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Artículos Científicos

El aprendizaje orientado en proyectos para el desarrollo de habilidades blandas en el nivel medio superior del IPN

Project-Based Learning for the Development of Soft Skills in the Upper Secondary Level of the Instituto Politécnico Nacional

Aprendizagem orientada a projetos para o desenvolvimento de habilidades sociais no nível médio superior do IPN

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Resumen

El objetivo de esta investigación fue desarrollar en estudiantes de nivel medio superior del Instituto Politécnico Nacional (IPN) habilidades blandas mediante la implementación de la metodología del aprendizaje orientado en proyectos. El tipo de estudio que se empleó fue una metodología cuantitativa con un alcance descriptivo. El instrumento que se utilizó para obtener la información fue un cuestionario basado en una escala Likert. La muestra del estudio estuvo constituida por el alumnado inscrito en el Centro de Estudios Científicos y Tecnológicos perteneciente al IPN. La distribución de la muestra con respecto al género fue de 67 % de

hombres y 33 % mujeres. Los principales resultados fueron que los participantes reconocieron un desarrollo muy frecuente de sus habilidades blandas en cuatro rubros: interpersonales, toma de decisiones, pensamiento crítico y autocontrol, y habilidades comunicativas.

Palabras clave: aprendizaje basado en proyectos, educación media superior, estudiantado, habilidades blandas.

Abstract

The objective of this research was to develop soft skills in students through the implementation of the project-based learning methodology at the upper secondary level of the Instituto Politécnico Nacional (IPN). It was used a quantitative methodology with a descriptive scope. The instrument that was used to obtain the information was a questionnaire based on a Likert scale. The sample of the study was constituted by the students enrolled in the Centro de Estudios Científicos y Tecnológicos belonging to the IPN. The sample distribution with respect to gender was 67% of men and the remaining 33% of women. The main results were that the participants recognized a very frequent development of their soft skills in the following categories: interpersonal, decision making, critical thinking and self-control, and communication skills.

Keywords: project-based learning, upper secondary education, student body, soft skills.

Resumo

O objetivo desta pesquisa foi desenvolver habilidades sociais em estudantes do nível médio superior do Instituto Politécnico Nacional (IPN), implementando a metodologia de aprendizagem orientada a projetos. O tipo de estudo utilizado foi uma metodologia quantitativa, com escopo descritivo. O instrumento utilizado para obter as informações foi um questionário baseado na escala Likert. A amostra do estudo foi composta pelos alunos matriculados no Centro de Estudos Científicos e Tecnológicos pertencentes ao IPN. A distribuição da amostra em relação ao gênero foi de 67% homens e 33% mulheres. Os principais resultados foram que os participantes reconheceram um desenvolvimento muito frequente de suas habilidades sociais em quatro áreas: interpessoal, tomada de decisão, pensamento crítico e autocontrole e habilidades de comunicação.

Palavras-chave: aprendizagem baseada em projetos, ensino médio, estudantes, habilidades sociais.

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Introduction

Taking into account that education has a fundamental role in the development of a society, educational systems need to consider their needs and demands, as well as the interests of the city.

Adanos and the goals that as a country are intended to be achieved. Currently, teachers face the challenge of training people who are going to work in a society characterized by uncertainty, innovation and the circulation of information from the use of technological tools, so it is necessary that new generations learn to live and function in this context (Bauman, 2008).

In that regard, the Organization for Economic Cooperation and Development [OECD] (2017) established the following:

> In the 21st century, competencies, skills and abilities have become the key factor in achieving the individual well-being and economic success of a society. Without adequate investment in these areas, the population languishes outside society, technological progress is not transformed into growth and countries are unable to compete in a world economy that is increasingly based on knowledge (p. 1).

In this way, education has responded to the changing requirements of society and industry. This represents both the institutions and the teaching staff the commitment to keep up to enrich the integral education of the students and train graduates who, in addition to having a disciplinary training, are creative, innovative and proactive. Under this perspective, it is necessary to understand, develop and implement didactic strategies in the classroom with the intention of carrying out learning experiences that strengthen and develop skills, abilities and attitudes for research, collaborative work, the use of the technologies of the information and communication (ICT), which allow the generation of proposals for solutions to problems of both personal and work life.

