support and empowerment, mentoring process quality, and perceived academic impact. The instrument achieved high validity (Aiken's V = 0.99) and reliability (Cronbach's alpha > 0.7). Results indicate a positive perception of the mentoring program, especially in terms of emotional support, increased self-confidence, and academic motivation. Weaknesses were noted in the frequency and duration of sessions. Gender-sensitive mentoring plays a crucial role in enhancing female students' performance and sense of belonging in technical fields. Findings support scaling such programs to address gender gaps in technical education and promote inclusive academic environments.

Keywords: Academic performance, Academic self-efficacy, Content validity, Female empowerment, Gender-sensitive mentoring, Reliability, Student perception.

DOI: 10.53894/ijirss.v8i6.9588
Funding: This study received no specific financial support.
History: Received: 2 July 2025 / **Revised:** 4 August 2025 / **Accepted:** 6 August 2025 / **Published:** 1 September 2025

Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Institutional Review Board Statement: The Ethical Committee of the Higher Technological Institute of Lima, Peru has granted approval for this study (Ref. No. 02-2024-CTI).
Publisher: Innovative Research Publishing

1. Introduction

In the landscape of higher technical education, gender disparities remain pronounced, especially in fields traditionally dominated by men, such as construction and sanitation [1]. Women pursuing careers in these areas confront not only academic obstacles but also entrenched sociocultural and institutional barriers that hinder their progression and retention [2].

Mentoring with a gender perspective has gained traction as an educational strategy to close these gaps, offering personalized academic, emotional, and vocational support [3]. Rooted in educational psychology, the theoretical underpinnings of gender-sensitive mentoring are drawn from Vygotsky [4] sociocultural theory, Bandura [5] concept of self-efficacy and social constructivism. These frameworks collectively emphasize the role of contextual, social, and psychological variables in academic success.

International studies affirm the positive correlation between mentoring and improved academic performance and emotional well-being in female students, particularly in male-dominated disciplines [6, 7]. Research also highlights mentoring's contribution to reducing dropout rates and improving self-esteem among women in STEM fields [8, 9].

Despite these findings, in Peru, there is a scarcity of empirical evidence on the effects of gender-focused mentoring in technical careers related to construction and sanitation. This research aims to fill that gap by exploring how female students perceive the mentoring program implemented at a higher technological institute in Lima and how these perceptions correlate with their academic outcomes.

2. Methodology

This research employed a quantitative, descriptive-analytical design. The population consisted of female students enrolled in Civil Construction and Sanitation programs (cycles I to VI) at a public technological institute in Lima. The study used a structured questionnaire titled: "Perceptions of Gender-Focused Mentoring and Its Influence on Academic Performance."

The instrument comprised 30 Likert-scale items distributed across three dimensions and nine indicators. Validated by expert judgment using Aiken's V (0.99), the questionnaire also demonstrated high internal consistency with a Cronbach's alpha exceeding 0.70.

Ethical Considerations: Ethical protocols were followed, including informed consent, anonymization of responses, and voluntary participation. Institutional permission was obtained from the institute's director.

Data was collected from a stratified sample of 100 students across various academic cycles. Sessions were coordinated within class time to maximize participation and minimize disruption.

In the context of technical higher education, gender gaps persist, especially in traditionally male-dominated fields such as construction and sanitation [1]. Women who pursue these careers face not only academic challenges but also social, cultural, and structural barriers that affect their performance and retention [2].

Gender-sensitive mentoring has emerged as a promising strategy to promote equity and improve the academic performance of women in technical sectors [3]. This practice is based on the creation of educational support links between students and professionals or professors who provide academic, psycho-emotional, and vocational guidance [10].

From a psycho pedagogical perspective, this intervention is based on situated learning [4, 11], sociocultural approach and social constructivism, which emphasize the importance of the environment and social mediation in cognitive and academic development. It also integrates [5] self-efficacy model, which is key to explaining how mentoring strengthens students' academic confidence.

Previous studies have shown that mentoring programs positively impact motivation, a sense of belonging, and academic performance, especially in contexts of gender inequality [6, 7].

