

# **Evaluating the Impact of Mentoring on the Development of Soft and Technological Skills of Women in the Textile Sector in High Andean Regions**

## **Evaluando el Impacto de Mentorías en el Desarrollo de Habilidades Blandas y Tecnológicas de Mujeres en el Sector Textil en Regiones Alto Andinas.**

Klinge Orlando Villalba-Condori  
Universidad Católica de Santa María. Arequipa, Peru  
kvillalba@ucsm.edu.pe

Huizilopoztli Luna-García  
Universidad Autónoma de Zacatecas. Zacatecas, México  
hlugar@uaz.edu.mx

Carlos H. Epino-Salinas  
Universidad Autónoma de Zacatecas. Zacatecas, México  
carlospino@uaz.edu.mx

### **Abstract**

This study focuses on evaluating the influence of mentoring on technological tools and the strengthening of soft skills among women operators in the textile sector in southern Peru. Two case studies were conducted to measure this impact, carried out on different groups before and after mentoring on soft skills and technological tools, respectively, focusing on acquiring or developing soft skills and basic technological skills such as Google search usage, Canva, and social media management. The results indicate that mentoring has influenced the development of technological skills among the participants. However, there was no statistical inference in the soft skills evaluated by internal consistency using the Alpha coefficient ( $\alpha = 0.70$ ), except for the Flexibility dimension, which showed statistically significant differences and positively affected pre-test and post-test measures. Pre-mentoring surveys revealed a widespread lack of technological skills, with limited knowledge of the use of tools such as search engines and graphic design platforms, and post-mentoring surveys showed improvements in these areas. This study highlights the importance of mentoring in developing soft and basic technological skills and empowering women in the textile sector in the high Andean regions.

**Key words:** Mentoring, Soft Skills, Technological Skills.

### **Resumen**

Este estudio se enfoca en evaluar la influencia de mentorías en el uso de herramientas tecnológicas y el fortalecimiento de habilidades blandas en mujeres operadoras del sector textil en el sur de Perú. Se realizaron dos estudios de caso para medir este impacto, llevados a cabo en grupos diferentes antes y después de una mentoría sobre habilidades blandas y herramientas tecnológicas respectivamente, centrándose en la adquisición o desarrollo de habilidades blandas y habilidades tecnológicas básicas como el uso de búsqueda en Google, Canva y gestión de redes sociales. Los resultados indican que las mentorías han influido en el desarrollo de habilidades tecnológicas entre los participantes, pero no hubo inferencia estadística en las habilidades blandas evaluadas por consistencia interna utilizando el coeficiente Alfa ( $\alpha = 0.70$ ), con la excepción de la dimensión Flexibilidad, que mostró diferencias estadísticamente significativas, teniendo un efecto positivo en las medidas de pre-test y post-test. Las encuestas pre-mentoría revelaron una falta generalizada en la mayoría de las habilidades tecnológicas, con conocimientos limitados en el uso de

herramientas como motores de búsqueda y plataformas de diseño gráfico, y las encuestas post-mentoría mostraron mejoras en estas áreas. Este estudio resalta la importancia de la mentoría en el desarrollo de habilidades blandas y tecnológicas básicas, empoderando a mujeres en el sector textil en las regiones alto andinas.

**Palabras clave:** Mentoría, Habilidades blandas, Habilidades tecnológicas.

## 1. Introduction

Peru is one of the countries with the world's highest concentration of domestic camelids, such as alpacas, llamas, and vicuñas located in the high Andean zones (3800 to 4700 m.a.s.l.), where fibre production and activities derived from them in the textile sector are of great importance. According to ComexPerú, Peru is the leading producer of camelid fibre textile products at the large, medium, small, and microenterprise levels, which in many cases are identified by associations led by women of different ages. The National Institute of Statistics and Informatics (INEI) reported that in the first quarter of 2020, a total of 20,697 companies were led by women (53.7%); within this, it is considered that 22.5% correspond to women who report higher rates of entrepreneurship in micro and small enterprises than men (21.9%), according to this the Fintech brings together startups dedicated to financial services based on new technologies where women lead 44% of these companies.

The labour market currently demands from people a profile that is not limited by theoretical knowledge acquired in the course of educational training but instead demonstrates or has skills related to the organizational and social field. About this, it can give way to hard and soft skills. Yamada et al. (2014) report that these skills allow workers to learn, motivate themselves, adapt and solve problems. However, talking about each of them individually, Espinoza and Gallegos (2020) state that hard skills refer to all curricular academic knowledge obtained in the formal training process- all skills learned. Soft skills can be seen from different perspectives; for example, Ortega et al. (2016) propose that soft skills are personal characteristics that allow a person to relate effectively and appropriately, focusing on the organizational field or another, such as daily life. Likewise, Zepeda et al. (2019) mention something similar, describing soft skills as characteristics of human beings that facilitate their interaction with others in the workplace or something else related to it.

Soft skills can also be conceptualized as personal skills that allow people to communicate effectively to face each demand in their daily lives (De la Cruz, 2020). Furthermore, Ortega (2017) indicates that these skills make people perform better in their work and personal relationships. For all of the above, Singer et al. (2009) mention that hard skills can be trained quickly, while soft skills can take years.

Paving the way for soft skills, De Luca (2019) states that there is no exact list of soft skills; conversely, they can be grouped according to an organization's or company's competencies. However, Matus and Gutierrez (2015) indicate that the competencies closest to soft skills are adaptability to change and autonomous learning since they are the most difficult to evaluate and develop since personality traits trigger them.

