American Research Journal of Humanities & Social Science (ARJHSS)
E-ISSN: 2378-702X
Volume-09, Issue-11, pp-07-15
www.arjhss.com

Research Paper **Open Access**

Proposal for the Optimization of Technological Tools among Women Entrepreneurs in El Salvador

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Resumen
Las micro y pequeñas empresas (MYPES) lideradas por mujeres enfrentan brechas en sus competencias digitales que limitan el aprovechamiento estratégico de las Tecnologías de la Información y la Comunicación (TIC). Este artículo presenta una propuesta de investigación aplicada orientada a optimizar el uso de las TIC de comunicación en mujeres empresarias de Santa Ana, El Salvador. La metodología se estructura en dos fases: un diagnóstico de la competencia digital mediante encuestas, grupos focales y análisis de perfiles digitales, seguido por un programa de capacitación bajo el enfoque «aprender haciendo», complementado con comunidades de aprendizaje y mentorías grupales. Al encontrarse en etapa de planificación, los resultados se expresan como metas verificables: aplicación de al menos 30 encuestas, realización de dos grupos focales, análisis de diez perfiles digitales, desarrollo de cinco módulos formativos, tres talleres con asistencia mínima del 80 % y dos sesiones de mentoría. La discusión contrasta estas metas con la evidencia empírica regional y nacional, identificando limitaciones y líneas de evaluación futura. Se concluye que la propuesta constituye una ruta metodológica viable para mitigar la brecha digital y fortalecer el desarrollo económico local.

Palabras clave: MYPES, mujeres empresarias, competencias digitales, TIC, capacitación, Santa Ana.

ABSTRACT:-
Women-led micro and small enterprises (MSEs) often face challenges in developing the digital competencies required to strategically leverage Information and Communication Technologies (ICTs) for business growth and competitiveness. This article presents an applied research proposal aimed at enhancing the use of communication-oriented ICTs among women entrepreneurs in Santa Ana, El Salvador. The proposed intervention is structured around two complementary phases. The first phase consists of a comprehensive assessment of participants' digital competencies through surveys, focus groups, and the analysis of digital business profiles. The second phase involves a capacity-building program grounded in experiential learning principles, supported by collaborative learning communities and group mentoring activities.

As the project remains at the planning stage, outcomes are framed as measurable objectives rather than empirical findings. These objectives include the administration of at least 30 surveys, the implementation of two focus groups, the evaluation of ten digital profiles, the development of five training modules, the delivery of three workshops with a minimum attendance rate of 80%, and the

facilitation of two group mentoring sessions. The discussion situates these proposed actions within the broader context of digital inclusion, women's entrepreneurship, and small business development, drawing on both regional and national evidence. Potential limitations and avenues for future evaluation are also considered. The article concludes that the proposed intervention provides a feasible and context-sensitive framework for strengthening digital capabilities, fostering the strategic use of ICTs, and contributing to local economic development through the empowerment of women entrepreneurs.

Keywords: women entrepreneurs; micro and small enterprises (MSEs); digital competencies; information and communication technologies (ICTs); digital inclusion; capacity building; El Salvador.

I. INTRODUCTION

Digitalization has become one of the main drivers of business competitiveness in recent decades. Organizations that adequately incorporate digital technologies achieve higher levels of efficiency, innovation, and adaptability in changing environments (Vial, 2019).

In Latin America, micro and small enterprises (MSEs) account for most productive units and are an important source of employment and income. However, many of these organizations face limitations related to technological access, specialized training, and digital transformation (CEPAL, 2022). The digital divide is not limited to access to technology: structural knots of gender inequality persist that shape women's access to, use of, and appropriation of Information and Communication Technologies (ICTs) and restrict their ability to benefit from the digital economy (Bercovich & Muñoz, 2022).

The situation is particularly relevant from a gender perspective. Several international studies indicate that women entrepreneurs face additional barriers related to access to financing, technology training, and participation in innovation ecosystems (UN Women, 2022).

