

Work in Progress: Empowering Women in STEM through Mentoring and Community

Dr. Monica Quezada-Espinoza, Universidad Andres Bello, Santiago, Chile

Monica Quezada-Espinoza is a professor and researcher at the School of Engineering at Universidad Andrés Bello in Santiago, Chile, where she collaborates with the Educational and Academic Innovation Unit (UNIDA) as an instructor in active learning methodologies and mentors engineering faculty in educational research. She is the Secretary of the Women in Engineering Division (WIED) of the American Society for Engineering Education (ASEE) and an associate researcher in the STEM Latin America Network, specifically in the STEM + Gender group. Her research interests are diverse and focus on university education in STEM fields, faculty and professional development, research-based methodologies, and the use of evaluation tools and technology for education. She is also passionate about investigating conceptual learning in abstract physics topics, developing strategies to improve the retention of first-year engineering students, and enhancing skills and competencies in higher education. Additionally, Monica is dedicated to exploring gender issues in STEM education, with a particular emphasis on studying and proposing improvements for the inclusion of women in highly male-dominated fields. For more information on her work, visit her ORCID profile.

Prof. Maria Elena Truyol, Universidad Andres Bello

María Elena Truyol, Ph.D., is full professor and researcher of the Universidad Andrés Bello (UNAB). She graduated as a physics teacher (for middle and high school), physics (M.Sc.), and a Ph.D. in Physics at Universidad Nacional de Córdoba, Argentina. In 2013, she obtained a three-year postdoctoral position at the Universidade de Sao Paulo, Brazil. She focuses on educational research, physics education, problem solving, instructional material design, teacher training, and gender studies. She teaches undergraduate courses in environmental management, energy, and the fundamentals of industrial processes at the School of Engineering, UNAB. She currently coordinates the Educational and Academic Innovation Unit at the School of Engineering (UNAB). She is engaged in continuing teacher training in active learning methodologies at the three campuses of the School of Engineering (Concepción, Viña del Mar, and Santiago, Chile). She authored several manuscripts in the science education area, joined several research projects, participated in international conferences with oral presentations and keynote lectures, and served as a referee for journals, funding institutions, and associations.

Prof. Genaro Zavala, Tecnológico de Monterrey, Monterrey, Mexico; Universidad Andres Bello, Santiago, Chile

Genaro Zavala is the leader of the Socially Oriented Interdisciplinary STEM Education Research Group of the Institute for the Future of Education at Tecnológico de Monterrey. He collaborates with the Faculty of Engineering, Universidad Andres Bello in Chile. He is National Researcher Level 2 in Mexico. His research lines are interdisciplinary STEM education, social oriented education, conceptual understanding, active learning, assessment tools, and faculty development. Dr. Zavala was appointed to the editorial board of the PRPER (2015-18). In the AAPT, he was a vice-presidential candidate, member of the Committee on Research in Physics Education, member and chair of the International Education Committee, and elected member of Leadership Organizing Physics Education Research Council.

Prof. Angeles Dominguez, Universidad Andres Bello, Chile; Tecnológico de Monterrey, Mexico

Angeles Dominguez is an adjunct researcher at the Institute for the Future of Education at Tecnológico de Monterrey, Mexico. She also collaborates with the School of Engineering at the Universidad Andres Bello in Santiago, Chile. Angeles holds a bachelor's degree in Physics Engineering from Tecnológico de Monterrey and a doctoral degree in Mathematics Education from Syracuse University, NY. Dr. Dominguez is a member of the Researchers' National System in Mexico (SNI-2) and has been a visiting researcher at Syracuse University, UT-Austin, and Universidad Andres Bello. Her main research areas are interdisciplinary education, teaching methods, faculty development, and gender issues in STEM education. She actively participates in several national and international mathematics, engineering, and science education projects.