In Peru, emerging research points to the positive impact of these programs in higher technological education [8]. A direct precedent is the study by Valverde [9], which analyzed a mentoring program in engineering programs, demonstrating improvements in participants' academic averages and self-esteem. Another example is the work by Rivera [12] in technological institutes in the north of the country, where a reduction in female dropout rates was reported after the implementation of gender-sensitive mentoring.

Despite these advances, there is still little evidence in the field of technical programs linked to the construction and sanitation sectors. Within this framework, this research aims to analyze female students' perceptions of gender-focused mentoring and how it influences academic performance at a higher technological institute in Lima, Peru.

Based on my experience in the field of education, I have noticed that women who receive education above the basic level, that is, those who reach the higher technological or university level, have better job opportunities, start their own businesses, and contribute to the growth of the economies of their locality, region, or country. Currently, there is much talk about empowerment and gender equality, and education becomes a powerful tool to achieve this, to challenge discriminatory social norms and gender stereotypes that are very harmful to our society.

In recent years, the active role and participation of women in the political, economic, and social life of Peru have been crucial for sustained development and growth. As the main promoters of well-being within their families and social environments, they contribute to economic growth with real inclusion. Thus, Peruvian women are increasingly gaining a greater role. Their drive, courage, sacrifice, dedication, struggle, work, and perseverance are validating the research being conducted on the subject, which has led to great progress in our country in recognizing and guaranteeing the rights of women in all their diversity.

Peru has had a National Gender Equality Policy since 2019, the fundamental objective of which is to eradicate structural discrimination against women, which is expressed in the violation of their rights. Higher technological education

is no exception to this, as the Construction and Sanitation sector in our country is of vital importance, not only because it encompasses mega-infrastructure projects that boost the economy through increased investment and their relationship with other industries, but also because, more importantly, it addresses the urgent need to train and incorporate female talent in a historically male-dominated sector. This is to ensure that women continue to hold positions, even in professions that were previously the sole preserve of men. Therefore, higher technological education is vital to respond to these high demands, taking into account the laws that protect gender equality in all aspects for the rapid incorporation of women into the labor market, with adequate professional training that is reflected in excellent academic performance compared to men (https://www.minedu.gob.pe/superiortecnologica/), which is why this proposal was born with the following question:

What are female students' perceptions of gender-focused mentoring and how does it influence academic performance at a higher technological institute in Lima, Peru?

Therefore, the objectives are: General objective: To analyze female students' perceptions of gender-focused mentoring and how it influences academic performance. Specific objectives: (1) To identify the key dimensions of gender-focused mentoring valued by female students in their technical training process. (2) To evaluate how gender-focused mentoring contributes to students' empowerment, motivation, and self-confidence in the academic field. (3) To determine the relationship between gender-focused mentoring and its influence on the academic performance of female students in technical programs. (4) To examine the quality and adequacy of the mentoring process from the students' perspective, including frequency, content, and relationship with the mentor. (5) To propose recommendations based on students' perceptions and expressed needs to strengthen gender-focused mentoring programs in higher technical education institutions.

This study presents a quantitative approach, with a descriptive-analytical design and sociodemographic variables (age and training levels). The population consists of female students enrolled in technical programs in Civil Construction and Sanitation (first to sixth cycles) at a higher technological institute in Lima, Peru.

The instrument used is called the Questionnaire on Female Students' Perceptions of Gender-Based Mentoring and How It Affects Academic Performance at a Higher Technological Institute in Lima, Peru. It has three dimensions, nine indicators, and 30 items.

Table 1.
The psychometric properties of this article, I summarize.

Property	Technique	Result	Level
Validity	V for Aiken	0.99	Very high
Reliability	Cronbach's alpha	> 0.70	High
Dimensions	3	—	Well defined
Indicators	9	—	Please specify
Scale	Likert (1–5)	—	Adequate

The questionnaire uses a Likert scale with the following rating values: 1. Never, 2. Almost never, 3. Sometimes, 4. Almost always, 5. Always.