In El Salvador, MSEs account for more than 95% of the country's business units and generate a significant share of national employment. Within this group, women entrepreneurs play a key role in sectors such as commerce, services, tourism, gastronomy, and artisanal manufacturing. Nevertheless, significant challenges remain regarding the strategic use of digital technologies.

In El Salvador, micro and small enterprises play a fundamental role in job creation and in stimulating the local economy. However, many of them have difficulty incorporating digital tools that strengthen their competitiveness and sustainability. This situation is particularly significant for women entrepreneurs who, in addition to facing the challenges inherent in business management, often experience limited access to technological resources, specialized training, and opportunities for digital innovation.

Although digital transformation has advanced considerably in recent years, gaps persist in the development of digital competencies geared toward the strategic use of technologies for business purposes. These limitations restrict entrepreneurs' ability to take advantage of tools related to digital marketing, e-commerce, customer communication, and the efficient management of their businesses.

The city of Santa Ana is one of the main economic hubs of western El Salvador and concentrates significant commercial activity led by women. Despite this, many women entrepreneurs continue to use technological tools only for basic operational purposes, overlooking their strategic potential to improve business competitiveness.

Therefore, this article proposes a comprehensive program to strengthen digital competencies, aimed at optimizing the use of communication ICTs among women entrepreneurs in Santa Ana.

II. OBJECTIVES

1.1 General objective: To design an intervention proposal to optimize the use of ICTs among women entrepreneurs in Santa Ana.

1.2 Specific objectives:

1.2.1 To assess their digital competence,

1.2.2 To design a training program based on the assessment.

III. BACKGROUND ON EL SALVADOR

3.1 The Situation of Salvadoran MSEs

Micro and small enterprises are one of the fundamental pillars of El Salvador's productive fabric. According to the National Commission for Micro and Small Enterprises (CONAMYPE, 2023), this sector accounts for most of the country's economic units and plays a significant role in generating employment and income for thousands of Salvadoran families.

MSEs contribute significantly to economic development by generating local employment, promoting productive inclusion, strengthening municipal economies, and stimulating commercial activity across economic sectors (CONAMYPE, 2023). Nevertheless, despite their relevance, a significant share of these firms continue to face challenges related to access to financing, innovation, and the incorporation of digital technologies into their management and marketing processes (CEPAL, 2022; OECD, 2021).

3.2 Business Digitalization in El Salvador

The COVID-19 pandemic significantly accelerated technology adoption among Salvadoran companies, driving the use of digital tools to maintain communication with customers and suppliers. The most widely used technologies include Facebook Business, Instagram, WhatsApp Business, e-commerce platforms, and videoconferencing applications (FUSADES, 2023).

However, several studies indicate that much of this adoption occurred as an immediate response to the conditions imposed by the health emergency rather than as part of comprehensive digital transformation strategies (CEPAL, 2022; FUSADES, 2023). As a result, many companies continue to use these tools at a basic level, without fully leveraging their potential to generate sustainable competitive advantages in the long term.

3.3 Inequalities in Access to and Use of Digital Technologies

Inequalities in access to, use of, and benefit from digital technologies remain a significant challenge in Latin America (Bercovich & Muñoz, 2022; UN Women, 2022).

Among the main limitations identified for women entrepreneurs are less access to specialized technology training, restricted access to financing, limited participation in business and technology networks, and the persistent burden of domestic responsibilities and unpaid care work (Bercovich & Muñoz, 2022). In addition, women's underrepresentation in technology- and innovation-related sectors widens the differences in opportunities for inclusion in the digital economy (UN Women, 2022).

These conditions limit many entrepreneurs' ability to adopt and strategically leverage digital technologies for the benefit of their businesses' competitiveness and sustainability (Bercovich & Muñoz, 2022).

3.4 The Santa Ana Context

The municipality of Santa Ana is one of the main economic centers of El Salvador, characterized by significant commercial, industrial, and service activity. In recent years, there has been significant growth in women-led ventures, especially in sectors such as commerce, gastronomy, tourism, personal services, and professional activities (CONAMYPE, 2023).