Work in Progress: Empowering Women in STEM through Mentoring and Community

Abstract

Persistent gender disparities in STEM emphasize the importance of institutional strategies that intentionally support women's academic and professional growth. This Work in Progress paper introduces WSTEM-Comunidad, an ongoing initiative at a Latin American university that empowers women university teachers and doctoral students in STEM through a structured mentoring program and the development of a supportive academic community. The main goal is to enhance participants' leadership, communication, and self-management skills while fostering self-efficacy, sense of belonging, professional identity, and academic confidence. WSTEM-Comunidad combines personalized mentoring, leadership development, and intergenerational networking among faculty members and doctoral students. The model is carried out in four progressive stages: (1) leadership and self-development workshops; (2) one-on-one mentoring among women faculty members; (3) advanced training and community-building activities; and (4) intergenerational mentoring that involves doctoral students. A longitudinal mixed-methods with a cyclic sequential research design (QUAN-qual) will assess the program's results through pre- and post-intervention surveys and focus groups, measuring changes in self-efficacy, professional identity, and sense of belonging. The anticipated outcomes include establishing a sustainable network of women in STEM, improving participants' confidence and leadership abilities, and increasing institutional awareness of gender equity as strategic priority. This practice-based research paper presents WSTEM-Comunidad as an innovative, contextually relevant approach that combines mentoring, training, and community-building to promote equity at a Latin American private university. It also explains how this framework can be adapted and replicated in other institutions seeking to improve the retention, advancement, and well-being of women in academia. The study adds to the ongoing conversation on gender equity in STEM by offering a framework for how mentoring and community-building initiatives can serve as transformative mechanisms for institutional change.

Keywords: Mentoring, Gender Equity, Women in STEM, Leadership Development, Higher Education, Community building, Latin America

Introduction

This article presents WSTEM-Comunidad, an ongoing initiative implemented at a Latin American university that empowers women, university teachers and doctoral students, in STEM field, through a structured mentoring program and the creation of a supportive academic community. The rationale, design, anticipated results, and expected impact of the initiative (recently launched) are shared below with the aim of receiving feedback from the WIED community to help us improve the implementation.

The design of STEM (Science, Technology, Engineering, and Mathematics) mentoring programs responds to the urgent need to close gender gaps and increase women's representation and

participation in these fields. Currently, only one-third of the world's scientists are women, who face structural, cultural, and social barriers that limit their development and leadership in science [1], [2], [3]. In this context, mentoring emerges as a key strategy to mitigate these inequalities, providing psychosocial support, professional development opportunities, and role models that foster self-efficacy, persistence, and professional identity in STEM [4], [5], [6].

Mentoring is defined as a relationship in which a more experienced person guides and supports a less experienced person in their academic and professional career [5], [7], [8]. Both formal and informal programs have demonstrated significant benefits, including strengthening self-efficacy, developing professional identity, and improving academic and work outcomes, especially for women [4], [9], [10]. For doctoral students, mentoring not only fosters research skills but also resilience in the face of the challenges inherent to academia [10], [11]. Gender-focused mentoring models highlight the importance of mentors as role models, who have a positive impact on the confidence and perception of achievement of women doctoral students [5], [12], [13].

Gender inequality is also evident in immediate employment outcomes after graduation, where women face greater difficulties in accessing jobs commensurate with their training and tend to receive lower salaries than their men peers with equivalent academic credentials [10], [14], [15]. In Chile, recent data [16] show that women's participation in engineering has remained between 20% and 24% over the last decade, reflecting the persistence of cultural and social barriers. This situation underscores the importance of sustained interventions, such as mentoring, that begin early on and continue throughout the academic career.

According to previous studies, mentoring programs have a transformative impact on three main levels:

1. Psychosocial and Professional Level
 - Increased self-efficacy, motivation, and persistence among participants [4], [7], [17].
 - Reduction in the perception of threats based on gender stereotypes [4], [10], [12].
2. Organizational and Cultural Level
 - Improved gender equity and strengthened interdisciplinary support networks [1], [18], [19].
 - Visibility of role models who inspire future generations [5], [9], [12].
3. Systemic Level
 - Contribution to the Sustainable Development Goals (SDGs), specifically #5 on Gender Equality, by promoting structural changes in academic and scientific institutions [1], [2].

The conceptual framework of the WSTEM-Comunidad initiative is grounded in empirical evidence demonstrating the transformative effects of STEM mentoring programs. The initiative seeks to enhance the professional identity and leadership of university teachers, researchers, and doctoral students through an intergenerational support community. This structure promotes the transfer of knowledge and experience, ensuring the program's sustainability via strategies such as one-on-one mentoring, training, and community-building activities. Consequently, the WSTEM-

Comunidad initiative has the potential to empower participants as agents of change within their fields and institutional settings.

The following are the general and specific research questions, along with the corresponding objectives.

