

Curricular dynamics at the Universidad Autónoma del Noreste. Development of soft competencies in students for employability*

Thematic core of the conference: Employability practices

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Abstract

Yturralde (2016) points out, that whether social or labor environments, demand to go beyond just recalling data, follow procedures to obtain a result, to have knowledge based on the time and discipline: he explains that to succeed today, you need to have well-developed soft competencies, or social skills, as Harvard University, Carnegie Foundation, and Standford Research Institute research exposed, on the importance of aptitude against social skills. They concluded that specialized technical knowledge generates 15% of success in professional and occupational activities, while 85% lies in the soft competencies, attitude, self-determination, the capacity of communication, teamwork, critical thinking, and conflict resolution primarily.

The Universidad Autónoma del Noreste (UANE), aware of the requirements of the moment and future ones, to develop in students strategic skills, hard and soft competencies required by society and the labor market, began in the year 2005 this longitudinal research with a mixed approach to determine an application methodology for the four teaching techniques (4TD) throughout the learning process of the student and a continuous improvement system through the analysis of results of each semi-annual cross-section.

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Application of the 4TD strengthens UANE's educational model, which focuses on the construction of learning for life and work. It encourages student's learning by relating the curricular objectives with problematic situations of the professional practice and also promoting constructive social interaction among members of work teams, through Problem-Based Learning (PBL), Project-Oriented Learning (POL), Case Method (CM) and Collaborative Learning (CL).

In the Students' Self-Evaluation of both semesters in 2018 and the first semester of 2019, students expressed that applying the 4TD strengthened their cognitive and social skills. All our university campuses are qualified above 8 in the 4TDscale, which implies strength. It is also an excellent indicator of the teaching performance on developing the students' abilities, which gives relevance to the project.

In 2018 the student satisfaction level of all UANE was 97% very satisfied with the application of the four teaching techniques, in general. In the 1st semester of 2019, students expressed 99% being very satisfied with the implementation of 4TD, the level of employability of our students is 70%.

This project benefits the teachers with continuous training in the 4TD application, strengthens their teaching practice, and has an impact on the formation commitment to students to cover all current requirements. The project is sustainable over time, given the interest of the UANE in academic quality that sustains the student formation according to our institution Mission of: "Create opportunities to develop exemplary people, committed to their future."

Keywords: soft competencies, active methods, four teaching techniques, students' satisfaction, implementation process

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Introduction

Nowadays, it is imperative to have soft competencies, since it has been proven that 15% of success in professional and work activities is generated by specialized technical knowledge, while 85% lies in soft competencies or social skills (Yturralde, 2016).

The Universidad Autónoma del Noreste, (UANE), being aware of these requirements, began this longitudinal research in 2005 to verify the development of students in hard and soft competencies through the application of active teaching methods throughout the student's educational

process, and to generate a continuous improvement process through the analysis of results of each semester cross-section.

Theoretical Framework

Villalobos and Melo (2009) argue that globalization requires that universities be the pillars of scientific, economic, cultural, and social progress, with the responsibility of training and preparing autonomous professionals, flexible in thinking and with the capacity to adapt to changing situations in a globalized society, which for Freire, M., Teijeiro, M. and Blazquez, F. (n.d.) implies training professionals with competencies related to versatility, personal skills, and high adaptability to change.

Internationalization, globalization, competitiveness and continuous innovations force organizations to require professionals with flexibility and adaptability to technological, market and organizational changes, as well as the ones in society values, therefore it is needed with multifunctional, global and comprehensive training (Tippelt and Lindemann, 2001).

Tippelt and Lindemann (2001) argue that educational institutions currently require enabling their teachers in the application of active methodologies for the learning teaching process that develop hard and soft competencies in students, according with the current labor and social requirements. In addition, active methodologies, are versatile and flexible to adapt to the continuous changes in professional needs.

The specialized technical knowledge required for job performance is called Hard Competencies, which, according to Yturralde (2016) are developed through academic education, training, and the exercise of the profession.