So it is not surprising the growing influence of ICT at all levels of the education system. In this regard, Marcovitch (2002) mentions: “In the face of the technological revolution, higher education institutions (HEIs) behave like any other organization that cannot ignore and stop taking advantage of its benefits” (p. 87).

In the World Economic Forum [WEF] (2017), several disruptive technological changes that are transforming social relationships between humans and objects were identified. Thus, there has been the widespread use of the Internet, the absolute use of mobile devices both at a personal and organizational level, the population census through big data, the collection of taxes

through blockchain, as well as incorporating artificial intelligence into the Board meetings This set of changes has been named the fourth industrial revolution. This revolution is characterized by the use of new exponential technologies such as advanced robotics, autonomous transport, artificial intelligence, data collection sensors, the Internet of objects, 3D printing manufacturing, nanotechnology or quantum computing (Coleman, January 23, 2016).

According to Escudero (2018), the first industrial revolution emerged at the end of the 18th century in the United Kingdom, with the emergence of steam energy, mechanization of agriculture, manufacturing and transport (Daemmrich, 2017). The second industrial revolution was consolidated in the United States of America at the beginning of the 20th century, where the disruptive technology was electric energy, which allowed mass production (Hintz, 2011; MacLeod, 2016). The third industrial revolution was triggered since the middle of the last century with the invention of semiconductors, digital platforms and the rise of personal computers (Hermann, Pentek and Otto, 2016). Unlike the previous three revolutions, the fourth is not defined by the emergence of a specific disruptive technology, but by the convergence of various digital, physical and biological technologies, such as artificial intelligence, augmented intelligence, robotics, 3D printing , cloud computing, big data, the Internet of things or nanotechnology (Rose, 2016).

In this way, the industrial revolutions implemented equipment, tools, materials and resources of various kinds, from steam engines and electric power to electronics and computer science, which has resulted in industries, first, mechanized productions and , later, automated. And obviously the impact was not only in the labor or industrial field but in everyday life.

Particularly, what characterizes the fourth industrial revolution are the forms of production based on the use of cybernetic physical systems to create a more flexible and reconfigurable industry, that is, that the structure of a factory can be modified to produce different products from the use of big data and data analysis, autonomous robots, computer process simulation, integration systems, Internet of things applied to industry, cybersecurity, cloud storage, 3D printing or manufacturing additive and augmented reality (Chapel, October 3, 2017). Likewise, Joyanes (2018) and WEF (2017) identified the incorporation into society of the use of various emerging technologies such as nanomaterials, robotics, biotechnologies, intelligent electricity networks, cryptographic systems, cybersecurity, among others. mentioned above.

The above implies a high investment in technology, and by extension it also implies the development of staff competencies, since workers must acquire a new set of capabilities related

to data management and analysis, computer-assisted production, online simulation , programming, predictive maintenance and the like (Ynzunza, 2017).

It is worth mentioning that having knowledge about technological advances in the industry results in greater clarity about the implications, benefits and challenges in other areas that will mark everyday life: ways of living, communicating, jobs, business. In the WEF report (2016), whose title translated into Spanish is The future of works. Jobs, skills and workforce strategies for the fourth industrial revolution, among other contributions it is stated that business models will have a high impact on jobs; challenge that requires proactive adaptation by industries, governments and institutions, because jobs will undergo a fundamental transformation into categories and occupations, the skills required by them will change: skills that improve productivity and free them from routine work will be demanded , which results in reinventing the functions of human resources: skills development, talent management, performance of multifunctional roles. While for some it is worrying about the loss of jobs, for others it is an area of opportunity, a fertile ground for new jobs.

Given this scenario, a transformation of educational systems is necessary: a learning environment is required that promotes the development of skills as the foundation of training, whose approach allows the individual to solve a complex situation from solution strategies that generate skills, skills and attitudes (Pavié, 2011).