General research question of the WSTEM-Comunidad initiative

- What is the impact of a mentoring and training program on the self-efficacy, professional identity, sense of belonging, and professional development of women in academia (university teachers, researchers, and doctoral students) in STEM fields at Universidad Andres Bello?

Specific research questions of the WSTEM-Comunidad initiative

- How does training in leadership, communication, and self-management skills contribute to the professional and personal development of women (university teachers and researchers) in STEM fields?
- How does one-on-one mentoring impact the self-efficacy, sense of belonging, and professional development of women (university teachers, researchers, and doctoral students) in STEM fields?
- What benefits and challenges do participants perceive when they are part of an intergenerational support community of women in STEM?
- How does the STEM support and collaboration network influence participants' self-efficacy, professional identity, and sense of belonging?

General Objective of WSTEM-Comunidad

To analyze the impact of a mentoring program for women in academia—including university teachers, researchers, and doctoral students—in STEM fields at the participating university on enhancing leadership, communication, and self-management skills, as well as fostering professional growth, identity in STEM, and a sense of belonging in the academic community.

Specific Objectives of WSTEM-Comunidad

1. To provide initial and advanced training in leadership and self-management skills for women in STEM fields.
2. To foster the professional and personal development of women academician (university teachers and researchers) through personalized one-on-one mentoring.
3. To create and consolidate a community of women academician (university teachers and researchers) in STEM at University Andres Bello that facilitates mutual support and interdisciplinary collaboration.
4. To expand the program to include doctoral students in STEM and strengthen their personal and professional development through mentoring.
5. To evaluate, among participants, the program's impact on self-efficacy, professional identity, and sense of belonging to the institution in STEM fields.

WSTEM-Comunidad Methodology

This study employs a cyclic sequential research design (QUAN-qual), resulting in a case study at Universidad Andres Bello. The WSTEM-Comunidad program employs a progressive structure that combines personalized mentoring, training, and support network building to foster the development of professional skills and reduce gender gaps in STEM. It will be developed in four phases, implemented over four consecutive semesters. The first three semesters will focus on university teachers and researchers, and in the fourth semester, the program will be extended to women doctoral students in a STEM graduate program.

WSTEM-Comunidad Program Design

The program design consists of four phases, each with an estimated duration of one semester, to accommodate the institution's academic calendar. The activities of each phase are described in detail below, and a diagram summarizing the main actions of each phase is presented (Figure 1). The program will start in March 2026.

Phase 1: Initial Training (1st Semester)

1. Online courses (MOOCs) on mentoring principles, unconscious stereotypes and biases, leadership skills, and mentoring plan design. These courses were previously designed and implemented within an international mentoring initiative supported by the British Council and have been adapted to the institutional context of the University Andres Bello. Call for mentors and mentees (Group 1). Courses will be open for all faculty members. To become a mentor or mentee, the courses are mandatory.
2. In-person workshops and webinars with experts in professional development. Women faculty members in STEM fields will be encouraged to participate, and training will conclude with a social gathering, as this is an essential part of building a community.

Evaluation: First collection of quantitative data on self-efficacy, professional identity, and sense of belonging. The instrument was adapted from [20].

Phase 2: One-on-One Mentoring (2nd Semester)

1. Matching mentors and mentees according to their areas of interest and professional goals. To this end, the registration data collected includes questions that allow for the identification of elements of compatibility, such as topics of interest and hobbies.
2. At least 12 mandatory mentoring sessions per semester (1-hr long), with follow-up and recording of SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) goals [21], [22], [23]. Interviews or focus groups to learn about participants' perspectives on their development. At the end of the semester, an evaluation of the program will be conducted to monitor progress and adjust the methodology, if necessary.

Evaluation: Second collection of quantitative data and first collection of qualitative data through interviews or focus groups.

Phase 3: Advanced Training and Community Building (3rd Semester)

1. Advanced training for mentors (Group 1) in mentoring skills, conflict resolution, and effective communication. These courses have previously been implemented at Universidad Andres Bello (Preparing You as a Mentor), an initiative funded by the Science and Innovation 2030 project and carried out by the Committee for Gender

Equity and Leadership in Science. Call for mentors and mentees (Group 2). In this call, mentees will be doctoral students and junior faculty members, all women.

2. Group meetings and social gatherings to strengthen the community and generate support networks.

Evaluation: Third collection of quantitative data to measure progress in leadership, sense of belonging, and self-efficacy.