On the other hand, he explains that soft-skills, called soft competencies, Social Competencies, or People Skills, are intra-personal and inter-personal skills. They are positively-oriented attitudes towards social relationships, besides integrating critical and systemic thinking, ethics, adaptation to change, and resilience.

Yturralde (2016) points out that Nick HM van Dam in his work “The 4th Industrial Revolution & the Future of Jobs”, specifies the following ten skills to be required from 2020 onwards:

- solving complex problems;
- critical thinking;
- creativity;
- leadership / people management;
- teamwork / coordination with others;

- emotional intelligence;
- criterion and decision making;
- service orientation;
- negotiation skills;
- cognitive flexibility.

This relates to the approach that professional success at work depends on approximately 15% hard and 85% soft skills (Matus & Gutierrez, 2016 cited by Galván, 2016).

Farfan (n.d.) comments that, in 2014, the consulting firm Lee Hecht Harrison-DBM Peru published the study “Perceptual Gaps Between Employers and (University) Students on Entering the Labor Market in Peru”; where one of the critical findings was that, from the standpoint of companies, students do not have the soft competencies necessary for the position, thus becoming an obstacle to employability.

In Mexico, the OECD (2019) argues that according to their investigations about the employers' perception of the level of skills development in graduates, their findings state that every four out of five employers have trouble recruiting staff for their vacancies and Manpower Group (2017) considers that it is due to the following reasons: lack of experience, non-viable wage expectations, lack of technical preparation and professional skills.

Moreover, the 2014, Development Research Center (CIDAC) survey identified in higher education students, incompetences in written and oral communication in Spanish and English. Employers identified notable problems in graduates in information synthesis, logical reasoning, responsibility and proactivity.

In this CIDAC survey (2014) human resources managers at a national level, identified the following competencies as very important and lacking in interviewees: basic knowledge on equipment and machinery use, project management, negotiating capacity and conflict resolution.

Companies in Mexico assign significant value to soft competencies (7 out of ten manifest it).

From this perspective, he concludes that this problem is because the educational system does not consider the development of these competencies in its curricular structure, nor does the teaching methodology of teachers promote them in the teaching-learning process. He argues that it is imperative to develop “soft” competencies in university students through implementing creative teaching strategies.

Martínez, Cegarra y Rubio (2012) as noted by Matus y Gutiérrez (2016, quoted in Galván, 2016) consider that, in order to enable hard and soft competencies in higher education students, teachers need to be trained in active teaching methods to be facilitators in building knowledge and develop soft competencies, through the participation and involvement of students with learning activities in which they present problematic and complex scenarios to be solved as presented in the field of work, either through projects, case analysis, which promote to be autonomous, in collaboration with others, to discuss possible solutions to the problem being studied and to focus with critical thinking on the solution of the problem.

Likewise, the ILO (2014), raises the urgent need to find innovative ways of teaching to develop these skills in the training process and presents the following elements for consideration:

1. design of curricular programs whose construction and transformation occur through dialogue and joint work with employers to align training with business needs and current reality. Training teachers in active teaching techniques to solve real work situations. UANE belongs to the Board of the Universidad Empresa Association of the Confederation of Mexican Republic (COPARMEX) where the professional requirements of employers are obtained firsthand to ensure the relevance of the educational programs we offer;
2. applying active methods focused on learning to develop practical skills required in the real world in students. At UANE we have the 4TDs that respond to this requirement;
3. generating mentoring programs to link students with professionals who guide them over the world of work, explain them what it means to work in the formal sector and the opportunity to practice communication skills. The tutoring program is recently initiated at the University with the purpose of supporting students, through personalized accompaniment, throughout the student's formative path to follow academic performance, prevent school difficulties and guide him on work habits and study in a responsible manner;
4. applying interactive teaching with exercises that provide opportunities for experience, practice, consolidation, and reflection by the students;
5. creating relationships with companies to provide internships or professional practice to have work experience in a real work environment. At UANE we have PP as a requirement to graduate, supported by 174 agreements with companies to provide internships from January to June 2020;
6. simulating work environments in class; setting up companies and practice workshops.