Tito and Serrano (2016) report that employers now assume that there is sufficient technical and intellectual preparation and focus on hiring people with soft skills since these are considered competitive advantages among companies. It is for the latter that organizations highly value soft skills since they are also linked to high performance and

are essential to achieving a company's objectives (Vera, 2016). In addition, Krawczyk-Sokolowska et al. (2019) mention that soft skills are vital to achieving organizational development and effectiveness. The market currently demands soft skills from people in the workplace since these have a close relationship with achievement and success. Therefore, developing soft skills is essential, but it is a challenging task. That said, this is where mentoring can come in; Smith et al. (2016) indicate that mentoring can be a good instrument because it can be applied in different ways, offering people an opportunity for change. For example, an improvement in emotional and cognitive skills, remarkable progress in terms of identity and enjoyment of well-being are the results that mentoring usually has (Rhodes et al., 2006).

Mentoring can be seen from various points of view. The National Mentoring Partnership (2005) states that mentoring is a method where mentors provide support, reflections, attachments, and examples. Constructive to those mentored so that they can later have sound potential. Mentoring is intended to support students in their academic and emotional well-being as they work toward their educational goals. Providing students with access to quality mentors is considered a responsibility of higher education institutions (Andersen & West, 2020). On the other hand, Sánchez et al. (2011) state that mentoring is an interactive activity between the mentor and the mentee to develop some competencies and the latter's ability to adapt. Finally, Bozeman and Feeney (2007) indicate that mentoring is a process of informal transfer of knowledge, social capital and psychosocial support, which are essential for professional development and work.

Entrepreneurship is traditionally associated with men globally. (Astorga, 2019) has experienced a notable increase in the participation of women, especially in Latin America, where both men and women have high rates of entrepreneurship (Segarra et al., 2020). This phenomenon is attributed, among other reasons, to the limited accessibility of job opportunities for women compared to men. In Peru, 63 % of women entrepreneurs have completed technical studies, 44 % take risks, 68 % are willing to learn from their mistakes, 65 % have other stable income, 82 % are willing to learn, 50 % consider that age is a relevant factor for entrepreneurship and that it is easier for young women to undertake entrepreneurship (Vasquez Lopez, 2018). In other Latin American countries, entrepreneurship arises out of necessity rather than opportunity, given the limited employment options for women in the conventional labour market (Estrada et al., 2020). (Estrada et al., 2020; Uzcategui Sánchez et al., 2017).

### **1.1. Impact on economic sectors during the COVID-19 pandemic**

According to the above, a scenario was experienced due to the COVID-19 pandemic, which has harmed various economic sectors; tourism and the textile sector were significantly affected due to restrictions on the export of products for large companies and limitations in small and micro enterprises. In this context, before the pandemic, 45 % of the enterprises were led by women; after the pandemic, this percentage increased to 68% for 38% of women entrepreneurs. Entrepreneurship is the primary source of income, while 22% is a temporary source, and 33% is an essential source of income. (Gabriel-Campos et al., 2021)

Due to the health, economic, and social crisis generated by the pandemic, the need to strengthen women's entrepreneurship was identified, focusing especially on the rural areas of the country. These areas provide significant potential among young women who are willing to start textile enterprises.

The COVID-19 pandemic has triggered a global crisis with profound impacts across various sectors, with tourism bearing a significant brunt (Gabriel-Campos et al., 2021;

Higgins-Desbiolles, 2020). This impact is crucial considering that tourism is a cornerstone of many economies, directly affecting the textile sector, especially in the high Andean regions. These regions heavily rely on income generated from tourists who patronize local products, including the distinctive handicrafts and textiles synonymous with each high Andean locale. The pandemic exacerbated economic challenges for artisans and small-scale textile entrepreneurs in these areas. Moreover, their dependence on the informal economy and limited access to financial resources further hindered sector resilience. In response to the crisis, the Peruvian government and other stakeholders have initiated efforts to revitalize the textile sector, adapting to the digital age by leveraging technological tools such as social media to showcase their offerings. Concurrently, with the ongoing evolution of technologies and methodologies aimed at democratizing education, distance education (EAD) has gained prominence as a prevalent, educational modality worldwide (Massuga et al., 2021). In this context, the significance of providing training and updates to affected populations through mentoring, both in-person and virtual, has become increasingly evident. These mentorship programs are considered crucial strategies to bolster the sector's adaptation to new technological dynamics and foster economic recovery.

## **1.2. Mentoring**

In order to grasp the essence of mentoring, it is essential to consider diverse perspectives. The National Mentoring Partnership (2005) defines mentoring as a method wherein mentors offer support, reflection, connection, and exemplary guidance to mentees, fostering their potential for future endeavours. Conversely, Sánchez et al. (2011) characterize mentoring as an interactive engagement between mentor and mentee to cultivate specific competencies and enhance adaptability. Furthermore, Bozeman and Feeney (2007) define mentoring as an informal process that facilitates knowledge transfer, social capital, and psychosocial support, pivotal for professional growth and workplace efficacy.

One of the most relevant concepts regarding mentoring is that it tries to help and comfort the mentees in their learning to increase their potential, develop their skills, and improve their actions so that they become better people (Starcevich & Friend, 1999; Valverde, 2004). Practical mentoring sessions need the mentor's skills and the mentee's knowledge acquisition (Agarwal et al., 2021).

Mentoring can also be classified by different models, for example, a clinical model, a consultation model, a psycho-pedagogical model and a program model, the latter being the most important since it allows comprehensive development; this focuses on a single curriculum and considers the training needs of those mentored (Castellano, 1995). Due to the above, a mentoring program model concerning the organizational field must be distinguished by having individual, relational and organizational aspects (Ghosh, 2014). Mentoring can also be important when it focuses on populations with few opportunities (Valdivia, 2019). In that sense, from an organizational perspective, Portuguez and Gómez (2020) mention that mentoring consists of developing the skills of the mentee who, in the company of a mentor, can learn about entrepreneurship and become motivated to establish a new company. Likewise, Allen et al. (2004) indicate that mentoring is closely related to subjective professional success and professional and job satisfaction indicators. Mentoring can also serve as socio-emotional support and reduce anxiety when starting a venture. In addition, it provides confidence to the mentee, promoting their self-efficacy and forming an "entrepreneurial spirit" (Portuguez & Gómez, 2020). That said, it can be affirmed that mentoring effectively promotes entrepreneurship.