Phase 4: One-on-One Mentoring with Doctoral Students (4th Semester).

1. Selection and training of junior faculty members and doctoral students as mentees. Pairing using the same methodology as before (Phase 2, point 1).
2. One-on-one intergenerational mentoring between women university teachers and researchers (trained as mentors in Phases 1-3) and doctoral students focused on professional and personal development. Twelve one-hour sessions per pair.
3. Group sessions and social gatherings to strengthen the community.

Evaluation: Fourth collection of quantitative data, including doctoral students [20], and a second collection of qualitative data through interviews or focus groups.

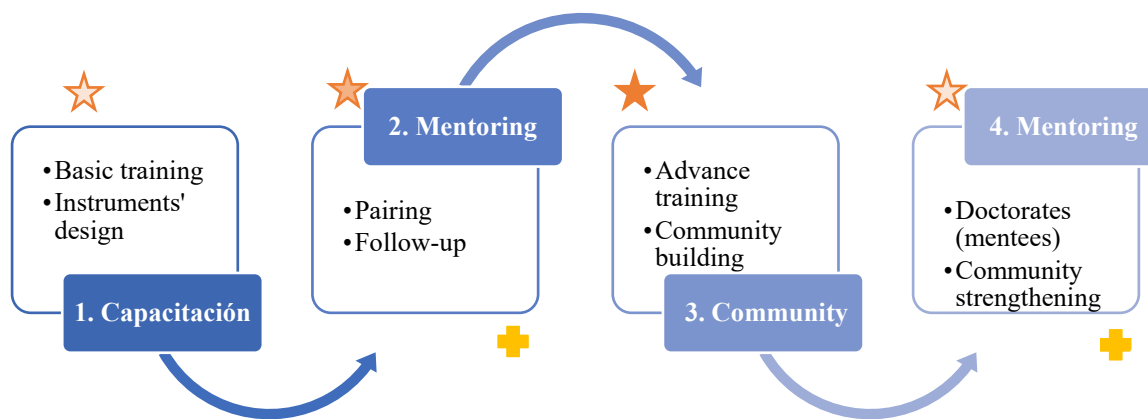


Figure 1. The four phases of the WSTEM-Comunidad program, the participants involved in each phase (women faculty in Phases 1–3; doctoral students added in Phase 4), and the moments of quantitative (stars) and qualitative (crosses) data collection

Participants

The selection of participants (mentors and *mentees*) will be carried out as follows:

- **University teachers and researchers:** A call for applications will be opened for teachers and researchers in STEM areas with permanent contracts at Universidad Andres Bello. Those selected must commit to completing the training and mentoring sessions. Participation will be voluntary, and the program will seek the participation of STEM schools (Engineering, Exact Sciences, and Life Sciences). The expected number of participants is 60 women, a target defined based on the institution's STEM women faculty population and on the program's mentoring capacity. In addition, international professors who teach in our postgraduate programs will be invited to participate in order to contribute to the Internationality initiative. These international professors will form part of the community and provide mentoring to our doctoral students but are not counted among the 60 faculty participants.
- **Doctoral students:** In the fourth semester of the program, junior women faculty members and women doctoral students in a STEM graduate program at Universidad Andres Bello

will be invited to participate as *mentees* in the program. The call for applications will be open, and participation will be voluntary, with a commitment to complete the training (for *mentees*) and attend all mentoring sessions. The expected number of mentees is 60 women. The mentors of these doctoral students will be drawn from the women faculty trained as mentors in Phases 1–3, complemented by the international professors mentioned above.

Data collection and analysis

- **Quantitative data:** Surveys will be administered in two consecutive cycles at three key moments (at the beginning of the program, after training, and at the end of mentoring) to measure changes in professional identity, sense of belonging, self-efficacy, and skill development. The cycle starts at the beginning of Phase 1 and Phase 3. For the statistical analysis JASP will be used.
- **Qualitative data:** Two rounds of focus groups and semi-structured interviews will be carried out, at the end of Phase 2 and at the end of Phase 4, to gather participants' experiences and perceptions. Qualitative analysis software (Atlas.ti) will be used to identify patterns and recurring themes in participants' testimonies, facilitating triangulation with quantitative results. Thematic clustering of coded responses will be applied to obtain a complementary perspective on the qualitative data.
- **Ethics committee:** For this study, the ethics committee of the institution has approved the methods for data collection, use, and confidentiality mechanisms. All participants will be asked to sign an informed consent form containing all necessary information about the study, the anonymity and confidentiality of the data, and contact details for any questions regarding the project's ethics committee approval.