Ethical Aspects: Informed consent was obtained, and respect for the principles of autonomy was maintained. Participants were informed about voluntary participation, anonymity, and data confidentiality.

Procedure:

In conducting this research, authorization was requested from the director of the higher technological institute under study for the respective permission.

The instrument used is a questionnaire on female students' perceptions of gender-focused mentoring and how it influences academic performance at a higher technological institute in Lima, Peru. The questionnaire will use Likert-type responses and will undergo statistical analysis for validation and reliability before being administered.

To collect the data, the questionnaire was administered in classrooms throughout the different study cycles (I to VI). The pilot sample size was 100 female students from various technical and professional programs at the higher technological institute under study, while maintaining the confidentiality and anonymity of the students.

3. Results

The descriptive statistics derived from the instrument provide insights into students' perceptions.

Table 2 presents the average values per item, ranging from 3.44 to 4.07, with the highest rating attributed to the sense of safety in expressing personal concerns and the practical application of theoretical knowledge. The lowest score relates to insufficient time in mentoring sessions**.**

Table 2.
Average value of female students' perception of gender-focused mentoring and how it influences academic performance, according to item.

ITEM	CODING	VALOR PROMEDIO
Do you feel that mentoring has provided support in addressing the challenges you've experienced as a woman in your technical career?	I1	3.89
Can you share how the experience gained through mentoring has helped you manage situations related to discrimination or gender bias?	I2	3.89
Have topics related to gender equality been addressed in your mentoring sessions, and do you feel they have had an impact on you?	I3	3.77
Do you feel you have a safe space to express your concerns and worries as a woman during mentoring?	I4	4.07
Can you confirm that mentoring has influenced your motivation to continue and excel in your technical career?	**I5**	3.65
Do you feel that mentoring has helped you challenge or question the gender stereotypes that exist in your field of study?	I6	3.85
Have you noticed changes in your participation in classes or projects since receiving mentoring?	I7	3.78
Do you consider your mentor a positive role model for you as a woman in a technical career?	I8	3.7
Do you feel that mentoring has helped you visualize opportunities for success for women in your field?	I9	3.77
Do you feel that the relationship with your mentor strengthens your sense of belonging to the female technical community?	I10	3.74
Do you feel you have enough time during the sessions to express your concerns and receive guidance?	I11	3.44
Does mentoring fit with your schedule and availability?	I12	3.68
Do you feel that the topics covered in mentoring contribute to your experience as a woman in technical education?	I13	3.65
Does mentoring include content related to gender equality and equity that you find useful?	I14	3.77
Have the topics covered helped you improve your academic and professional development?	I15	3.82
Do you receive practical tools during mentoring that you can apply to your training?	I16	3.7
Do you feel comfortable and listened to during mentoring sessions?	I17	3.8
Do you feel your mentor understands and values your experiences as a woman in a technical environment?	I18	3.83
Does your relationship with your mentor generate confidence in you to share your concerns and difficulties?	I19	3.88
Are you satisfied with the support and quality of the guidance you receive?	I20	3.85
Have you noticed any improvement in your grades or academic performance since participating in mentoring?	I21	3.85
Has mentoring helped you better organize your time and academic activities?	I22	3.67
Do you feel the guidance you receive influences your evaluations and technical projects?	I23	3.8
Do you think mentoring has had a significant impact on your overall academic performance?	I24	3.88
Have you acquired study techniques or technical skills thanks to mentoring?	I25	3.7
Has mentoring helped you apply theoretical knowledge to professional practice?	I26	3.96
Do you feel better prepared to solve complex technical problems after mentoring?	I27	3.8
Do you feel that mentoring contributes to your ability to learn and apply technical content?	I28	3.8
Do you feel more confident participating in technical projects and activities thanks to mentoring?	I29	3.73
Do you confidently face the challenges of your technical training thanks to mentoring?	I30	3.81

Figures 1, 2, and 3 visually depict the respective tables. These results underscore the mentoring program's relevance, especially in fostering a supportive environment and improving academic confidence.