### 1.3. Soft Skills

Goleman (2005) defines soft skills as a person's ability to relate to others sensibly through personal and social skills that will help them find satisfaction in the work environment. However, various authors mention the complex decision to agree on soft skills; however, it is crucial to consider that it is a key element to achieving organizational development and strengthening (Krawczyk-Sokołowska et al., 2019). For some authors, soft skills are considered competencies; therefore, when the term competency is mentioned, it refers to the generic capacity of a professional that helps them execute their work assignments, characterized by effective performance, and when it refers to competencies is understood as a plural term of competencies (Mulder, 2015).

On the other hand, one of the most essential skills is soft skills, attitudes and practices that allow people to learn and relate to the world around them (Ortega, 2016). However, soft skills have even more definitions and can be seen from different perspectives. One of them understands soft skills from social skills such as empathy, creativity, and leadership.

Another perspective regarding soft skills is oriented toward emotional intelligence; in fact, it can be based on the approaches of Goleman (2005), who refers to the fact that people develop attitudes, skills and abilities that explain behaviour, ways of reacting and states of mind to achieve personal and professional success. In addition, Neebel et al. (2015) indicate that soft skills are mainly related to emotional intelligence since it is the ability to identify, know and regulate emotions, significantly influencing relationships and communication with others.

Up to this point, and taking into account that soft skills can be considered a multidimensional variable, it can be divided into the following dimensions:

**Interpersonal Relationships.** Marrero et al. (2018) indicate that they are the characteristics of a person that give them the ability to relate in a meaningful, effective, and regulated way to achieve personal and social development.

**Flexibility.** Diamond (2013) defines Flexibility as the ability to adapt thoughts and behaviours in changing situations. It allows us to understand that the activities carried out are as planned and offers the opportunity to adapt to achieve the objective.

**Resilience.** Masten and Cicchetti (2016) define it as the ability to successfully adapt to contexts that threaten functions, survival, or growth.

**Decision-making.** Wehmeyer (2007) mentions that a "decision" is a development that contains a set of skills that include problem-solving and decision-making to choose one of several options.

So, from a general view, soft skills influence professional development because communicative tasks are solved and responsibilities are assumed (Espinoza & Gallegos, 2020); in addition, they include specific competencies such as social, intellectual and organizational (Gruzdev et al., 2018), in the latter there are other competencies such as teamwork, adaptability, empathy, proactivity, self-criticism, communication and Flexibility (Espinoza & Gallegos, 2020).

### 1.4. Studies on mentoring

Several authors have conducted studies on the use of mentoring, such as Oyarzún-Cristi & Sanhueza-Martínez (2021), which carried out mentoring work with indigenous beneficiaries during 2020 in the framework of the UN Women's Indigenous Women Program, showing. As a result, 36 women benefited from this initiative, of which 33% raised non-reimbursable funding to implement their plans and businesses. Likewise, Headlam-Wells et al. (2005) highlight the relevance and transformative potential of e-

mentoring for professional women, as evidenced in the Empathy-Edge program in the United Kingdom. With 122 participants matched through psychological profiling, the study revealed the benefits and challenges, advocating e-mentoring as a vital tool for career development and overcoming the "glass ceiling". It also highlights the strategic importance of psychological profiling in matching. This novel approach, integrating mentoring, gender in management and computer-mediated communication, brought originality to the field, underlining the need to explore e-mentoring from a European perspective. Also, Crawford & Smith (2005) conducted a study addressing the importance of mentoring in African American women's selection of higher education as a career choice and their development as professionals. The research provided recommendations on how African-American female higher-education administrators can further advance their career choices and development. Mentoring has been identified as a factor leading to upward mobility in employment, success in education, and personal development.

Buendía-Martínez and Carrasco (2013) in their study analyzed the relationships between female empowerment, entrepreneurial activity and rural development in Latin America using a Structural Equation Model, with the Partial Least Squares technique, showing results that confirm the dependency relationships between female empowerment and rural development through entrepreneurial activity and development. (Castillo et al., 2020) conducted a systematic literature review on female empowerment in rural entrepreneurship under a search methodology of bibliographic references contextualized in issues of female empowerment, entrepreneurship, gender, participation and female leadership, resulting in several studies focused on analyzing rural and indigenous female entrepreneurship, public policy with a gender perspective, female empowerment in organizations and rural development of communities; the evidence invites to reflect on gender policies and conditions of rights of rural women, to reduce discrimination by society and state.

A recent study by Tinoco-Giraldo et al. (2020) shows the design of a mobile application called e-mentoring to improve communication and matching in university mentoring processes. A diagnosis of existing applications is made, requirements for the mobile design are identified, and a model that addresses social, graphic, technological and legal factors is proposed. The application seeks to be a meeting point for students and mentors, strengthening academic links. The design is based on previous models, highlighting its usefulness in streamlining educational processes and generating community. The initiative promises to contribute significantly to the quality and efficiency of educational services.

Based on the above, various methodologies have been identified for implementing mentoring, which impacts the sector under study. This highlights the importance of conducting mentoring either face-to-face or virtually, as effectiveness depends on adaptability, effective communication, and a personalized approach to achieving specific objectives. This approach is crucial for the target group, fostering leadership, personal development, and overcoming challenges, thus promoting equity and prosperity in the Andean communities of the study.

Likewise, mentoring women in high Andean regions strengthens female entrepreneurship by considering a methodological model that allows them to be effective in their efforts to generate improvements. In this sense, mentoring is an effective model for fostering entrepreneurship (Portuguez-Castro & Gómez-Zermeño, 2002).