Currently, there exist four active teaching techniques that promote the construction of knowledge, its practical application, the development of reflective, critical, and social skills:

Problem-Based Learning (PBL): Teaching technique integrated by a set of activities related to each other. It presents a problem to be solved related to professional practice. The problem is written using a scenario with little information, resembling what happens in a real job, to solve it the student must follow the technique's methodology (Lopes & Costa, 1996).

Case Analysis (CM): Teaching technique which presents a case in writing, which describes a difficult situation for a person, family, group, or company. Students work in small groups collaboratively to analyze, compare, and contrast possible solutions and make group decisions. The method focuses on the discussion of facts, through which participants examine, think, reflect, socialize, and apply knowledge when analyzing the information and making decisions to solve the case following the technique's methodology (Castro, n.d.).

Project Method (POL): Teaching technique which involves an interactive process between learning and the labor world, between the individual and the group. Throughout the entire process of the project, students continually reflect on their way of acting. This continual process of reflection differentiates the project method from the simple provision of a product. The final product is only one component of the project. The project is based on an idea to put it into practice. The project idea is investigated, commented, discussed, verified, decisions are made, and the implementation of the project idea is evaluated, always based on detailed and exact planning of the steps to follow. Its methodology develops research abilities, reflection, and discussion, through which the students build their knowledge, generating products or services according to the real needs of a client (Tippelt & Lindemann, 2001).

Collaborative Learning (AC): A teaching technique oriented to the development of interactive learning. It integrates students and involves them in common tasks, combining efforts, talents, and competencies, through activities and interactions aimed at achieving the goals established by consensus. Collaborative work develops the capacity to respect the individual opinions and contributions of group members, develops social skills, individual responsibility, and positive interdependence and negotiation capacity for better student performance in the professional field (Revelo-Sanchez, Collazos-Ordonez, & Jimenez-Toledo, 2017).

To carry out teaching with active methods, it is necessary to train the teacher in each of the techniques, to design and plan the subject's development according to the methodological guidelines of the teaching technique to be implemented in class. The result is stronger student's hard

theoretical knowledge skills and their practical application, such as soft competencies, which are a critical factor in employability.

Objectives

Overall Objective

To identify the level of satisfaction of undergraduate students in developing soft competencies through their participation in the teaching technique programmed in their training process for the school period of 2018 and the 1st semester of 2019 at the Universidad Autónoma del Noreste.

Specific Objectives

To identify the number of academic plans, subjects, and teachers with teaching techniques (TT) in 2018, first and second semester of Bachelor's degree at UANE level.

To specify the distribution of the application of the 4TDs in 2018, first and second semester of Bachelor's degree at UANE level.

To determine the number of students who participated in the evaluation of the 4TD in 2018, first and second semesters of Bachelor's degree at the UANE level, and verify their level of satisfaction in applying the teaching technique.

To identify the number of academic plans, subjects, and teachers with teaching techniques (TT) in 2019, first semester of Bachelor's degree at UANE level.

To determine the number of students who participated in the evaluation of the 4TD in 2019, first semester of Bachelor's degree at the UANE level, and verify the level of student satisfaction in applying the teaching technique.

To specify the distribution of the application of 4TDs in 2019, first semester of Bachelor's degree at UANE level.

To identify the levels of satisfaction in the students' self-evaluation in the development of skills developed by the 4TDs in 2018 and the 1st semester of 2019 of Bachelor's degree at the UANE level.

Context

UANE is a private institution of higher education, founded in 1974. It currently has more than 10,500 students, 42,000 graduates, and eight

campuses with high school, undergraduate, graduate, and online education programs.

This proposal for the application and research of 4 teaching techniques (4TD) in the training process originates to promote life skills and employability in undergraduate students, according to current requirements.