Theoretical foundation

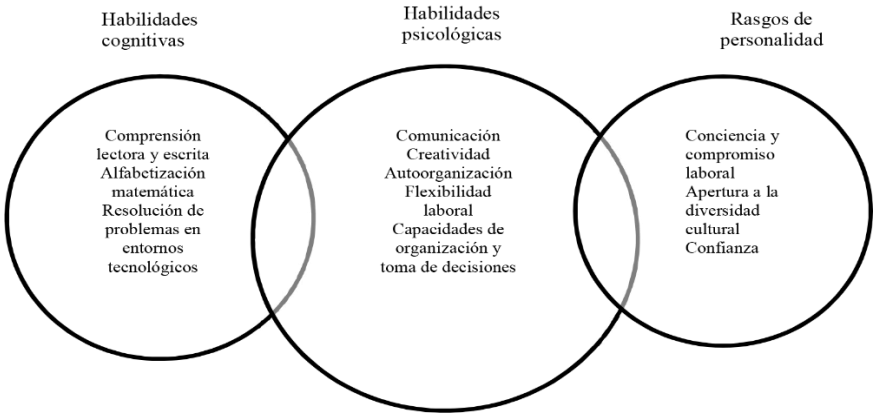
The OECD (2012) defines competencies as the set of knowledge, skills and abilities that can be learned; set that allows individuals to perform an activity or task adequately and systematically, and that can be acquired and expanded through learning. This definition includes the full range of cognitive skills, such as literacy and arithmetic; techniques that are specific to a sector or occupation, and socio-emotional, related to teamwork and communication. Therefore, all the competencies available for the economy at any given time make up the human capital of a country.

Meanwhile, the United Nations Educational, Scientific and Cultural Organization [Unesco] (2015) has proposed establishing school-industry or school-business linking programs with the objective of developing flexible competencies necessary to the changing reality of the world labor, and which are also known as transferable or non-cognitive. These capabilities are communication, digital literacy, problem solving, teamwork and entrepreneurship.

Therefore, in the short term, graduates will be needed in different areas, mainly digital. According to the Secretariat of Industrial Strategies of Madrid (2017), cross-cutting competencies should also be included, such as teamwork, adaptability and entrepreneurship, or good oral and public expression. We must not forget that the educational system does not have the sole purpose of feeding the labor market with what it demands at all times, but that it has to produce critical, educated and intelligent citizens, with integral formations in their specialties.

In addition to what has already been said, the OECD (2017) has established that the main competences for job performance form a continuum, from skills that are mostly cognitive to skills mostly linked to personality traits, with attitudes as shown in Figure 1

Figura 1. Competencias relevantes



Fuente: OECD (2017)

As the WEF (2018) points out: the relevant skills to be developed in people for the 21st century from basic education to higher education are the resolution of complex problems, critical thinking, creativity, collaboration and digital literacy, which are fundamental to allow people to remain flexible and adaptable to the changing needs of society. Specifically, in this forum recommendations were made regarding the development of labor skills for the fourth industrial revolution that will be transcendental for the immediate future, according to its projection for 2020. These are the following: 1) Creativity; 2) People management; 3) Coordination with others; 4) Emotional intelligence; 5) Judgment and decision making; 6) Service orientation; 7) Negotiation and 8) Cognitive flexibility (WEF, 2018).

Unesco (2018) also established the need to integrate the educational modality called dual (which combines teaching in the work space in a structural way) and whose approach is integral because it not only generates technical knowledge, but also “soft skills ”(Emotional

intelligence, self-control, teamwork, perseverance and leadership) to ensure that those young people who get a job manage to keep it.

Therefore, soft skills, also known as soft skills, are considered as a relevant component in both transverse and labor training due to the high level of interrelation established through social networks and other technologies, which make the environment a constant exchange of data, information, communication and knowledge (Ortega, 2016). In this way, professionals who have a high integration of white skills and technical competencies will have a lower risk of being replaced by automatic processes that have interaction limitations (David, 2015; Frey y Osborne, 2017).

For its part, Murti (2014) indicates that soft skills have been determined as necessary in the work environment because they are transversal, because they are related to the personality, attitude and behavior of each person. Thus, a graduate's profile must be prepared for lifelong learning and must also have good communication and a high capacity for teamwork, since, once again, technical skills are not enough (Mafflioli and Giuliano, 2003).

Similarly, in the study conducted by Dahm, Farrell and Ramachandran (2015) it was determined that those professionals who have greater communication skills are perceived with greater technical capacity, which is manifested in the ease of finding employment. While in the investigation carried out by Deming (2015) it was found that the demand in the global soft skills labor market has grown 24% because, following this same source, it has been recognized as essential that the technical skills be integrated with the soft ones, with a multidisciplinary work approach. Also, Robles (2012) established that oral and written communication skills, combined with teamwork, have a high correlation with professional success.