Expected Results of WSTEM-Comunidad

At the end of the WSTEM-Comunidad initiative, the following key results are expected to have been achieved:

2. **Creation of a STEM Community**
 - A consolidated community of women in STEM, comprising at least three schools (Engineering, Exact Sciences, and Life Sciences), which will include university teachers, researchers, and doctoral students.
3. **Understanding Needs and Barriers**
 - Qualitative and quantitative information that delves into the needs and barriers, as well as benefits and advantages of the professional development of women academician (university teachers and researchers) in STEM, which will allow for the design of more effective and context-specific interventions.
4. **Academic Outputs**
 - Presentation of results at two international conferences relevant to gender equity and STEM.
 - Publication of an article in a Q1/Q2 indexed journal, consolidating evidence on the effectiveness of the mentoring program and the impact of the support network (community).
5. **Tools for Program Sustainability**

- Courses designed, implemented, and adjusted for mentors and *mentees*, adapted to the culture and context of Universidad Andres Bello.
- Development of a practical guide on program implementation (training, mentoring, community building), including best practices and strategies to ensure sustainability and replicability of the model across institutions and countries.
- The team project is collaborating with the Academic Vice Rector's office to transform this model into an established mentoring program offered by the institution. Additionally, proposals to continue this program will be submitted to national or international funding.

Limitations and Considerations

As a Work-in-Progress, several limitations are acknowledged. First, participation in the program is voluntary, which introduces a self-selection bias: women who choose to enroll may already be more motivated to engage in professional development and community-building activities than the average STEM faculty member. Second, the study is an institutional case study at a single Latin American private university, which limits the statistical generalizability of its findings; transferability, however, is supported through detailed documentation of context-dependent adaptations. Third, the program has no comparison or control group, so observed pre-post changes cannot be unambiguously attributed to the intervention; triangulation with qualitative data is intended to mitigate this limitation. Finally, the research team is part of the academic community being studied, which raises positionality considerations; reflexivity strategies and external review of qualitative coding will be used to address this risk.

Conclusions

The WSTEM-Comunidad initiative is expected to be a transformative initiative at Universidad Andres Bello. At the end of the two years of implementation, the overall impact of the WSTEM-Comunidad program is expected to be significant and lasting:

For the participating university teachers and researchers:

- Improvement of professional and leadership skills.
- Strengthening of their identity in STEM and creation of sustainable support networks that promote their ongoing professional development.
- Reduction of gender barriers in academia, improving their integration and visibility in that environment.

For doctoral students:

- Access to guided intergenerational mentoring that will support them in their first steps in academia, increasing their confidence and skills for future careers in STEM.
- Strengthening of their professional identity and sense of belonging in a traditionally male-dominated field.

For the academic community:

- Creation of a more inclusive and equitable academic culture by consolidating a community of women in STEM as a benchmark within Universidad Andres Bello.
- Direct contribution to the fulfillment of Sustainable Development Goal 5: Gender Equality [2], and the UNESCO Call to Action [1] setting a precedent in the implementation of effective practices to reduce gender disparities in STEM.

In addition, WSTEM-Comunidad is designed with transferability and replicability in mind. By documenting core program components, context-dependent adaptations, and shared implementation and outcome indicators (included in the practical guide described under Project Deliverables), the initiative aims to support evidence-informed replication across institutions within Chile and in other national contexts.

Prior to the formal launch of WSTEM-Comunidad, the online course to be used in Phase 1 was evaluated as part of an undergraduate thesis, which has already been defended; the results of that evaluation have been submitted for presentation at WIED and informing the current design of the program. As the initiative unfolds, two additional undergraduate theses are envisioned, conducted with members of the WSTEM-Comunidad research team, on the following topics:

- A study on the effect of mentoring on women in STEM fields, measured by self-efficacy, sense of belonging, and identification with STEM, among other factors.
- A study on the impact of creating a community of women in STEM, identifying barriers and facilitators, advantages and disadvantages, best practices, and the sustainability of such a community

In short, this manuscript presents an ongoing mentoring initiative that contributes to the current dialogue on gender equality in STEM fields [15] in Latin American countries. This effort satisfies the dissemination of the initiative and is expected to be enriched by the WIED community. The study adds to the ongoing conversation on gender equity in STEM by offering a framework for how mentoring and community-building initiatives can serve as transformative mechanisms for institutional change in Latin America.

