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Optimizing the Workplace Adaptation Process Through a Leadership Center for Engineering Students

Hector Andres Meraz Perez[1], Adrian Cardona Sanchez[2], Ricardo Rodriguez Figueroa[3], Roberto Ademar Rodriguez Diaz[4*], Isaac Hernandez Arrieta[5]

[1]*Master Degree Student, National Technological Institute of Mexico, TES de Coacalco, Mexico, Coacalco de Berriozabal, Mexico*
[2,3,4,5]*Professor, National Technological Institute of Mexico, TES de Coacalco, Mexico, Coacalco de Berriozabal, Mexico*

***Abstract*: This article proposes a management model for training students at the Technological Institute of Higher Studies of Coacalco (TESCo), focused on the development of leadership skills. The creation of the "Leadership Hawk Center" is justified as a response to the needs identified by employers, and the results of a pilot test applied to Industrial Engineering students are presented. Additionally, the conclusions and recommendations for optimizing the implementation of the model are analyzed. This work is complemented by research on reasonable adjustments in the work environment and their impact on the inclusion of people with disabilities, highlighting the importance of inclusive prevention.**

***Keywords*: leadership development, student training model, management model for training, educational administration, skills training, employer needs.**

1. Introduction

In response to growing demands of the job market, the Technological Institute of Higher Studies of Coacalco (TESCo) has implemented an innovative management model for student training, aiming to develop comprehensive leaders [1].

This model, spanning the entire academic program, equips students not only with solid technical knowledge but also with essential soft skills for professional success [2].

By fostering an active and experiential learning environment, TESCo seeks to cultivate leaders capable of adapting to changing environments and driving both personal and organizational growth. Through this integrated approach, TESCo positions itself as a higher education institution committed to training highly skilled professionals ready to meet the challenges of the 21st century [3].

The primary objective of the model is to develop a leadership training program that responds to the changing needs of the labor market, cultivating leaders capable of adapting to dynamic professional environments. Through the creation of the 'Leadership Hawk Center,' the aim is to assess, develop, and monitor the leadership competencies of students, equipping them with the necessary tools to contribute effectively to organizations [4].

The center is dedicated to training leaders who can face current challenges, make strategic decisions, and quickly adapt to changes in the labor market [5].

2. Methodology

The model is structured in multiple phases to develop effective leaders. Initially, a comprehensive psychological assessment is conducted to identify leadership aptitudes and the general health status of the participants [6].

Those who meet the criteria move on to a second phase where, using job simulators in the industrial engineering laboratory at TESCo, their ability to concentrate and make decisions under pressure is evaluated [7].

Throughout the program, a continuous training and progress monitoring process is implemented to ensure the development of the necessary leadership competencies to face the challenges of today's work environment [8].

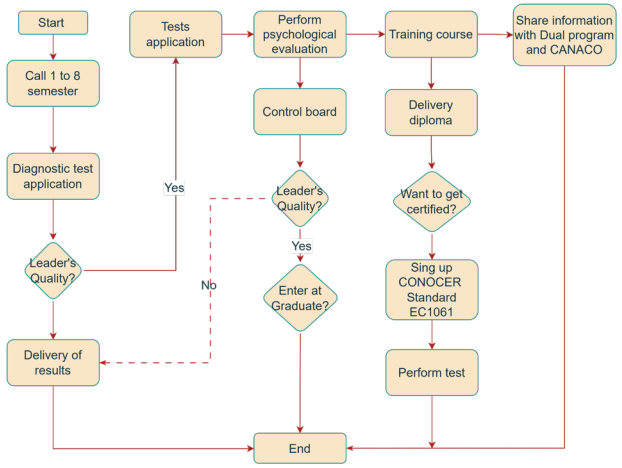

Fig. 1. Flow diagram of the leadership center

A. Justification

The implementation of the Leadership Hawk Center will benefit various stakeholders: [9]

*Corresponding author: ademar@tesco.edu.mx
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- TESCo: It will train students with a high level of commitment and sense of belonging, enhancing the institution's prestige.
- TESCo's Programs: They will develop integral leaders with strong business administration and socioemotional skills [10].
- Students: They will be trained as leaders who are agents of change, capable of positioning themselves in any company [11].
- Employers: They will have access to young leaders who can offer solutions and generate productivity.

B. *SWOT Analysis*

It was realized a SWOT Analysis to identify the next:

Strengths:

- CACEI (assuming this is a specific certification or accreditation)
- Ergonomics and work study courses
- English language proficiency
- Office software skills
- Conventional and CNC machine shop
- Welding workshop

Weaknesses:

- Lack of faculty with field experience
- Insufficient high school-level math skills
- Limited knowledge of the program
- Lack of training in specialized software (Matlab, Visio, SAP, Factory IO)
- Faculty resistance to change

Opportunities:

- Knowledge assessment exam
- CENEVAL (assuming this is a national standardized test in Mexico)
- CANACO as an exhibition showcase
- Academic agreement for direct transfer from technical high school.

