

The development of soft skills as an enhancer of the professional effectiveness of graduates of the degree in business administration of the Tecnológico Nacional de México - Instituto Tecnológico de Morelia

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ABSTRACT

In the current field of technological higher education, soft skills have emerged as an essential component of professional training and a booster of the performance effectiveness of graduates from various programs in the labor market. This paper presents the historical conceptual evolution, as well as the management skills model proposed by Robert L. Katz, which distinguishes among technical, human, and conceptual skills and the various designations they have been given (soft skills, power skills, and socio-emotional skills). The analysis focuses on the impact that the systematic development of these skills will have on comprehensive training, through a structured implementation within the framework of humanism for social justice of TecNM and its New Educational Model, to generate graduates of the Bachelor's Degree in Administration from the Instituto Tecnológico de Morelia (ITM) who are more adaptable, collaborative, and socially responsible, with greater professional effectiveness and social contribution.

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Introducción

In the 21st century, educational, professional, and social paradigms have radically transformed to respond to new challenges that transcend the domain of technical skills alone. Soft skills have become increasingly relevant, serving as a differentiating factor in effectiveness and performance between competent professionals and exceptional leaders. Factors such as stock market and financial volatility, the instability of global economies, the accelerated migration of processes toward computerized automation, new work modalities, and the growing need for interdisciplinary collaboration have positioned the acquisition of these skills as an indispensable trait for achieving contemporary professional effectiveness.

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The New Educational Model of the National Technological Institute of Mexico (TecNM) recognizes this reality and has incorporated the systematic acquisition of soft skills as an essential component of its training program. This model, based on "Humanism for Social Justice," articulates these competencies with the principles of social relevance, equity, excellence, and continuous improvement, and integrates them based on the axes of inclusion, interdisciplinarity, social responsibility, innovation, and environmental awareness. This research analyzes the potential impact of soft skills development on graduates of the Bachelor's Degree in Administration from the Instituto Tecnológico de Morelia (ITM). By presenting the historical evolution of this concept, its theoretical foundation, and its practical application in the educational model proposed by TecNM, it is argued that the systematic integration of these competencies improves students' overall academic performance, their ethical leadership, and their ability to generate a positive organizational and social impact. As a result, their professional profile and employability are strengthened.

HISTORICAL BACKGROUND

Origins and initial research

The concept of soft skills emerged from research by the United States Department of Defense, specifically through the Con-Train (Contracting Training) program, developed between 1972 and 1975. Military researchers Paul G. Whitmore and J.P. Fry observed that, despite the excellent technical preparation of commanding officers, failures in leadership, communication, and decision-making under pressure accounted for up to 85% of operational mission failures. The 1972 Systems Engineering of Training study first established the distinction between hard skills (technical, measurable, and team-specific) and soft skills (related to human interactions, leadership, and communication).

Transition to the business world

The 1980s marked the transition of the concept of soft skills from the military to the business context, driven primarily by the structural changes that emerged in organizations during this period. Economist Daniel Bell had predicted in 1973, in *The Coming of Post-Industrial Society*, that intellectual work and services would require new competencies focused on human relations. For his part, Peter Drucker concluded in his work *Innovation and Entrepreneurship* that effective knowledge management required skills that transcended technical expertise. Research he conducted at General Electric, IBM, and other leading corporations revealed that the most successful executives shared several common competencies, namely persuasive communication, consensus-building, effective negotiation, and the ability to motivate diverse teams. Similarly, Warren Bennis and Burt Nanus, in their work, *Leaders: The Strategies for Taking Charge*, deepened our understanding of soft skills by conducting longitudinal studies with 90 successful organizational leaders. Their findings confirmed that transformational leadership depended on interpersonal skills, including effectively communicating a vision, building trust, managing change, and developing other leaders.

Emotional Intelligence Revolution

The 1990s represented a turning point, with the introduction of the concept of emotional intelligence. Salovey and Mayer initially defined this construct as "the ability to monitor one's own and others' emotions, discriminate between them, and use this information to guide thought and action" (p. 17). Goleman (1995), for his part, transformed the concept of Emotional Intelligence, providing empirical evidence that the emotional quotient (EQ) predicts professional success more accurately than the traditional intelligence quotient (IQ). His research, which included 181 executive positions in 121 organizations worldwide, demonstrated that emotional competencies, including self-regulation, empathy, and social skills, constituted 67% of the skills considered essential for effective leadership.