In the case of Mexico, the levels of upper secondary education are relatively low. The enrollment rate of students aged 15 to 19 decreases to 54%, which places it in the last position of the OECD countries and below the average of the organization, which is 84%. Likewise, only 16% of adults aged 25 to 64 have studied at a higher rate: the lowest proportion of OECD countries. Therefore, Mexico tends to specialize in activities with low added value, which generates informal, low quality and remunerative employment. To counteract this situation, it is necessary to provide opportunities for students of the upper middle levels to develop relevant skills. This will allow laying the foundations to build a more equitable society and increase the country's productivity levels.

In this sense, it is necessary to develop solid basic competences that allow individuals to enter the labor market or move to higher education: and to achieve this the previous level is

undoubtedly constituted in a cornerstone. Thus, graduates will have better skills and greater productivity, which increases the chances of finding work in the formal economy and obtaining higher salaries. A population with higher levels of education fosters economic prosperity and better living standards (OECD, 2017).

To achieve the development of soft skills, authors such as Dole, Bloom and Kowalske (2016), Freeman et al. (2014), like Al-Balushi and Al-Amri (2014), established the need to employ an innovative teaching approach in the development of the teaching-learning process aimed at allowing students to investigate from their previous knowledge in a collaborative environment . In addition, in the process of formation of competences the contents to be developed in the students are important, but it is also essential the methodological action that is carried out, that is, the way of addressing them by the teaching staff (Blanco, Jové and Reverter , 2012).

Thus, they have begun to use active teaching methodologies in order to achieve a greater participation of students in their learning, which are oriented to provide greater prominence on the part of the student from doing, inquiring and interacting using ICT (Konopka , Adaime and Mosele, 2015). In that sense, active methodologies are the set of activities and strategies used by teachers to achieve greater student participation in the construction of their learning. And among this type of pedagogical approaches, project-oriented learning (AOP), problem-based learning (ABP), gamification and the inverted classroom stand out (Roig and Álvarez, 2019).

Regarding the AOP, which we will focus on in this article, it offers an alternative that favors the treatment of the contents with the environment and interests of the student (Merrit, Lee, Rillero and Kinach, 2017; Rosa and Martínez, 2016). Markham, Larner and Ravitz (2003) and Blanchard and Dolores (2016) define that AOP is a systematic teaching method that involves students in the acquisition of knowledge and skills through an extended process of inquiry, structured around questions for the elaboration of a certain product, so, by articulating theory and practice, it generates significant knowledge. For its part, Vergara (2015) conceptualizes it as a learning process based on research, the principles of egalitarian negotiation, individual responsibility, the attitude of cooperation and consensual decision-making.

In this sense, the AOP is considered as one of the main didactic strategies that allows the development of various competencies, such as creativity, problem solving, ability to investigate, work collaboratively, motivation and use of social networks that leave to strengthen the educational systems of the 21st century (Austin, Abella, Delgado and Hortigüela, 2016;

Landron, Agreda and Colmenero, 2018). Consequently, for the implementation of the AOP at present, an organization of spaces, materials and resources is essential, as well as the inclusion of ICTs for an effective impact on the development of student competencies (Cascales and Carrillo, 2018) .

Other researchers who have dealt with this methodology have been Willard and Duffrin (2003) and Carrasco, Donoso, Duarte, Hernández and López (2015), who established that it is effective for the development of skills in solving real-life situations which also involve the use of attitudes and values that favor the ability to learn throughout life. Thus, this methodology allows the acquisition of knowledge, oral and written communication, critical thinking, teamwork, planning and time management, together with individual and group responsibility (De Miguel, 2006; Álvarez, Herrejón, Morelos and Rubio, 2010).

According to Thomas (2010) and Vergara (2015), the characteristics of the AOP are the following: part of situations related to the future profession of the students; the planning of activities to produce a product; responds to the interests and needs of the students; the result or product is valuable and useful; Students develop specific actions autonomously by articulating theory and practice; The activities of the different phases of the project are decided and executed by the students themselves, and teamwork is encouraged, so that learning is holistic and comprehensive. While the guidelines of the AOP are the following: teaching takes place in the context of a situation; the key contents are learned from the context and the action, together with the fact that it starts with a purpose shared by the students (Doménech-Casal, 2018).