From 2006, the 4TD was linked to the curriculum, and from that moment the student must take 2 subjects with technique in each semester.

Method

Type of Investigation

It is a mixed, descriptive, longitudinal, applied, non-experimental investigation. This study only presents quantitative data analysis.

The study population comprises students attending each semester of every major degree. For this work, the analysis of the 1st and 2nd semester of 2018 and the 1st semester of 2019 are presented on levels of student satisfaction in self-evaluations and applying the teaching technique.

Procedure and Instruments to Collect Information

At the end of each module, students from all majors are invited to evaluate electronically the application of the teaching technique in which they participated. Three evaluation instruments are used however, in this study, we only consider two of them:

- Student Self-Evaluation Instrument;
- Student Satisfaction Instrument;
- Data processing and analysis.

The following Table 1 Types of analysis shows the instrument to be processed and the type of analysis to be performed.

Tab.1 - Types of Analyses. Source: 4TD-UANE Report, 2008

Instrument	Objective	Scale	Analysis Type
Student Self-Evaluation Instrument (SE) that applies the teaching technique: CL, CM, PBL, or POL.	To get to know the student's perception of the development of their skills at the end of the module.	Ordinal with values between 1 and 10, where 1 is the lowest score and 10 is the highest, divided into 4 levels for analysis:	Number of groups that evaluated the teacher in each of the instruments in a critical area, by period, campus, and teaching technique with comparative bar graph. Number of groups that, on average, evaluated any of the questions on the instruments in a critical area, by period, campus, and teaching technique. Percentage of groups that, on average, evaluated any of the questions on the instruments in a critical area, by period, campus, and teaching technique.
Student Satisfaction Instrument (SS) regarding the teacher's performance applies the teaching technique: CL, CM, PBL, or POL.	To detect and provide feedback to the teacher in behaviors that can be improved and that the technique demands.	Ordinal with values between 1 and 4, where 1 if they feel satisfied and 4 if they are dissatisfied with the teacher's performance, divided into three levels for analysis:	Number of groups that evaluated each of the questions of the instruments in a critical area, by period and teaching technique. Detecting opportunity areas by period of each of the questions on the instruments according to the number of groups that evaluated any of the questions in a critical area. Serial graphs of the averages of the evaluations carried out in the SE instrument by period and technique to review the teacher's evolution when applying the teaching technique.

Results

In Table 2 General data 2018, the number of academic programs, subjects and teachers with 4TD are presented, with the levels of satisfaction in the self-evaluation of students about the development of cognitive skills and soft competencies for their participation in the application of the Teaching

Technique programmed for their subject during the 1st and 2nd semester of Bachelor's degree at UANE level in 2018.

Tab. 2 - General Data 2018. Source: Authors' elaboration

UANE -2018	Academic Programs	Evaluated Subjects with TT	Teachers who applied TT	Average student's self- evaluation in developing cognitive skills and soft competencies developed by their participation in the corresponding TT.
	77	314	118	9

In the students' satisfaction self-evaluation regarding the development of their cognitive and soft skills thanks to their participation in the corresponding TT, the average of the two semesters is 9, which implies a very high level of satisfaction (Tab. 3).

Tab. 3 - Teaching Technique and Skills to Develop, presents the skills that each technique fosters

Skills to Promote with CL		Attitudes and Values to Promote with CL
Conflict resolution.	Commitment.	Respect for others.
To reason creatively.	Critical thinking.	Tolerance for diversity and plurality.
Decision-making.	Accepting commitments.	Loyalty towards decisions made.
Emotional tension management.	Listening.	Civility.
Trust.	Handling information technologies.	Justice.
Learning to negotiate.	Self-confidence.	Solidarity.
Empathy.	Self-regulation.	Fellowship.
		Friendship.
Skills to Promote with CM		Attitudes and Values to Promote with CM
Identifying and defining a problem.	Creativity when generating diverse solutions.	Becoming familiar with the information, taking an active role, self-motivation (self-confidence and trusting others), and responsibility.
Identifying information needs.	Oral expression: Presenting their position with arguments.	Following a code of conduct.
Analyzing information, discriminating, synthesizing.	Writing properly (coherent ideas, spelling, and writing).	Tolerance and respect towards different opinions.
Proposing solutions.	Identifying key learning points.	Listening carefully and analytically.
Critical thinking (supporting ideas).	Handling information technologies.	Proactive and purposeful attitude.
Discussing personal reflections.	Time management	
Fixing errors.	Social and interpersonal skills.	