Gardner (1983) developed the theory of multiple intelligences. His work contributes to the understanding of human intelligence by highlighting the importance of interpersonal and intrapersonal skills and, through neurological studies, demonstrating that these constitute independent cognitive systems, as valid as logical-mathematical or linguistic intelligences.

Consolidation in the digital age

The automation of routine processes and the globalization of markets have generated a growing demand for eminently human skills such as creativity, empathy, intercultural negotiation, and leadership, particularly in virtual environments for managing work teams and making decisions. In 2001, Marc Prensky coined the term "digital natives" to identify a generation with developed technological skills but deficiencies in face-to-face interpersonal skills. Based on this observation, the need to balance the development of human skills with improvements in digital performance was established. The 2000 Learning a Living report, prepared by the United States Department of Labor, found that the fastest-growing occupations required a combination of technical and soft skills, officially establishing these competencies as a core element of workers' employability. This is consistent with Deming's (2017) and Lamri and Lubart (2023) perception, which points to the growing importance of soft skills in the labor market.

Era of the knowledge economy

Two major critical events highlighted the importance of soft skills, particularly ethical leadership, crisis communication, and building organizational trust. First, the 2008 global financial crisis and its aftermath revealed corporate scandals that demonstrated that technical competence, unguided by ethical leadership in decision-making, could have devastating consequences across all markets. The World Economic Forum (2020, 2023) established in its Future of Jobs Report that the Fourth Industrial Revolution requires professionals who possess hybrid skills, that is, a mastery of technological tools, complemented by eminently human skills such as critical thinking, creativity, emotional intelligence, and collaborative leadership. The second event was the COVID-19 pandemic, between 2020 and 2022. It immediately tested the adaptability of leaders and teams in organizations by requiring them to use virtual media for staff communication and coordination, demonstrate empathy amid uncertainty, and maintain organizational cohesion.

Latin America

In Latin American education, the incorporation of soft skills development in higher education occurred in response to pressures from globalized and more competitive labor markets. ECLAC (2020) even characterizes them as a must in changing environments. However, recognizing their importance and intrinsic value in vocational training and their impact on social development, international organizations such as UNESCO (2020) and the OECD (2018) have promoted their inclusion in curricula as an essential means of achieving sustainable development and social cohesion in member nations. In Mexico, the National Institute of Technology of Mexico has been a pioneer in integrating these skills into vocational training and has created the concept of "socio-technological competencies," which incorporates technical mastery with interpersonal and leadership skills. This holistic vision recognizes that technological innovation requires not only technical expertise, but also communication, collaboration, and social responsibility skills.

THEORETICAL FRAMEWORK

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The Katz Model and managerial competencies

Robert L. Katz (1974) proposed a three-category model for classifying managerial skills, namely, Technical Skills. This category encompasses highly specific skills generally acquired through formal education and practical experience. Next, Conceptual Skills encompass the ability to view the organization as an integrated system, identify and understand the interrelationships among its components, anticipate environmental changes, and develop long-term strategies. Finally, Human Skills encompass the ability to work effectively with people, both as a participant, team member, and manager, in various leadership positions. Human skills were characterized as essential at all levels of the organization, but particularly critical at mid- and senior levels, as described by Boyatzis (1982) and Robles (2012). In the case of the ITM Bachelor's Degree in Administration, Katz's model justifies the development of interpersonal and strategic competencies (in addition to technical and conceptual ones) to provide graduates with the heuristic training required by the current labor market, thereby improving their effectiveness and contributions in the administrative positions they hold.

TAXONOMY OF SOFT SKILLS

Terminological and conceptual evolution

The concept of soft skills also contrasts with hard skills, or technical skills. And although their use has become widespread internationally, some critics argue that the term "soft" may suggest lesser importance or relevance, when, in reality, the concept relates to how these skills are identified and measured. Similarly, other names have emerged to represent soft skills, for example, "Power Skills," which seek to reposition these competencies as powerful and transformative elements of leadership. This terminology reflects the growing recognition of their impact on organizational effectiveness and professional success. Matteson, Anderson, and Boyden (2023) also refer to them as personal or intangible skills. International organizations such as UNESCO (2017) and the OECD (2018) refer to them as Socio-Emotional Skills, emphasizing their emotional and social dimensions and highlighting their importance for personal well-being and social cohesion. In academia, they are also called transversal competencies due to their multidisciplinary applicability and transferability across diverse contexts.