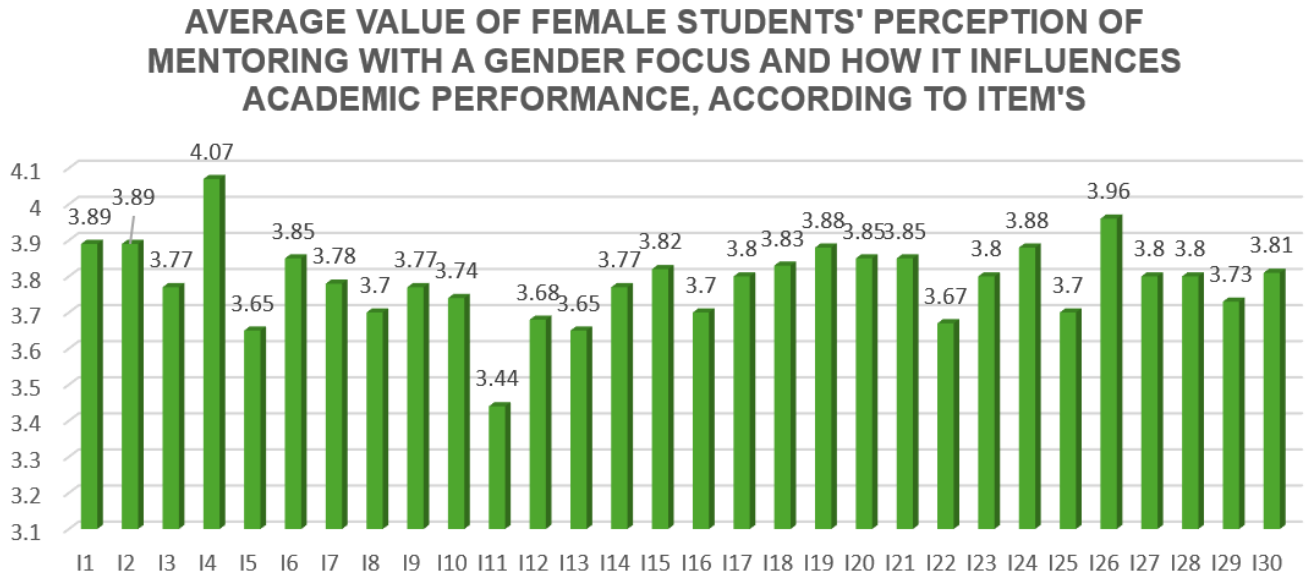

Figure 1.
Average value of female students' perception of gender-focused mentoring and how it influences academic performance, by item.

Interpretation:
The highest values are:
ITEM 4: 4.07
ITEM 26: 3.96

It means that students feel they are in a safe space to express their concerns and worries as women, and that mentoring has helped them apply theoretical knowledge to professional practices, almost always.

The lowest value is;
ITEM 11: 3.44

It means that only sometimes during mentoring sessions do they feel they have enough time to express their concerns and receive guidance.

Table 3.
Outlines the average values by indicator. Emotional and academic support to confront gender-related barriers scored the highest (3.91), while the frequency of mentoring sessions scored the lowest (3.56).

Average perception of female students regarding gender-focused mentoring and how it influences academic performance, according to indicators.

Indicators	**Coding**	**Average Value**
Specific emotional and academic support to address gender barriers	INDICATOR 1	3.91
Strengthening self-confidence and motivation.	INDICATOR 2	3.76
Identification with the mentor as a role model	INDICATOR 3	3.74
Average frequency of meetings or sessions	INDICATOR 4	3.56
Relevance and adequacy of the topics addressed	INDICATOR 5	3.74
Satisfaction with the mentor-mentee relationship	INDICATOR 6	3.84
Perception of improvement in grades or academic performance	INDICATOR 7	3.8
Increased technical skills and study strategies	INDICATOR 8	3.82
Motivation and confidence to face academic and professional challenges	INDICATOR 9	3.77