Differentiate facts and opinions		Collaborative attitude (sharing their learning, ensuring the understanding of others, awareness that personal actions affect the rest of the team). Responsibility for one's own learning. Recognizing others' good ideas.
Skills to Promote with PBL		Attitudes and Values to Promote with PBL
Identifying a problematic situation. Defining a problem. Stating hypotheses. Planning activities to solve the problem Gathering information from different sources, discriminating information, selecting what is important.	Communicating, persuading with arguments. Proposing solutions, evaluating benefits and consequences. Handling information technologies. Communicating in writing through a report. Presenting solutions to the problem. Analyzing and synthesizing information.	Tolerance and respect towards different opinions. Listening carefully and analytically. Proactive and purposeful attitude. Collaborative attitude. Responsibility for one's own learning.
Skills to Promote with POL		Attitudes and Values to Promote with POL
Problem-solving. Learning complex ideas and skills in realistic settings. Discussing ideas. Designing plans and experiments. Collecting and analyzing data. Establishing conclusions. Communicating their ideas and discoveries to others. Managing information sources. Managing available resources, such as time and materials. "Learning to learn" (for example: taking notes, questioning, listening). Integrating concepts across different subject areas and concepts.	Metacognitive skills (for example self-direction, self-evaluation). Associating cognitive, social, emotional, and personal goals with real life. Skills for life: Conducting a meeting, making plans, using a budget. Technological skills: Using software, making measurements. Skills for cognitive processes: Decision making, critical thinking, problem-solving. Personal skills: Setting goals, organizing tasks, time management.	Social skills related to group work and negotiation and conflict management. Collaborative work. Own initiative. Persistence. Autonomy. Defending their position before others. Establishing a non-competitive and supportive climate for students. Involving peers who usually do not participate. Love for learning.

We can observe the distribution of the 314 4TD applications in 2018, during the 1st and 2nd semester of Bachelor's degrees at UANE level, in Table 4 Distribution of 4TD-2018.

Tab. 4 - Distribution of 4TD-2018. Source: Authors' elaboration

UANE- 2018	CL	CM	PBL	POL
	32%	21%	42%	5%

In this same period, 2,646 students participated in the evaluation of the 4TD. Table 5 Level of Student Satisfaction in 2018, presents the results of their level of satisfaction with the application of the technique.

Tab. 5 - Level of Student Satisfaction. Source: Own elaboration

Nivel de satisfacción de los alumnos de licenciatura del 1° y 2° semestre-2018 a nivel sistema UANE. 2646 evaluaciones de alumnos participantes en 4TD.

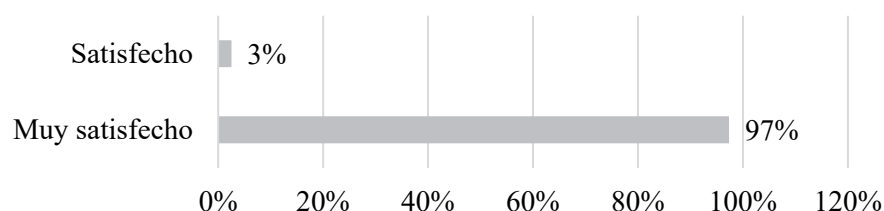


Table 6 General Data 1st semester-2019, presents the number of academic programs, subjects, and teachers with the 4TDs, as well as the levels of satisfaction in the student self-evaluation about the development of cognitive skills and soft competencies because of their participation in the application of the teaching technique programmed for their subject corresponding to the school period of the 1st semester 2019.