This study aims to determine the impact of a mentoring workshop on enhancing both soft and technical skills in women hailing from high Andean regions engaged in the textile sector. In order to assess soft skills, it is imperative to ascertain the workshop's influence

on the Interpersonal Relations dimension among these women and its impact on the dimensions of Flexibility, Resilience, and Decision-Making.

## 2. Method

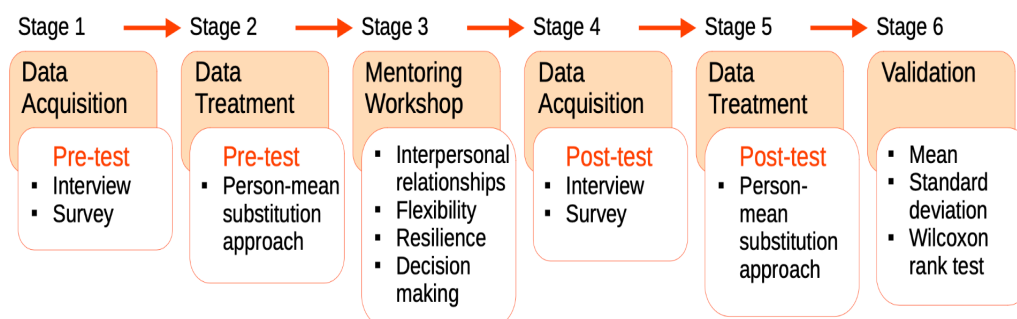
This section provides resources and methods and explains them in detail. This study has two use cases with different data recollection and implementation. The inclusion criteria in both studies were over 18 years of age, living in high Andean areas of Puno, Cusco, and Arequipa, voluntarily agreeing to participate in the study by signing the informed consent form, and working in the textile production sector.

### 2.1 Soft Skills Mentoring

The first one presents a statistical analysis of the impact of soft skills of a workshop about improvements in this subject. This part of the research is based on its purpose of increasing theoretical knowledge for developing a particular science or theory; it is also considered applied because it is oriented toward solving a problem (Ander-Egg, 2011). Likewise, it corresponds to quantitative research since data collection was used to prove the hypothesis based on numerical measurement and statistical analysis to establish behavioural patterns and test theories (Hernández et al., 2014). The study follows a pre-experimental design of a single group with pre-test and post-test, which, according to Cook and Campbell (1979), is a design where a pre-test ( $O_1$ ) is carried out in a single group, then receives the treatment ( $X$ ) and finally a post-test ( $O_2$ ) is carried out. Its notation is  $O_1 X O_2$ .

The methodology implemented consists of 6 stages as presented in Figure 1: In the first stage, a pre-test is conducted via interviews and surveys of all subjects; then in stage 2, a data treatment is performed consisting of a Person-mean substitution approach; in stage 3 the mentoring workshop is performed, this mentoring has four issues: Interpersonal relationships, Flexibility, Resilience and Decision making; in Stage 4 new data is acquired via interviews and surveys (post-test); Stage 5 the new data is treated with Person-mean substitution approach; the last stage is a validation stage, in this stage descriptive and inferential statistics were used (Mean, Standard deviation (SD) and Wilcoxon rank test).

**Figura 1**  
*Methodology for soft skills evaluation*



The questionnaire was prepared by a team of specialists exclusively for this research and submitted to expert judgment. This instrument measures soft skills and comprises four dimensions: Interpersonal Relationships, Flexibility, Resilience and Decision Making. It

consists of 20 items and can be applied to people over 18 years of age. It should be noted that it has a Likert-type measurement scale with three options ranging from "Yes", "Sometimes" and "No". Regarding the validity of the instrument, it was subjected to evidence based on the content through expert judgment. The five experts who evaluated the instrument were professional psychologists who work in the social, community, educational and organizational areas.

The instrument was evaluated qualitatively, considering relevance, representativeness, clarity, and cultural adaptation for the units of analysis. In addition, participants were asked to provide feedback on the instrument's items to improve their understanding of the sample. The observations were taken into account and added to the final version of the instrument.

Internal consistency was evaluated by applying a pilot test to 21 women from the city of Juli in Puno. The alpha coefficient obtained was 0.7 for the entire instrument, which means that it is reliable because it has consistent measurements.

Women from the high Andean areas of Puno, Cusco, and Arequipa participated, specifically Chucuito–Juli, Chincheros, and Tisco, respectively. The sample consisted of 22 women over 18 who work in the textile sector. The participants were chosen through non-probabilistic sampling by judgment. The research team had initial contact with potential participants, and they were subsequently asked to participate in the study.

The present study is part of a research project called "Mentoring Program in Technological Tools for Young Women from Rural High Andean Areas with R&D&I Ventures in the Textile Productive Sector".

The workshop's methodology is related to the pedagogical principles of active, reflective, participatory, and experiential education. This methodology emphasizes continuously developing skills to learn based on the participants' knowledge and needs. The session was organized into three vital methodological moments: awareness and motivation, reflection and construction, and finally, connection and closure.

The study was presented to the previously mentioned research team for review and approval. Subsequently, organizations dedicated to the textile sector working in high-Andean areas were contacted through calls. It began with the city of Puno, where pilot tests were carried out, then Cusco, and finally Arequipa. Next, the representative of each area was contacted to explain the study's benefits. Once the proposal was accepted, the dates for holding the workshops were coordinated through a virtual meeting.

The workshop led by two specialists was applied, together with the support of the authors, collaborating in the resolution of doubts during the development of the test, clarification of terms, assistance with material, specific coordination, verification of filling out answers, discussion with some members of the place about the organizational structure, short-term and long-term objectives, development of the financial aspect in general terms and communication between colleagues.

The workshop took place in person. To begin with, the purpose of the study was explained to the participants, and voluntary participation was voluntary with signed consent to contribute to the research.