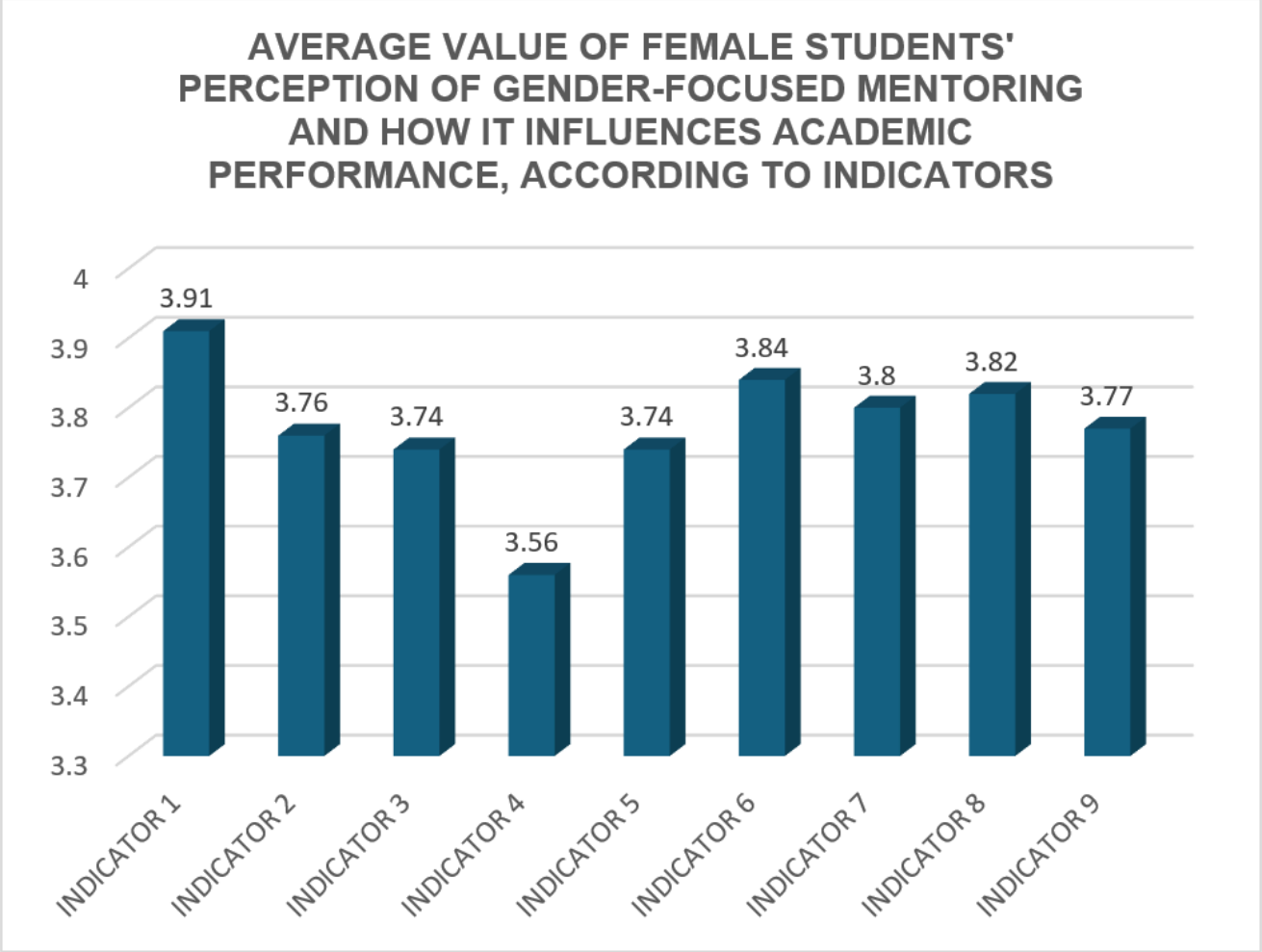

Figure 2.
Average perception of female students regarding gender-focused mentoring and how it influences academic performance according to indicators.

Interpretation:

The highest value is:
INDICATOR 1: 3.91

This means that specific emotional and academic support to address gender barriers has almost always helped improve academic performance.