TecNM educational model

The National Institute of Technology of Mexico (2024) has named them socio-technological competencies in their integration into the training framework and new educational model. This conceptualization recognizes that technological innovation is an inherently social process and requires the development of interpersonal skills for its effective implementation. Six specific skills are identified, namely: Effective communication, to convey complex technical ideas to diverse audiences; Collaborative work, to function and contribute effectively to multidisciplinary teams; Ethical leadership, to lead projects and teams based on solid moral principles; Critical thinking, to analyze information, evaluate alternative courses of action, and make informed decisions; Adaptability, to adjust strategies and tactics in changing environments and emerging technologies; and Social responsibility, to commit to enhancing the positive impact of professional activity on society and reducing its negative impact.

Socio-Technological Competencies: Innovative Conceptual Synthesis of the Model

The National Institute of Technology of Mexico has developed the concept of socio-technological competencies as an innovative synthesis that recognizes the interdependence between technical competencies and interpersonal skills within the framework of technological innovation. The proposed integrative model transcends the traditional dichotomy between hard and soft skills to address a challenge in contemporary professional practice. Consequently, this approach recognizes that technology is created by human teams that require effective collaboration and that innovation arises from the intersection of technical knowledge and social understanding. Therefore, successful technological implementation depends on both its environmental impact and the organizational changes it entails. Finally, the social impact of technology requires ethical and social responsibility considerations.

Structural Dimensions of Socio-Technological Competencies

The new educational model identifies six individual competencies whose mastery balances the development of required soft skills with traditionally taught technical skills. Technical communication competencies include effective communication with multiple audiences, as evidenced by the ability to convey complex technical information to diverse audiences with varying levels of expertise and from different disciplines. Next are interdisciplinary collaboration competencies, through which teams made up of professionals from diverse disciplines can be effectively integrated and operated. Collective innovation processes are facilitated by leveraging the richness of diverse collaborations within the team. Ethical-technological leadership competencies include the ability to create and direct technological projects, as well as to evaluate their social and environmental impact, thereby making these innovations more accessible and inclusive.

On the other hand, critical-technological thinking competencies involve analyzing emerging technologies from various dimensions, including technical feasibility, economic impact, ethical considerations of their implementation, and the technical, operational, and reputational risks associated with their use. To achieve this, it is necessary to develop applied systems thinking that enables the evaluation of new technologies as components of complex sociotechnical systems, taking into account network effects, the analysis of complex interactions, and the anticipation of unintended consequences arising from the implementation of technological innovations. Finally, technological adaptability competencies relate to continuous learning in technological environments through the creation of professional networks, staying up to date by exploring emerging trends and technologies, seeking opportunities for experimentation from a perspective of calculated risks, and quickly adapting tools to changing environments.

SOFT SKILL DEVELOPMENT IN THE ITM BACHELOR'S DEGREE IN MANAGEMENT

Curricular integration

This program adopts a comprehensive approach, aiming to develop soft skills that permeate the entire educational experience and are articulated through multiple components. First, specialized subjects are integrated into the curriculum that employ methodologies that prioritize practice over theory, such as Management Skills Development, Organizational Communication, Leadership and Teamwork, Business Negotiation, and Professional Ethics. Additionally, throughout their studies, students participate in multidisciplinary integrative projects that require active collaboration with students from different educational programs, thus fostering the development of communication skills and multidisciplinary teamwork. Similarly, the professional residency program aims to provide students with work in real organizational environments where they can apply and perfect their soft skills, under academic and professional supervision that provides feedback on their performance in both hard and soft skills. Finally, the new educational model integrates extracurricular activities, such as keynote lectures, personal development workshops, public speaking competitions, and social responsibility projects, to provide additional opportunities for acquiring soft skills.