The Soft Skills questionnaire was used, developed by a team of specialists exclusively for this research, and submitted for expert judgment. This instrument aims to measure the level of soft skills and is made up of four dimensions: Interpersonal Relationships, Flexibility, Resilience and Decision Making. It consists of 20 items and can be applied to people over 18 years of age. It should be noted that it has a Likert-type measurement scale with three options ranging from "Yes", "Sometimes" and "No".



Regarding the validity of the instrument, it was submitted to content-based evidence through expert judgment. Five experts were asked to evaluate the instrument, including psychologists working in the social, community, educational, and organizational areas. The instrument was evaluated qualitatively, considering relevance, representativeness, clarity and cultural adaptation for the units of analysis. In addition, they were asked to provide feedback on the instrument items and thus improve the sample's comprehension. The comments were taken into account and added to the final version of the instrument. On the other hand, internal consistency was evaluated by applying a pilot test to 21 women from the city of Juli in Puno. The alpha coefficient obtained was .70 for the whole instrument, meaning it has consistent measures and is, therefore, reliable.

This investigation respected the rights of the people who took part. Firstly, they were made aware that participation is voluntary and that they have the right to withdraw at any time; then, they were given informed consent, which informed them of the purpose, objective, general information of the workshop, and the duration of the session. The investigation also assures them that all the information collected will be confidential and guarantees that it will not be used for other reasons. Likewise, they were made aware that the evaluations do not have the purpose of causing any type of harm, whether physical or psychological, and any related harm was avoided to the greatest extent possible.

Finally, the data obtained from the information collection were digitized in a Microsoft Excel spreadsheet; subsequently, such data were subjected to an imputation process. The results were then processed in the JAMOVI 2.3.18 statistical software. In the exploratory analysis, missing data ( $n = 10$ ) had to be imputed using the person-mean substitution approach (Downy & King, 1998). Descriptive statistics were used through the Mean and Standard Deviation, and inferential statistics were used to compare the measures (pre- and post-test). Due to the sample size ( $n < 30$ ), non-parametric tests were applied (Wilcoxon rank test).

## 2.2 Technological Skills Mentoring

This study delves into the impact of mentoring programs to enhance technological skills within southern Peru, focusing on the regions of Arequipa, Cusco, Puno, Moquegua, and Tacna. These regions were chosen based on the presence of traditional textile associations primarily catering to women, especially prevalent in the high Andean zones (Aliaga Saenz, 2023).

In Arequipa, the selected association in the Tisco district of the Caylloma province comprised 24 women, forming part of a broader network across the high Andean textile sector. Similarly, in Puno, the association located in Chucuito, approximately 19.4 km from the city and 3875 meters above sea level, consisted of 13 women, echoing the network pattern observed in Tisco. Moving on to Cusco, renowned for its rich cultural heritage, the association in the Chincheros district, situated 3754 meters above sea level, comprised 20 women sharing similar characteristics to those in previous regions.

In contrast, Moquegua and Tacna exhibited a different scenario, with artisan textile associations being disorganized, inactive, or defunct, precluding evaluation. Nonetheless, insights were gleaned regarding the precarious state of textile associations in these regions. Despite challenges such as limited internet access in remote areas and the rugged geography of the Peruvian altiplano, most participants possessed mobile devices, rendering them suitable candidates for mentoring in technological tools.

Although the selected population demonstrated the potential to adapt to technological tools, their proficiency remained limited. The absence of telecommunications

infrastructure in remote areas hindered access to essential services, underscoring the scarcity of information regarding technological tool utilization in such contexts (Auladell et al., 2020).

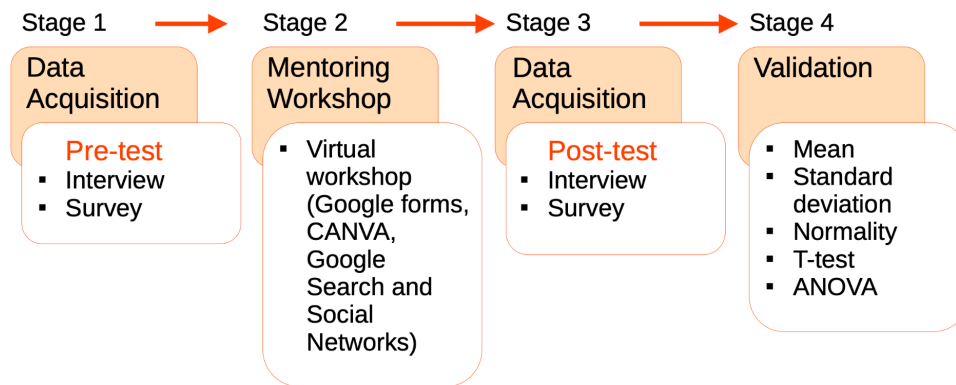
Participants, aged between 18 and 40 years, hail from cultures deeply rooted in the Peruvian highlands, with textile craftsmanship holding significant cultural and economic importance (Vargas, 2019). Legislative measures such as Law No. 29073 and the Regulation of the National Registry of Artisans, along with the National Council for the Promotion of Artisan and Development of Artisan Activity DS 001-2008-MINCETUR, implemented in 2022, aimed at recognizing and uplifting artisans' role in cultural preservation and economic development (Tian et al., 2018). The Ministry of Tourism spearheads policy formulation, regulation, and evaluation, fostering investment and innovation within the artisan sector, including textile artisans.

In selecting study groups, emphasis was placed on artisans producing textiles imbued with cultural significance, recognizing the need for greater visibility and appreciation of artisanal craftsmanship in the region.

The methodology implemented consists of 4 stages, as presented in Figure 2: In the first stage, a pre-test is conducted via Interviews and surveys of all subjects; in stage 2, the mentoring workshop is performed as a virtual workshop; this mentoring has four issues: Google Forms, Canva, Google Search and Social Networks; in Stage 3 new data is acquired via interviews and surveys (post-test); the last stage is a validation stage, in this stage descriptive and inferential statistics were used (Mean, Standard deviation, Normality, T-test and ANOVA).