Tab. 6 - General Data. 1st semester-2019. Source: Authors' elaboration

EJ-2019	Academic Programs	Evaluated Subjects with TT	Teachers who applied TT	Average student self-evaluation in the development of cognitive skills and soft competencies developed because of their participation in the corresponding TT.
	29	103	34	9

The average self-evaluation of students on developing their cognitive skills and soft competencies with the TD corresponding to the 1st semester 2019 is 9.

Table 7 Distribution of 4TD, 1st semester 2019, shows the distribution of the 103 4TD applications in the 1st semester of 2019 in Bachelor's degree at UANE level.

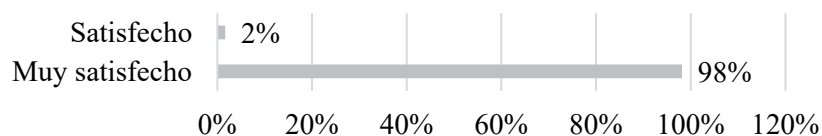
Tab. 7 - Distribution of 4TD, 1st semester 2019. Source: Authors' elaboration

EJ-2019	CL	CM	PBL	POL
	34%	17%	45%	5%

One thousand four hundred fifteen (1,415) students participated in the evaluation of the 4TD applied in the 1st semester-2019. Table 8 Level of Student Satisfaction in the 1st Semester 2019, presents the results of their evaluation in terms of their level of satisfaction with the application of the teaching technique.

Tab. 8 - Level of Student Satisfaction in the 1st Semester of 2019. Source: Authors' elaboration

Nivel de satisfacción de los alumnos de licenciatura del
1° semestre-2019 a nivel sistema UANE.
1415 evaluaciones de alumnos participantes en 4TD



Conclusions

The academic model of the UANE is distinguished by the intensive modular system that consists of taking 3 subjects every 6 weeks, which promotes the concentration of the student in that intensive academic burden in addition to working under pressure and stress which enables him for job insertion. On the other hand, the academic model integrates the pedagogical model, which highlights the application of 4TD in the training of students.

To determine the application of 4TD in the training of students, the UANE analyzed: its contribution to the fulfillment of the institutional

mission and vision and the educational model, the institutional budgetary capacity and human resources to continuously train teachers in the methodology of each of the teaching techniques, having an incentive for teachers who apply the technique and meet the established criteria, developing the corresponding electronic evaluation software to generate biannual information that would allow identifying opportunity areas thus maintaining a process of continuous improvement.

4TD Impact: from 2006, 4TD are linked to the curriculum, therefore, key subjects are selected, for each college career, to apply 2TD per semester. The population of students benefited at the undergraduate level with the application of 4TD, is of all graduates since 2006 to date, in addition to the students who are currently in training at the university.

Applicability and Sustainability: This project is fully applicable and sustainable at the Universidad Autónoma del Noreste, due to its integration at the curricular level and the academic model; the full interest and institutional commitment to achieve the integral development of the students, through the application of 4TD; having continuous information to assess progress in their training and development of soft and hard skills that promote employability, which is verified through the Student Satisfaction Survey, in which they express their feelings about the changes they perceive in their relational and cognitive structure through experiencing the application of each of the 4TDs, according to the subject and semester they attend.

Possibilities of replicating: It is advisable to consider the time required for 4TD teacher training, peer monitoring and observation. As well as the budget for implementation considering the economic incentive once they meet all the requested criteria.

They can be replicated in any educational context, based on teacher training and according to each educational institution's guidelines and requirements.

In the student self-evaluation in 2018 and the 1st semester of 2019, they express that they feel that their skills, both cognitive and social are strengthened, rating their development with an average of 9. This implies that it is an excellent strength and a very good indicator of the performance of the teacher who fosters the development of student skills, all of which gives relevance to the project.

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