Nevertheless, many women entrepreneurs continue to rely on traditional models of communication and commercial management, with limitations in areas such as digital marketing, web analytics, process automation, digital content management, and customer service through technological platforms (FUSADES, 2023; CEPAL, 2022). These limitations reduce opportunities for expansion and competitiveness in increasingly digitalized environments.

IV. LITERATURE REVIEW

4.1 Digital Transformation and Business Competitiveness

Digital transformation is a complex process involving organizational, cultural, and strategic changes driven by the incorporation of digital technologies (Vial, 2019). Bharadwaj et al. (2013) argue that digital technologies have ceased to be merely supporting tools and have become strategic elements capable of transforming business models and sources of value creation.

In this context, Porter and Heppelmann (2015) maintain that digital connectivity enables companies to generate new competitive advantages through continuous interaction with customers and markets.

4.2 Digital Competencies as a Strategic Resource

From the perspective of the resource-based view, digital competencies can be considered strategic resources capable of generating sustained competitive advantages (Barney, 1991). However, the availability of resources is not sufficient on its own. Teece (2018) notes that organizations must develop dynamic capabilities that allow them to continually adapt those resources in environments characterized by rapid technological change. Under this logic, digital competencies are fundamental capabilities for business competitiveness in the digital economy.

4.3 Digital Inclusion and Women Entrepreneurs

Beyond having adequate digital competencies, it is important to assess women's digital inclusion, given that it remains a challenge for Latin American countries. Bercovich and Muñoz (2022) point out that women face obstacles related to access to, development of, and use of digital skills, which limits their full participation in the digital economy. Similarly, UN Women (2022) emphasizes that structural inequalities persist in financing, technology training, and participation in innovation-related sectors.

In El Salvador, FUSADES (2023) identifies significant challenges related to technology adoption among MSMEs, particularly those led by women.

4.4 Communication Technology Tools for Business

Communication technology tools have taken on a central role in contemporary business strategies. Kaplan and Haenlein (2010) indicate that social media make it possible to establish two-way relationships with consumers, facilitating the building of digital communities around brands.

Likewise, Tuten (2023) asserts that digital platforms contribute to strengthening business visibility, customer loyalty, and the generation of competitive advantages in highly dynamic markets.

4.5 ICTs and Business Competitiveness in SMEs

The literature shows a positive relationship between ICT adoption and the business performance of small firms. The OECD (2021) maintains that digital transformation increases productivity, improves operational efficiency, and expands access to markets. Likewise, CEPAL (2022) notes that digital technologies facilitate business innovation and strengthen the competitive capacity of Latin American micro and small enterprises.

V. METHODOLOGY

5.1 Design

An applied research proposal is put forward, consisting of an intervention in two consecutive phases: assessment and training. The assessment integrates quantitative techniques (survey) and qualitative techniques (focus groups and analysis of digital profiles), in line with the mixed-methods approaches described by Hernández-Sampieri and Mendoza (2018), so that numerical information on ICT use is complemented by the participants' experiences and perceptions. The findings of the first phase guide the content of the second.

5.2 Participants

The target population consists of women who run micro or small businesses in the city of Santa Ana. The survey will be administered to at least 30 women entrepreneurs; the focus groups will bring together between five and eight participants each, and the practical case analysis will be conducted on the digital channels of 10 participants. A non-probability, voluntary sample is proposed, recruited through an open call, which will make it possible to form a group of those with a genuine interest in the program.

5.3 Techniques and Instruments

Diagnostic survey

A digital questionnaire will be developed in Google Forms, with closed and open-ended questions, exploring five dimensions: business profile, current ICT use, perceived competence, difficulties, and needs. It is suggested that the perceived-competence items be organized according to the five areas of the European DigComp 2.2 framework: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving (Vuorikari et al., 2022), which would make it easier to compare results against a recognized benchmark.