### **Figura 2**

*Methodology for technical skills evaluation*



The surveys had two parts as part of an evaluation, pre and post-mentoring, to know the current state of our study population by talking about technological tools. This tool was applied in the regions with a significant number of people per association. On the other hand, the regions that presented disintegrated or disjointed associations were personally interviewed to determine the reasons for this occurrence. After obtaining information from the associations, a virtual workshop plan was implemented, comprising platforms such as Google Forms, Canva, Google Search, and social networks. These digital tools were considered fundamental for developing necessary capacities and essential skills in the textile commercial area within the reach of the associations in southern Peru. The cross-cutting competencies survey was reviewed by experts and statistically analyzed for reliability and validity (Agarwal, 2011).

The mentoring program in technological tools, which is called "PROMETEC MUJER", starts with the creation of a web page of free access for the application of face-to-face and virtual mentoring for a long-term projection with the associations where you can find all the didactic material, experiences and the database of the information collected according to previous segments of this research in the high Andean regions of southern Peru such as Cusco, Puno, Arequipa, Moquegua and Tacna, Puno, Arequipa, Moquegua and Tacna, with the vision of contributing to the development of necessary capacities and essential skills in the commercial textile area within reach of the associations of southern Peru, economic and social empowerment of its participants so that they assume leadership in their community in each region. Therefore, the method used was Flangant's critical incident technique (Agarwal, 2011; Serrat, 2017), which consists of data collection, deciphering the goals of the results sought and data interpretation.

Descriptive statistics analyses (mean, SD, coefficient of variation, and normality) were performed, in addition to inferential analyses using the paired samples t-test to evaluate the mentoring program's effect. An ANOVA was also used to evaluate the differences between the Pre-test and Post-test. A 95% confidence level was assumed in all analyses. Analyses were performed using OriginLab Pro statistical software.

### 3. Results

The impact of mentoring on the development of technological tools is addressed through mentoring development and statistical analysis.

The workshops focused on technological tools applied to the associations in the different regions. Before the workshops, a pre-test was applied in person to determine which competencies were present and which were not. Table 1 details the competencies applied in the workshops, such as Internet search, which were initially complicated. Google Forms and social networks were the most accessible workshops for the study population to understand. One of the most relevant issues was the time of each workshop since the attention of each participant decreased significantly through the exposure time.

*Table 1.*  
*Mentoring Development Summary.*

<b>1st mentoring</b> <b>14/8/2023</b>	<b>2nd mentoring</b> <b>11/9/2023</b> <b>Google forms</b>	<b>3rd mentoring</b> <b>18/9/2023</b> <b>Canva</b>	<b>4th mentoring</b> <b>11/10/2023</b> <b>Social networks</b>
This workshop lasted 2 hours, the main aspects discussed were keywords in Google, search for information from reliable sources, account setup and/or email creation.	This workshop lasted 2 hours, and the main aspects covered were web platform entry, question editing, question sorting, form saving and form submission via link.	This workshop lasted 3 hours and the main aspects covered were: access to the web platform, registration on the web platform, creation of new documents, creation of documents through templates, text editing, the "insert" function, image editing, insertion of graphic elements, and the use of the "insert" function.	This workshop lasted 2 hours, the main aspects exposed were the basics of using Instagram, Facebook and WhatsApp business accounts

The application of technological tools followed a systematic approach to ensure optimal learning of the fundamentals in each workshop. Internet search sessions ingrained in the study participants the significance of utilizing appropriate keywords and accessing reliable sources of information. Subsequently, the subsequent course predominantly focused on enhancing logical reasoning, coherence, and questionnaire management skills. Additionally, it facilitated the creation of a post-test template, expediting the data processing during the post-test evaluation phase. Another tool was specifically designed to foster creativity and critical thinking in textile craftsmanship, tailored to the needs of the textile craftswomen. Finally, the last segment of the workshops delved into leveraging social networks, primarily aimed at expanding their professional network strategically and familiarizing them with the basics of business account management for effective venture promotion.

A comprehensive statistical analysis was conducted, encompassing normality tests and descriptive assessments of the pre-test and post-test data, as detailed in Table 2. The results of the normality test, represented by p-values, indicated that the data from the study population exhibited a normal distribution. Furthermore, fundamental metrics such as the coefficient of variation, deviation, and standard error were examined. The coefficient of variation, consistently below 30% across all regions, suggested a degree of uniformity in data variability, indicative of measurement stability. Standard deviation, ranging from 3 to 8 across all regions, highlighted the dispersion of data relative to the mean, with observed variability attributed to inherent sample heterogeneity. Notably, the standard error, ranging from 0 to 2 for all regions, signified precise and consistent estimation based on the samples. Despite deviations from normality, the low level of error instilled confidence in the accuracy of measurements. These findings underscored the necessity of exercising caution and acknowledging sample heterogeneity in both study design and analysis moving forward.