Innovative Pedagogical Methodologies

The teaching methodologies proposed for the effective development of soft skills place greater emphasis on experiential learning than on traditional knowledge transfer. Thus, students are expected to face real organizational challenges that require not only technical knowledge but also communication, negotiation, and leadership skills for effective resolution, through Problem-Based Learning. Similarly, business simulations are useful; they are controlled environments that replicate complex organizational dynamics, allowing experimentation with different leadership and communication styles. Personalized support programs (coaching and mentoring) have also been included to help students identify their strengths and areas for improvement, particularly in interpersonal skills. Finally, using feedback systems, such as 360-degree assessments, recommendations for developing soft skills are included and discussed.

MEASURING THE EFFECTIVENESS OF THE NEW MODEL

Indicators of academic effectiveness

The systematic implementation of actions aimed at developing soft skills in the Bachelor's Degree in Business Administration at ITM requires measuring their effectiveness to implement corrective measures. The pillars of this measurement are, first, Comprehensive Academic Performance: Students who actively participate in developing soft skills obtain better grades in all subjects, whether technical or requiring presentations, teamwork, or project leadership. Particularly, they are better able to solve problems in changing environments, establish productive relationships, communicate ideas persuasively, and lead projects with vision and social responsibility. Second, an increase in student participation in voluntary academic activities, university competitions, and research projects is observed. This could indicate a greater level of commitment and motivation. Finally, assessments reveal consistent improvements in the ability to analyze, synthesize, and critically evaluate information. This results in the acquisition of fundamental skills for academic and professional success.

Employability and professional transition

The development of soft skills is associated with improved performance during internships and a positive impact on work teams, which can translate into greater employability. Graduates who have successfully developed these skills have an advantage in three areas. First, they experience shorter job placement times, with employability rates exceeding 90% within six months of graduation. They then experience faster career progression, gaining leadership positions more quickly. Finally, employers confirm that program graduates excel particularly in communication skills, teamwork, adaptability, and ethical leadership.

Social impact and civic responsibility

In this area, students and graduates have demonstrated a greater propensity to participate in community development initiatives, exercising leadership in civil society organizations and social responsibility projects. At the same time, they have participated in the development of socially focused business projects that address local and national issues, demonstrating the integration of technical skills with social commitment. Finally, the evaluations conducted confirm the effectiveness of the training approach in developing ethically sound and socially responsible professionals.

ARTICULATION IN THE NEW EDUCATIONAL MODEL OF TecNM

Model dimensions

The development of soft skills in the Bachelor's Degree in Administration at ITM is coherently articulated in the four dimensions of the New Educational Model of TecNM. In the Philosophical Dimension, comprehensive training based on humanism for social justice provides the value framework that guides the development of these skills toward social service and the construction of a more just and equitable society, founded on ethical principles. In the Academic Dimension, the integration of socio-technological competencies in the curricula and programs ensures that the development of soft skills is systematic, progressive, and consistent with the specific educational objectives of the Bachelor's Degree in Administration. In the Organizational Dimension, promoting an institutional culture that values collaboration, ethical leadership, and social innovation creates an enabling environment for students and faculty to naturally and consistently develop and practice soft skills. Finally, in the Connection Dimension, student interaction with the productive, social, and governmental sectors provides real-life contexts for the application and development of soft skills, ensuring their relevance and effectiveness.

Guiding principles

There are four principles in the TecNM educational model that provide the regulatory framework for the development of soft skills. According to the principle of Social Relevance, the soft skills developed respond to contemporary social needs, equipping professionals to generate a positive impact on the community. At the same time, in line with the principle of Equity, these

competencies are developed through an inclusive approach, ensuring that all students have access to comprehensive development opportunities. The third principle is Excellence, which establishes high standards for the development of soft skills in future professionals, using innovative pedagogical methodologies and rigorous evaluation systems. Finally, the principle of Continuous Improvement promotes the ongoing evaluation and updating of implemented actions through feedback from students, graduates, and employers, aiming to optimize their effectiveness.