The lowest value is;
INDICATOR 4: 3.56

This means that only sometimes did the average frequency of meetings or mentoring sessions help them excel in their academic performance.

Table 4.
Aggregates perceptions by dimension. "Support and Empowerment" obtained the highest average (3.80), followed by "Impact on Academic Performance and Professional Development" (3.79), with "Quality and Adequacy of the Mentoring Process" trailing slightly (3.71).

Average value of female students' perception of gender-focused mentoring and how it influences academic performance, according to dimensions.

Dimension	Coding	Average Value
Perception of Support and Empowerment	DIMENSION 1	3.80
Quality and Adequacy of the Mentoring Process	DIMENSION 2	3.71
Perceived Impact on Academic Performance and Professional Development	DIMENSION 3	3.79

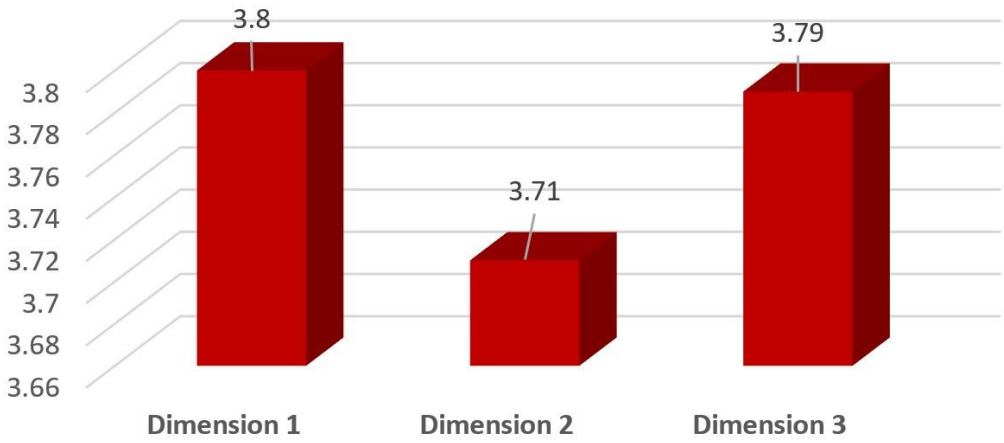

Figure 3.
Average perception of female students regarding gender-focused mentoring and how it influences academic performance by dimension.

Interpretation:
The highest values are:
DIMENSION 1: 3.80

It means that the perception of support and empowerment during mentoring has almost always helped improve academic performance.

DIMENSION 3: 3.79

It means that the Perceived Impact on Academic Performance and Professional Development is due to mentoring.

The lowest value is;

DIMENSION 2: 3.71

It means that the quality and adequacy of the mentoring process almost always influence academic performance.

4. Discussion

Findings reveal that gender-sensitive mentoring is perceived positively by participants, with the highest-rated items highlighting the safe space created for female students and the applicability of knowledge. This resonates with Bandura [5] theory that confidence and environment significantly shape academic performance.

Mentoring improved students' self-efficacy and resilience, mirroring outcomes in international studies Dennehy and Dasgupta [6] and Crisp and Cruz [7]. However, limited session frequency and availability suggest implementation barriers, a common challenge noted in similar Latin American contexts [12].

The dimension focusing on emotional and academic support revealed its importance in navigating gender-specific obstacles. These results reinforce calls for structured, inclusive, and continuous mentoring in technical education.

Moreover, students indicated that mentoring positively influenced their academic grades, organizational skills, and ability to apply technical knowledge in practice. This aligns with findings by Valverde [9] and Flores and Mena [8] emphasizing mentoring's potential in reducing dropout rates and improving performance.

Despite high satisfaction, operational weaknesses persist, particularly in mentor availability and time constraints. This highlights the need for institutional investment in resources, mentor training, and logistical planning.

According to the results obtained, it is demonstrated that female students positively perceive the emotional and academic support provided through the gender-focused mentoring program. The items with the highest scores (4.07 and 3.96) reflect that students value safe spaces to express their personal and professional concerns, as well as the opportunity to apply theoretical knowledge in professional practices. Recent research supports these results, linking mentoring with greater self-efficacy in technical environments [13].