Acknowledgments

This work was supported by the Gender Research Project DI-01-25/PG entitled “*Liderazgo y Comunidad: Evaluación de un Programa de Mentoría para Mujeres Académicas en STEM (WSTEM-Comunidad)*” at Universidad Andres Bello, Chile. The authors also acknowledge the leadership and financial support of the School of Engineering, as well as the Educational Research and Academic Development Unit (UNIDA) for its mentorship and guidance in strengthening research capabilities in higher education.

Lastly, the authors are grateful to the British Council for their continuous support in bridging the gender gap in STEM in Latin America through their mentoring programs and networks.

References

- [1] UNESCO, “Call to Action: Closing the Gender Gap in Science,” Paris, Programme and meeting document SC-PBS-STIP/2024/FWIS/1 Rev.2, 2024. [Online]. Available: <https://unesdoc.unesco.org/ark:/48223/pf0000388641.page=4>
- [2] UN Women and DESA, “Progress on the Sustainable Development Goals: The Gender Snapshot 2025,” UN Women and United Nations Department of Economic and Social Affairs, Statistics Division, New York, 2025. Accessed: Feb. 22, 2026. [Online]. Available: <https://www.unwomen.org/en/resources/gender-snapshot>.
- [3] A. Dominguez, “Liderazgo institucional para incrementar la participación de la mujer en áreas STEM: El caso del Tecnológico de Monterrey,” in *Mujeres en la educación universitaria de ciencia, ingeniería, tecnología y matemáticas: Atracción, acceso y acompañamiento para reducir la brecha de género en Hispanoamérica*, in Universidad. , Barcelona, España, 2023, pp. 371–386. [Online]. Available: <https://octaedro.com/wp-content/uploads/2023/05/9788419690104.pdf>
- [4] E. Wolf and S. Brenning, “Unlocking the Power of Mentoring: A Comprehensive Guide to Evaluating the Impact of STEM Mentorship Programs for Women,” *Social Sciences*, vol. 12, no. 9, p. 508, Sep. 2023, doi: 10.3390/socsci12090508.
- [5] S. Moghe, K. Baumgart, J. J. Shaffer, and K. A. Carlson, “Female mentors positively contribute to undergraduate STEM research experiences,” *PLoS ONE*, vol. 16, no. 12, p. e0260646, Dec. 2021, doi: 10.1371/journal.pone.0260646.
- [6] E. García-Silva, S. Perez-Suarez, A. Zavala-Parrales, F. E. Meléndez-Anzures, and A. Dominguez, “Continuing education of academic women in STEM: perspectives on mentoring and professional roles,” *Front. Educ.*, vol. 10, p. 1473331, Feb. 2025, doi: 10.3389/educ.2025.1473331.
- [7] P. R. Hernandez *et al.*, “Promoting professional identity, motivation, and persistence: Benefits of an informal mentoring program for female undergraduate students,” *PLoS ONE*, vol. 12, no. 11, p. e0187531, Nov. 2017, doi: 10.1371/journal.pone.0187531.
- [8] S. Perez-Suarez, E. García-Silva, A. Zavala-Parrales, A. V. Martinez, A. García-Holgado, and A. Dominguez, “Analysis of Perspectives and Experiences of Women in STEM Fields in a Mentoring Program,” in *2024 IEEE Global Engineering Education Conference (EDUCON)*, Kos Island, Greece: IEEE, May 2024, pp. 1–5. doi: 10.1109/EDUCON60312.2024.10578696.
- [9] S. Torres-Ramos *et al.*, “Mentors as Female Role Models in STEM Disciplines and Their Benefits,” *Sustainability*, vol. 13, no. 23, p. 12938, Nov. 2021, doi: 10.3390/su132312938.
- [10] J. A. Amador-Campos *et al.*, “Mentoring and Research Self-Efficacy of Doctoral Students: A Psychometric Approach,” *Education Sciences*, vol. 13, no. 4, p. 358, Mar. 2023, doi: 10.3390/educsci13040358.
- [11] N. Curtin, J. Malley, and A. J. Stewart, “Mentoring the Next Generation of Faculty: Supporting Academic Career Aspirations Among Doctoral Students,” *Res High Educ*, vol. 57, no. 6, pp. 714–738, Sep. 2016, doi: 10.1007/s11162-015-9403-x.
- [12] Ma. C. Saffie-Robertson, “It’s Not You, It’s Me: An Exploration of Mentoring Experiences for Women in STEM,” *Sex Roles*, vol. 83, no. 9–10, pp. 566–579, Nov. 2020, doi: 10.1007/s11199-020-01129-x.
- [13] F. E. Melendez-Anzures, A. Dominguez, S. Perez-Suarez, and A. Zavala-Parrales, “Strengthening STEM Mentorship for Women: Challenges, Best Practices, and Participant Insights,” in *2025 IEEE Engineering Education World Conference (EDUNINE)*,