Threats:

- Ergonomics and Logistics Laboratory at UPVM (a competing institution)
- Potential replication of the program

C. *Characteristics of Pilot Test*

A pilot test was conducted with three 8th-semester Industrial Engineering students. The evaluated parameters were:

Fig. 2. Students of pilot test

- Concentration
- Problem-solving ability
- Time management
- Stress management
- Instruction following
- Goal achievement
- Assertiveness
- Decision-making

Results demonstrated the test's effectiveness in identifying leadership aptitudes and areas for improvement in students.

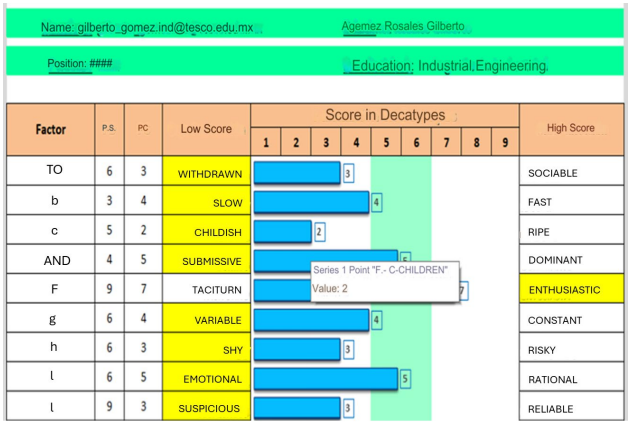

Fig. 3. Results of the psychology of decatypes for each student

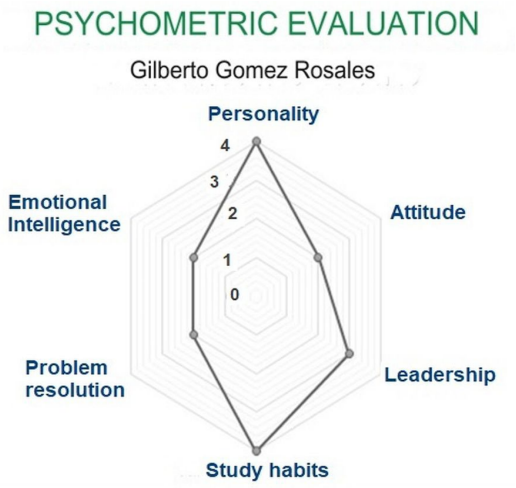

Fig. 4. Example of the results of the psychometric test

D. *Comparative Learning Curves*

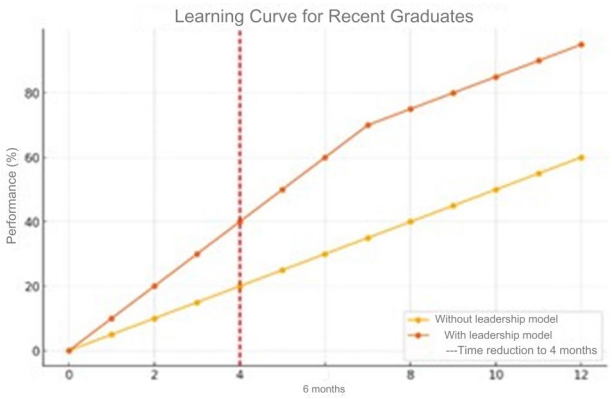

Fig. 5. Comparative learning curve graphic

The implementation of the leadership model aims to significantly reduce the adaptation time of graduates in the work environment, from 6-12 months to only 4 months, achieving a 60% performance in this period and up to 95% in 12 months. This acceleration in the learning curve offers multiple advantages for employers, as they have reliable personnel oriented towards the company's objectives from the beginning.

Fig. 6. Student performing the cube test, (2023)

Table 1
Comments and recommendation of the psychology test

Evaluator's comments	Recommendation
He is often chosen as a careful, experienced, worldly, challenging group leader or leader. He is stubborn and analytical. He is intellectually mannered and disinclined to find solutions to situations emotionally immature, weak to tolerate frustrations, evasive, fatigued nerves who easily gets angry with things and people, he is generally dissatisfied. He does not like to make decisions except together with other people. He likes the approval of others and society very much. He enjoys being admired. He is not a very resolute individual and is indecisive, excitable, restless, irritable, impatient. He often feels overly fatigued but can remain inactive. It does not have a group vision.	POSSIBLE

The experimental event with the three students inside the Industrial Engineering booth demonstrated the effectiveness of their performance as leaders. The implementation of the leadership model not only improves students' skills, but also reduces the time they adapt to the work environment, benefiting both graduates and employers.