Focus groups

Virtual or in-person sessions will be organized with small groups of women entrepreneurs to explore the survey responses in greater depth. The question guide will favor "why" and "how" questions in order to obtain richer stories, experiences, and perceptions, following the methodological recommendations of Krueger and Casey (2015).

Practical case analysis

With their authorization, the social media accounts, websites, or other digital channels of some participants will be analyzed as a form of internal benchmarking, in order to identify common patterns, good practices to replicate, and frequent mistakes to correct.

5.4 Procedure

Phase 1: Assessment

The survey will be administered over a period of four weeks. The two focus groups will be held before the end of the first month, and the analysis of the 10 digital profiles will be carried out in parallel. The results of the three techniques will be integrated into an assessment report to guide the design of the training.

Phase 2: Training program

Based on the assessment, a modular syllabus will be developed, along with practical materials: presentations, downloadable PDF guides, and "step-by-step" video tutorials. Sessions will be delivered in a workshop format, virtual or hybrid, lasting 1.5 to 2 hours, following a "learning by doing" methodology: after each theoretical concept, participants will spend time applying it immediately to their own business. This approach draws on experiential learning theory, which understands learning as a process in which knowledge is constructed from experience (Kolb, 1984).

In addition, a WhatsApp or Telegram group exclusive to the participants will be created, conceived as a learning community and networking space, in the sense of the community of practice put forward by Wenger (1998). Finally, a group mentoring or consulting system will be established through "office hours" sessions in small groups, to provide follow-up and answer questions.

5.5 Data Analysis

For the analysis, it is proposed to use descriptive statistics (frequencies and percentages) for the closed survey data, and thematic analysis for the open-ended responses and focus group transcripts. The digital profiles will be compared using a comparative matrix of observed practices. Triangulating the three sources will make it possible to identify matches and divergences between what the women entrepreneurs say, what they express in the groups, and what they actually do on their channels.

5.6 Ethical Considerations

Participation will be voluntary and informed consent will be requested, including express consent to analyze each entrepreneur's digital channels. Data confidentiality will be guaranteed, and data will be used exclusively for the purposes of the project. This precaution is particularly relevant because, at the conclusion of its study, FUSADES (2023) noted that El Salvador still did not have a specific personal data protection law.

VI. EXPECTED RESULTS AND GOALS

Because this is a proposal at the design stage, no collected data are yet available. This section therefore presents the anticipated results, expressed as measurable goals with defined deadlines, which will serve as the criterion for evaluating the achievement of each specific objective (Table 1).

Table 1 Expected Results by Specific Objective, Action, and Goal

Specific objective	Action	Goal	Deadline
Assess digital competence	Diagnostic survey	Administer the survey to at least 30 women entrepreneurs	4 weeks
Assess digital competence	Focus groups	Conduct 2 focus groups with at least 5 participants each	Before the end of the first month
Assess digital competence	Practical case analysis	Analyze 10 digital profiles	Assessment phase
Implement the training program	Program and materials design	Modular syllabus of 5 modules with practical materials (PDF, presentations, tutorials)	6 weeks
Implement the training program	Practical workshops	Deliver at least 3 workshops with a minimum attendance of 80%	Training phase
Implement the training program	Learning community	Add 100% of participants to the WhatsApp group	Before the second workshop
Implement the training program	Group mentoring	Hold 2 mentoring sessions for follow-up and answering questions	Two months after the training

Note. Prepared by the authors based on the project's matrix of objectives, actions, and goals.

Regarding the first objective, the expected outcome is a diagnostic report describing the profile of the participating businesses, the tools they use, the perceived level of digital competence, and the most frequent difficulties and training needs, together with a set of good practices and common mistakes identified in the 10 profiles analyzed. Regarding the second objective, the plan is to have a modular program of five modules, reusable support materials, an active learning community including all participants, and a scheme of follow-up support after the workshops.

The proposal is based on an intervention model aimed at strengthening the digital competencies of women entrepreneurs in the city of Santa Ana, through a strategy structured in two complementary phases: assessment and training.