- Montevideo, Uruguay: IEEE, Mar. 2025, pp. 1–6. doi: 10.1109/EDUNINE62377.2025.10981393.
- [14] K. Jasko, J. Pyrkosz-Pacyna, G. Czarnek, K. Dukała, and M. Szastok, “The STEM Graduate: Immediately after Graduation, Men and Women Already Differ in Job Outcomes, Attributions for Success, and Desired Job Characteristics,” *Journal of Social Issues*, vol. 76, no. 3, pp. 512–542, Sep. 2020, doi: 10.1111/josi.12392.
 - [15] S. Verdugo-Castro *et al.*, “Identificación de barreras y motivaciones percibidas por mujeres estudiantes de ingeniería y matemáticas: Estudio de caso en España y Latinoamérica,” in *Estudios Interdisciplinarios de Género*, Thomson Reuters Aranzadi, 2021, p. Chapter 49, 813–828. Accessed: Feb. 22, 2026. [Online]. Available: <https://dialnet.unirioja.es/servlet/articulo?codigo=8199580>
 - [16] C. A. Jiménez, E. A. Jones, and C. L. Vidal, “Estudio Exploratorio de Factores que Influyen en la Decisión de la Mujer para Estudiar Ingeniería en Chile,” *Inf. tecnol.*, vol. 30, no. 4, pp. 209–216, Aug. 2019, doi: 10.4067/S0718-07642019000400209.
 - [17] A. E. Dawson, B. L. Bernstein, and J. M. Bekki, “Providing the Psychosocial Benefits of Mentoring to Women in STEM: Career WISE as an Online Solution,” *New Drctns Hghr Edu*, vol. 2015, no. 171, pp. 53–62, Sep. 2015, doi: 10.1002/he.20142.
 - [18] V. Washington and J. Mondisa, “A need for engagement opportunities and personal connections: Understanding the social community outcomes of engineering undergraduates in a mentoring program,” *J of Engineering Edu*, vol. 110, no. 4, pp. 902–924, Oct. 2021, doi: 10.1002/jee.20422.
 - [19] W. Hall, T. Schmader, E. N. Cyr, and H. B. Bergsieker, “Collectively constructing gender-inclusive work cultures in STEM,” *European Review of Social Psychology*, vol. 34, no. 2, pp. 298–345, Jul. 2023, doi: 10.1080/10463283.2022.2109294.
 - [20] D. Findley-Van Nostrand and R. S. Pollenz, “Evaluating Psychosocial Mechanisms Underlying STEM Persistence in Undergraduates: Evidence of Impact from a Six-Day Pre-College Engagement STEM Academy Program,” *LSE*, vol. 16, no. 2, p. ar36, Jun. 2017, doi: 10.1187/cbe.16-10-0294.
 - [21] G. T. Doran, “There’s a S.M.A.R.T. way to write managements’s goals and objectives,” *Management Review*, vol. 70, no. 11, pp. 35–36, 1981.
 - [22] A. Suleman, P. Chigeza, and J. Mensinga, “Development of a Peer-Teaching Mentoring Programme Using SMART Goals,” *Prism: Casting New Light on Learning, Theory & Practice*, vol. 7, no. 1, pp. 59–72, 2025.
 - [23] C. J. Pacheco Figueroa and M. A. Alvarez Lemus, “Mentoring women in STEM: empowering through social technologies for enhanced inclusivity and professional growth. A case study,” *Front. Educ.*, vol. 10, p. 1512143, Feb. 2025, doi: 10.3389/feduc.2025.1512143.