*Table 2.*  
*Statistical table of normality, p-value and decision.*

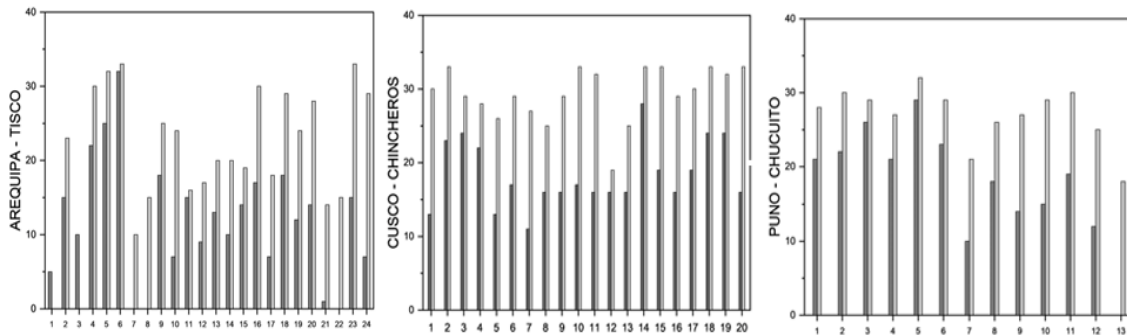
		<b>Statistician</b>	<b>p-value</b>	<b>Decision at 5%.</b>
<b>TISCO</b>	Pre test	0.95853	0.40967	Does not reject normality
	Post test	0.9473	0.2366	Does not reject normality
<b>CHUCHUITO</b>	Pre test	0.9534	0.65065	Does not reject normality
	Post test	0.88348	0.07951	Does not reject normality
<b>CHINCHEROS</b>	Pre test	0.9169	0.08636	Does not reject normality
	Post test	0.90471	0.5059	Does not reject normality

Figure 3 below compares the pre-test and post-test applied to women's associations in the Alto Andean textile area, offering a valuable perspective on the effectiveness of mentoring and its impact on skills related to specific technological tools. Both moments' differences and positive results are significant indicators of the benefits obtained. In the pre-test, women's initial skills and knowledge of technological tools are assessed, providing a baseline for understanding their level of competence prior to receiving mentoring. At this point, it is possible to identify areas of opportunity and determine

specific training needs. On the other hand, the post-test is applied after the mentoring, serving as a post-evaluation to measure the impact of the mentoring sessions on the development of technological skills.

**Figura 3**

*Comparison between the results of the Pre-test (left bar) and Post-test (right bar) carried out in the Regions of Arequipa-Tisco, Puno-Chucuito and Cusco-Chincheros.*

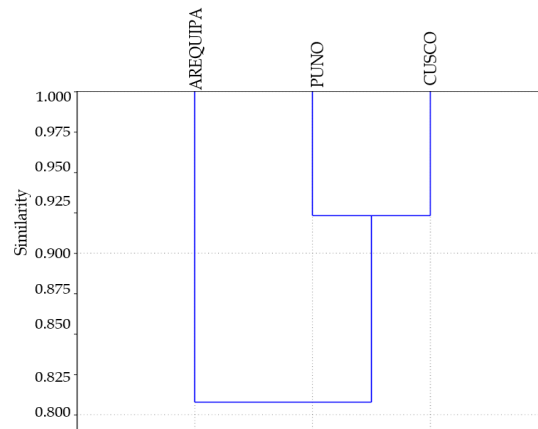


On the other hand, Figure 4 shows the construction of a dendrogram using Jaccard's similarity test between the study populations in the regions of Arequipa, Puno and Cusco, providing a graphical representation of the similarity relationships between these geographical areas. In the dendrogram, distances between populations are calculated using Jaccard's index, which measures the similarity between sets, being particularly useful when working with binary data, such as the presence or absence of certain elements.

Notably, the result reveals that the regions of Puno and Cusco are the most similar to each other. This finding may have significant implications, especially considering women's textile associations and the pre-test results on technological tools. The similarity between Puno and Cusco could indicate that they share similar socioeconomic, cultural or geographic contexts, factors that could influence the creation and sustainability of women-led textile associations in both regions. It could suggest that successful strategies implemented in one region could be transferable or adapted to the other, promoting an exchange of good practices. Regarding the pre-test on technological tools, the similarity between Puno and Cusco could indicate common patterns of access, use, and perception of technologies among the study populations. This knowledge may be valuable when designing interventions or programs involving technological tools since effective strategies implemented in one region may be applicable and effective in the other.

**Figura 4**

*Jaccard's test of similarity between the pre-test scores evaluated in the regions*



Notably, the result reveals that the regions of Puno and Cusco are the most similar to each other. This finding may have significant implications, especially considering women's textile associations and the pre-test results on technological tools. The similarity between Puno and Cusco could indicate that they share similar socioeconomic, cultural or geographic contexts, factors that could influence the creation and sustainability of women-led textile associations in both regions. Concerning the pre-test on technological tools, the similarity between Puno and Cusco could indicate common patterns of access, use and perception of technologies among the study populations. This knowledge may be valuable when designing interventions or programs involving technological tools since effective strategies implemented in one region may be applicable and effective in the other.

In order to assess the influence of strengthening soft skills in women in the textile sector, we conducted a mentoring workshop. Comparisons were made between the pre-and post-test measurements of the soft skills dimensions.

First, Table 3 presents the descriptive statistics and the comparison between the measures (pre-post) of dimension 1: Interpersonal Relations. No statistically significant differences were found between the measures.

*Table 3.*

*Comparison between the pre and post-test measures of the Interpersonal Relations dimension.*

Measures	M	Mdn	DE	W	p
Pre-test	14.5	15	.67	22	1
post-test	14.5	15	.67		

( $W=22, p = 1$ ). That is, the workshop did not have an effect on the Interpersonal Relations dimension.

Table 4 presents the descriptive statistics and the comparison between the measures (pre-post) of dimension 2: Flexibility. Statistically significant differences were found between the measurements ( $W=46, p = .047$ ). Consequently, the workshop had an effect on the Flexibility dimension.

Table 4.

*Comparison between the pre and post-test measures of the Flexibility dimension.*

Measures	M	Mdn	DE	W	p
Pre-test	13	13	1.30	46	.047
post-test	13.7	14	1.50		

Table 5 presents the descriptive statistics and the comparison between the measures (pre-post) of dimension 3: Resilience. No statistically significant differences were found between the measurements ( $W=31$ ,  $p = .89$ ). That is, the workshop did not have an effect on Resilience.

Table 5.