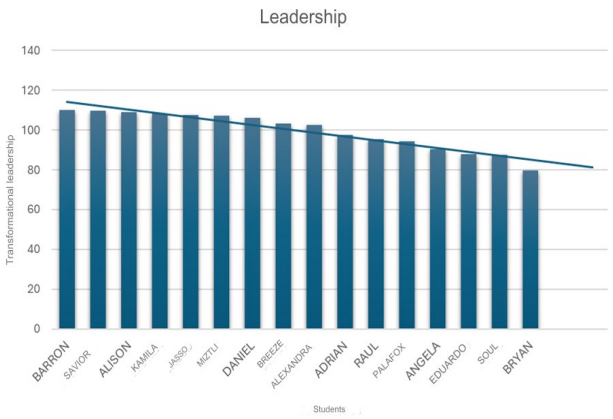

Fig. 7. Results of leadership test by group, Test 2

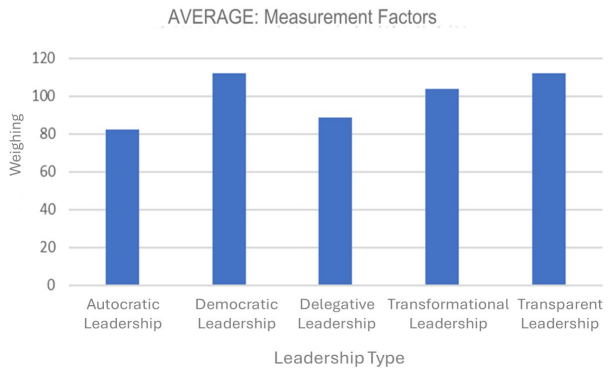

Fig. 8. Average results of leadership test by group Test 2

E. Comparison with Research on Reasonable Accommodations in the Workplace

The research titled "Reasonable Accommodations in the Workplace: An Approach to Inclusive Prevention" conducted by Arenas, Aldana Porras, Garzón Carrillo, and Lara Másmela (2022) in Ibagué, Colombia, provides an additional context to the model proposed in TESCo. The study addresses the employment inclusion of people with disabilities and its impact on the prevention of occupational risks. The findings of this study underscore the importance of reasonable accommodations and inclusive prevention, highlighting that these accommodations are essential to provide equal opportunities and improve the quality of work life for people with disabilities. [12]

F. Reasonable Accommodations and Inclusive Prevention

The study in Ibagué identified that reasonable accommodations are adaptations made by both workers and employers, primarily in large companies that follow national legislation. Additionally, a discrepancy was observed in the perception of risks between employers and employees. Employers focus on physical aspects, while employees perceive social risks in the work environment. Attitudinal and communication barriers were identified as the main risks.

G. Importance of Inclusive Prevention

Inclusive prevention should be considered as a socio-technical action that benefits all workers, regardless of their differential characteristics. The implementation of reasonable accommodations is essential for the effective inclusion of people with disabilities, improving their integration and performance in the work environment.

H. Recommendations for the Implementation of the Leadership Model in TESCo

Next are showing some recommendations to help the implementation of the model:

- Development of Continuing Education Programs: Include specific modules on leadership skills, time management, and stress management.

Table 2
Leadership training program

SEMESTER	HOURS	MODULE	ISSUE
3	20	1	Self Control and Impulse Management
3	20	2	Transformational Leadership
4	20	3	Effective communication
4	20	4	Teamwork and Conflict Management
5	20	5	Negotiation and decision making
5	20	6	Time Management and Optimization
6	DUAL SYSTEM		
7	20	7	Strategic Planning and Corporate Culture
7	20	8	Mentoring and Coaching
8	20	9	Technical and Professional Capabilities
8	20	10	Innovation and creativity

- Ongoing Monitoring and Evaluation: Implement continuous assessment systems to monitor student progress and adjust programs as needed.
- Fostering an Inclusive Culture: Promoting an organizational culture that values diversity and inclusion, following the principles of inclusive prevention highlighted in the study by Arenas et al. (2022). [12]
- Collaboration with Employers: Establish direct links with employers to understand their needs and adjust student training accordingly.

3. Conclusion

The TESCo operations management model for student training, centered on leadership development, offers a comprehensive approach to preparing graduates for the demands of the contemporary workforce. By incorporating inclusive prevention and reasonable accommodation strategies, the model not only enhances students' leadership capabilities but also fosters an inclusive organizational culture that benefits all stakeholders.

This holistic framework equips students with the necessary skills to address the challenges of today's business environment, ultimately contributing to the sustainable growth of organizations.

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