However, the support and empowerment dimension obtained the highest average (3.80), confirming that participants believe mentoring strengthens their self-confidence, motivation, and sense of belonging in their technical careers. This perception coincides with Bandura [5] approach to academic self-efficacy as a driver of achievement and with studies that show improvements in women's participation and performance when personalized mentoring strategies are implemented [6, 8]. Therefore, gender-focused mentoring applied to female students represents an increase in the development of personal empowerment capacities; recent research confirms that mentoring with a gender perspective contributes not only to academic success but also to overall well-being.

At the same time, psychological empowerment is associated with improvements in academic participation, similar to findings at Peruvian universities, where mentoring programs increased women's confidence. However, limitations were noted in the logistics of mentoring. The lowest-scoring item (3.44) indicates dissatisfaction with the time allocated to resolve questions, a recurring problem in mentoring programs in technical education [13].

Regarding the impact on the academic performance dimension (3.79), the program's effectiveness stands out beyond the emotional component, as students, in my experience, report significant improvements in their academic performance and in the acquisition of technical skills, which reinforces the usefulness of this type of intervention as a tool for

educational equity [9, 12]. However, this dimension slightly exceeds the quality of the process (3.71), which shows us that, despite logistical limitations in its implementation, students perceive concrete benefits in their performance.

The study also yields results that identify structural limitations in the program's implementation. For example, the item with the lowest score (3.44) demonstrates a worrying dissatisfaction with the time available to mentors or the program itself to address questions during mentoring sessions. According to recent research, this situation has also been identified as a major weakness common in similar programs, especially in technical higher education institutions with limited human resources [12].

A quick analysis of the indicators shows that the results suggest opportunities for improvement. The frequency of meetings (3.56) was the lowest category, indicating that the effectiveness of mentoring could be increased through a greater number of sessions, better time planning, and improved availability and distribution of mentor time to the students. This suggests the need to strengthen the institutional management of the program and consider ongoing training for the staff involved.

In summary, the results obtained support the importance of gender-focused mentoring as a strategic tool for reducing gaps in technical contexts and promoting women's academic empowerment. However, its sustainability and effectiveness depend on operational adjustments, as well as institutional policies that guarantee its continuity and expansion. Furthermore, the need to promote longitudinal research that evaluates the sustained impact of mentoring on academic performance, student retention, and women's labor market integration in traditionally male-dominated technical sectors is reaffirmed.

5. Conclusions

This study confirms that gender-sensitive mentoring significantly supports female students in technical education. It enhances emotional resilience, academic confidence, and performance, helping women confront gender biases in traditionally male sectors.

To strengthen program effectiveness, institutions should:

a) Increase session frequency and allocate sufficient mentor availability.
b) Provide mentor training on gender equity and psycho-pedagogical strategies.
c) Expand mentoring programs to other technical fields.
d) Establish evaluation frameworks to monitor impact over time.

Future research should adopt longitudinal designs to assess the sustained effects of mentoring on academic persistence and professional insertion in male-dominated industries.

The results indicate that gender-focused mentoring is perceived as an effective academic and emotional support strategy within technical-vocational education. Participants reported increased motivation, self-confidence, and confidence to face technical challenges and continue their studies in traditionally male-dominated careers such as construction and sanitation.

A significant weakness is also observed in the operational aspect, given that the learning sessions proved to be insufficient, as well as the time allocated for personalized attention. If not addressed seriously, this would seriously compromise the program's true expected impact. Proper restructuring of program implementation planning can help achieve better and more consistent session delivery and effective use of time; mentors should be trained in gender strategies, emotional support, and active methodologies; and continuous monitoring and evaluation systems should be implemented for the program.

It is important to expand the program's coverage to include other careers and technical training levels so that participants have greater motivation, self-confidence, and confidence to face technical challenges, helping to increase their participation in society with independence, security, and social satisfaction.

In addition, longitudinal research on the sustained impact of gender-focused mentoring should be promoted.

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