*Comparison between the pre and post-test measures of the Resilience dimension*

Measures	M	Mdn	DE	W	p
Pre-test	14.3	14	.71	31	.89
post-test	14.3	14	.72		

Table 6 presents the descriptive statistics and the comparison between the measures (pre-post) of dimension 4: Decision Making. No statistically significant differences were found between the measurements ( $W=55$ ,  $p = .51$ ). In other words, the workshop did not have an effect on the Decision-Making dimension.

Table 6.

*Comparison between the pre and post-test measures of the Decision-Making dimension*

Measures	M	Mdn	DE	W	p
Pre-test	14.3	14.5	.82	55	.51
post-test	14.2	14.5	1.08		

The descriptive statistics and the comparison between the pre-test and post-test measurements of the total Soft Skills score, are no statistically significant differences were found between the measurements ( $W=54.5$ ,  $p = .18$ ). Therefore, the workshop did not have an effect on Soft Skills, as we can see in Table 7.

Table 7.

*Comparison between the pre and post-test measures of the total score of Soft Skills.*

Measures	M	Mdn	DE	W	p
Pre-test	56	55.9	2.58	54.5	.18
post-test	56.6	56.5	2.95		

## 5. Discussion

Mentorships, as noted by Smith et al. (2016), have the potential to be optimal tools for generating opportunities for change. However, the results obtained in this study do not fully support the effectiveness of the mentorship workshop, as no significant differences

were observed between pre-test and post-test measurements using the Wilcoxon rank-sum test concerning the Soft Skills variable. This lack of improvement could be attributed to most participants having a basic educational level, i.e., a population with primary education and low literacy. This limitation may have hindered effective communication between mentors and mentees. It is important to note that literacy is a social and discursive aspect that manifests in various sociocultural situations (Cragnolino & Lorenzatti, 2013). Riquelme and Quintero (2017), citing the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2006), define literacy as a learning process and a set of individual skills. The former focuses on the learning process, while individual skills are cognitive reading and writing skills developed at different levels independently. From this perspective, limited information reception may have hindered the learning process and reduced individual capacities, which could have significantly undermined the effectiveness of mentorships as agents of change. This could explain why mentorship workshops did not yield significant results in this study.

Furthermore, this result is somewhat related to what Rhodes et al. (2006) suggest, as they point out that no improvement in cognitive skills is evident due to the lack of a consecutive mentoring program. On the other hand, it is necessary to consider that the ideas conveyed in the workshop must be clear, and the content should be carefully verified (Pryce et al., 2007). Therefore, it can be inferred that using technical terms may have been one of the reasons why the mentees did not optimally grasp the knowledge acquisition. Similarly, it is considered that the predisposition of the learners is influenced negatively, as Agarwal et al. (2021) suggest that effective results require the reception of knowledge acquisition. Additionally, the impact varies according to related factors such as participation, session quality, frequency of shared time, and stressful factors affecting the mentees (Pryce et al., 2007).

On the other hand, another cause may be attributed to the research's pre-experimental design. Salas (2013) mentions that such designs have several limitations, with some compromising internal and external validity. Similarly, Kerlinger and Lee (2001) suggest that these designs lack adequate control of variables and possess limited scientific value, hindering the construction of theories based on the data found. However, they hold value in applied research, which can be used to address specific problems.

In a different vein, no significant differences were observed regarding the comparisons between the pre-test and post-test about the Wilcoxon Rank Sum Test concerning the dimensions of soft skills, specifically Interpersonal Relationships, Resilience, and Decision Making. In other words, these dimensions operated similarly for the participants in the pre-test and post-test, indicating that the mentoring workshops did not bring about any considerable change.

However, significant differences were found in the comparison between the pre-test and post-test regarding the dimension of Flexibility. In other words, the dimension of Flexibility operated differently for the participants in the pre-test and post-test. This result demonstrates that the mentoring workshops changed the participants' Flexibility dimension. This change is arguably one of the most crucial; in the study by Espinoza and Gallegos (2020), they indicate that the minimum soft skills required for employment and Flexibility, from an organizational perspective, are fundamental for professional development.

The findings highlight the importance of maintaining soft skills that strengthen women's entrepreneurship from high Andean regions and collaborating with workshops that promote personal, economic, organizational, and community development. Although statistically significant results regarding the influence of mentoring workshops were not



obtained, the effectiveness in developing thoughts and behaviours adaptable to changing contexts is underscored, as mentioned in the Flexibility dimension. The lack of a positive influence from the soft skills workshop highlights the importance of considering factors such as the number of sessions, sociodemographic characteristics, sample size, and the time available to participants.

## 6. Conclusions

In conclusion, our study reveals significant advancements in technological proficiency among participants following the mentoring intervention. The observed improvements in the use of specific tools like Google, Internet search, Canva, Google Forms, and social media platforms such as Instagram and WhatsApp underscore the positive impact of mentoring on enhancing digital skills, particularly within the high Andean textile community. These findings affirm the efficacy of our mentoring program in achieving its intended objectives.

However, the analysis of pre-test and post-test measures presents a nuanced picture. While overall results did not show statistically significant effects, a closer examination reveals noteworthy disparities across specific dimensions. Notably, there were no significant differences in interpersonal relationships, resilience, or decision-making skills. In contrast, a statistically significant improvement was observed in the flexibility dimension, indicating a positive influence of the mentoring workshop in this particular area. These nuanced findings emphasize the importance of conducting thorough analyses to understand the multifaceted impacts of mentoring on participants' personal and professional development.

Therefore, it is crucial to recognize that while our study suggests positive outcomes for technological skill development, the conclusions drawn regarding soft skills workshops may not be universally applicable. Each mentoring program operates within unique contexts and may yield varied results. Thus, caution should be exercised when extrapolating findings from this study to other settings.

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## Authors' statement on the use of LLMs

This article has not used texts from (or generated) an LLM (ChatGPT or others) for its writing.

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