Transverse axes

The model's development of soft skills is based on five cross-cutting themes. The first is inclusion, which means methodologies recognize and value student diversity and use pedagogical approaches that adapt to different learning styles and cultural profiles. The second is interdisciplinarity, which promotes interaction with students and professors from different disciplines, fostering a comprehensive view of contemporary challenges and promoting their solution through active collaboration. Third, the social responsibility axis fosters students' awareness as agents of social change. Likewise, according to the innovation axis, emerging methodologies and technologies are used to enhance the development of interpersonal and leadership skills. Finally, through environmental awareness and sensitization, the goal is to train professionals committed to sustainable development.

EVALUATION AND MONITORING METHODOLOGY

Measuring instruments

Evaluating soft skills development requires instruments that capture their multidimensional complexity. Heckman and Kautz (2012) highlighted the difficulty of obtaining concrete measurements of these types of skills. In this regard, they propose the use of evidence portfolios, through which students document their progress and include reflections, potential projects, feedback from peers and supervisors and structured self-assessments. Also useful are 360-degree evaluations. Simulations and Assessment Centers are another valuable tool. Finally, it is important to monitor graduates' professional performance and career trajectory, providing feedback on the effectiveness of the training program and its inclusion of soft skills.

Indicators

Three types of indicators are considered. First, academic indicators, represented by grades obtained in courses requiring collaborative work, increased participation in voluntary academic activities, and demonstrable development of oral and written communication skills. Second, indicators related to employability, including the time to job placement after graduation, the hierarchical level attained in the first job, and employer satisfaction with the graduate's performance. Third, social impact indicators include student participation in social responsibility projects, leadership in civil society organizations, and the development of social innovation initiatives.

CHALLENGES AND OPPORTUNITIES FOR IMPROVEMENT

Institutional challenges

The effective implementation of soft skills development faces several challenges. Given that the majority of the academic staff come from traditionally technical backgrounds, it is necessary to undertake teacher training that includes specialized instruction in methodologies for developing interpersonal skills. This includes eliminating the initial resistance of students and teachers toward pedagogical approaches that prioritize soft skills over technical knowledge. Finally, it will be necessary to implement objective, ongoing measurement of the effectiveness of soft skills development, which presents methodological complexities, the need for sophisticated instruments, and the requirement for trained personnel.

Opportunities for improvement

The aforementioned challenges can represent opportunities to develop appropriate solutions for effectively integrating soft skills into academic training and enhancing their effectiveness. Technological integration: Emerging technologies enable the development of simulation platforms, real-time feedback systems, and competency analysis tools. Likewise, inter-institutional collaboration networks can be established with other educational institutions and public and private organizations to multiply and enrich opportunities for practice in real-world settings. Finally, applied research on soft skills can generate lines of research, specialized knowledge, and best practices in the Mexican context.

Conclusions

Trends indicate that soft skills will continue to grow in importance as a requirement for responding to technological and social transformations, demanding constant adaptation of training methodologies and curricular content. Consequently, the training of professionals in administration requires a dynamic balance between technical and soft skills, integrated through innovative pedagogical approaches and aligned with principles of social justice and sustainability. Their strategic importance for effective leadership and organizational innovation has been recognized. This is found to be a critical factor for high performance and student effectiveness in the Bachelor's Degree in Administration at the Instituto Tecnológico de Morelia. Students are ethically sound and socially responsible, capable of leading the organizational and social transformation demanded by the present times. The systematic implementation of interpersonal, leadership, and socio-emotional competencies within the framework of TecNM's New Educational Model enables this integration across the philosophical, academic, organizational, and networking dimensions, ensuring training coherence and social relevance. At the same time, respect for the principles of equity, excellence, and continuous improvement, and the articulation of actions along the cross-cutting axes of inclusion, interdisciplinarity, and social responsibility, provide a framework that guides these competencies toward building a more just and sustainable society. The assessment of the impact of the actions undertaken to integrate soft skills into the curriculum, through various indicators, validates the institutional investment in the systematic development of interpersonal skills as an essential component of comprehensive training. Finally, the challenges identified (teacher training, resources, cultural resistance to change, and assessment complexity) as potential barriers are also a source of opportunity for improvement through the use of predominantly technological tools (virtual reality, artificial intelligence, and blockchain) to enhance the program's effectiveness.

Conflict of interest statement

The authors declare that they have no conflicts of interest related to this research. The study was conducted for academic purposes and did not receive external funding.

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