As shown in Figure 1, the process begins with the identification of digital needs and competencies through assessment tools, the results of which serve as the basis for designing relevant training actions. Subsequently, the implementation of training, support, and collaborative learning activities strengthens technological capabilities that can translate into greater use of digital tools for business management, customer communication, and the positioning of businesses in increasingly digitalized environments.

Figure 1
Intervention Model for Optimizing the Use of ICTs among Women Entrepreneurs in Santa Ana



Note. Prepared by the authors based on the intervention proposal designed to strengthen digital competencies and the strategic use of communication technologies among women entrepreneurs in Santa Ana, El Salvador.

VII. DISCUSSION

The proposed goals respond to barriers that the literature has already documented. A local assessment is pertinent because national data show that differences in technology use depend less on gender per se than on the type and size of the business: the sectors and smaller firms where women tend to be concentrated show lower levels of access and use (FUSADES, 2023). The survey and focus groups will make it possible to verify whether women entrepreneurs in Santa Ana reproduce that pattern and what specific needs they express, which is consistent with the recommendation that programs aimed at MSMEs take into account the characteristics of the firms and of the people who run them (FUSADES, 2023).

The training program seeks to fill an identified gap: the low proportion of firms that receive training on digital transformation topics and the predominance of basic communication uses (FUSADES, 2023). By focusing on brand visibility, customer loyalty, and operational efficiency, the proposal aims to move from an instrumental use of social media to a strategic one. Likewise, the "learning by doing" methodology is aligned with the idea that digital skills are not limited to technical mastery but include the ability to appropriate the tools and use them to transform one's own reality (Bercovich & Muñoz, 2022).

Based on the literature analysis, it is recommended that at least one of the five modules address digital security and data protection. FUSADES (2023) reported that almost half of the business owners with the highest internet use had experienced some form of digital harassment, and that knowledge of cybersecurity and data protection is limited among MSMEs. In addition, safety is one of the digital competence areas of the DigComp 2.2 framework (Vuorikari et al., 2022), so its inclusion would strengthen the program's comprehensiveness.

The learning community and group mentoring are the components with the greatest potential for sustainability. Conceived as a community of practice, the network of participants can continue sharing experiences once the workshops have ended (Wenger, 1998). In addition, for many women, having technology in their businesses makes it easier to reconcile business activity with family responsibilities (FUSADES, 2023), so virtual or hybrid formats and flexible schedules are consistent with the participants' real circumstances.

VIII. LIMITATIONS

This proposal has several limitations. First, because it has not been implemented, it is not possible to state that the anticipated results will be achieved. Second, a minimum sample of 30 women entrepreneurs, selected voluntarily, will not allow the findings to be generalized to all MSEs in Santa Ana. Third, digital competence will be measured mainly through self-perception, which may differ from actual skills, although the analysis of digital profiles provides a contrasting source. Finally, virtual formats depend on connectivity: FUSADES (2023) reports that only about 40% of the firms surveyed have fixed broadband internet and that fewer than 70% have computers, so provision should be made for mobile phone use and in-person alternatives.

IX. FUTURE LINES OF WORK

It is recommended to incorporate a pre- and post-training evaluation to measure change in participants' digital competence, as well as business outcome indicators, such as social media reach or sales through digital channels, and medium-term follow-up. It would also be valuable to replicate the experience in other cities and to coordinate the program with the institutions that already support MSMEs, in line with the recommendation to coordinate training in order to broaden its reach and complementarity (FUSADES, 2023).

X. CONCLUSIONS

The proposal is a concrete response to the need to reduce the digital divide affecting women entrepreneurs in Santa Ana. The initial assessment will make it possible to identify critical areas and opportunities for improvement, while the training program, designed under the "learning by doing" methodology, will foster the acquisition of skills that can be applied immediately in their businesses. Creating a learning community and a mentoring system will encourage collaboration and the exchange of good practices, enhancing long-term impact. In short, optimizing the strategic use of ICTs can not only increase women entrepreneurs' individual competitiveness but also contribute to local economic development, promoting inclusion and equity in the business sphere.

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