In order to carry out the AOP it is necessary that the students work autonomously in the realization of a real project during a certain period of time, where the planning, design and the realization of a series of activities is required in which it is It is necessary to apply various skills, attitudes, as well as effectively use the resources available through reflection, debate, communication to collect and analyze information and generate their own resolution strategies (Mettas and Constantinou, 2007). In this way, a project addresses reality for students to analyze, use it as a learning tool, intervene in it, so its relevance generates educational experiences that cause personal and group change (Vergara, 2016).

Therefore, the benefits it has are the following: it links knowing knowing with knowing how to do; It enables the promotion of situation resolution, communication and autonomy skills; encourages lifelong learning, social responsibility and personal success; generates proactive communication and collaborative relationships; consider the needs of students with their styles, and motivate apathetic students (Markham et al. 2003). In this sense, the AOP allows

establishing the conditions that lead to an active, contextualized, integrated and understanding-oriented learning, which provides opportunities to reflect on the experience and apply what has been learned from a situation to be faced (Alonso, 2018). As you can see, the AOP emphasizes the role of the student in their learning process, interpersonal communication, inventiveness, formulation and resolution of situations, the search for information continues in order to understand their reality (Rodríguez, Vitvitskaya and Silva , 2018). Based on the above, it has been investigated as a proposal that enables the improvement of conventional learning.

In sum, the purpose of the AOP is to generate greater motivation both in disciplinary issues and in the development of skills, because the generation of a successful project requires students to use their communication, teamwork, management skills. time and leadership (Davcev, Stojkoska, Kalajdziski y Trivodaliev, 2016).

In this way, it integrates with greater impact the different theoretical and practical topics, so that the student implements what has been learned in the creation and development of a project, thanks to which, in turn, intrinsic motivation is promoted and the creativity (Hernando, Galán, Navarro and Rodríguez, 2011; Neebel, Merkel and Wong, 2013). Likewise, the AOP generates in the students the search, analysis and integration of the information in order to elaborate an appropriate evidence with the project, so that oral and written competence becomes a process of appropriation and transcendental management as a discursive practice. in which the way of thinking of a particular disciplinary area is disseminated and manifested (Álvarez and Boillos, 2015).

However, specific studies on the various subjects and educational levels are required to determine the effects of the AOP on the academic performance of students (Landron *et al.*, 2018).

Previous literature

In the study by Palazuelos, San-Martín, Montoya and Fernández (2018), it was demonstrated that the AOP is an active methodology for the formation of competences, since it encourages greater participation, autonomous work and the role of students. These authors concluded that it is a useful proposal for the development of a set of relevant knowledge, skills, attitudes and values related to creativity, motivation and academic performance in a collaborative work environment.

In that same tonic, Rodríguez et al. (2018) determined that the AOP significantly influences the development of research skills in the student body in terms of comprehensive reading, writing, mastery of mathematical calculations and the management of ICT. In the same way, they identified in the students interest and motivation to carry out the activities of the project and an active and timely participation.

In the Sánchez study (2018), it was found that 70% of the students positively valued working as a team from the AOP, coupled with the improvement of their academic performance. They also recognized in 67% the use of ICT as an important tool to be used with the AOP. In addition, 77% expressed significant learning promoted by teamwork based on a project. They also indicated that the product made from this method was interesting in its formation in 95%, added that 82% developed oral and written communication.

In the research of Landron et al. (2018) and Toledo and Sánchez (2018) it was determined that the AOP positively influences the use of content, motivation and willingness to work collaboratively on students. And for these reasons they concluded that it is a methodology that allows greater academic performance. In the same way, they established that the competences developed were critical thinking, creativity, self-learning, responsibility and collaboration.

Similarly, Alonso (2018) found that the AOP, from the students' perception, allows linking the practice with the contents of a subject. In addition, it was recognized as useful for developing competencies and identifying their future performance in the workplace. Their main findings were that 88% of the students expressed their satisfaction about the use of AOP in their training, as well as that 70% indicated a positive impact on their learning.

González, Ferreira and Barranco (2018), meanwhile, concluded that the AOP allowed students to develop soft skills: oral and written communication, teamwork and analysis, argumentation and systematization of information to produce the product. In addition, the total of the participants indicated that they achieved more in the subject than initially expected: the use of the project associated with a problem generated a greater interest and responsibility.

The research carried out by Alvarado, Galindo and Retamal (2018) stands out for the fact that 69.6% of the participating students contextualized and based their project with documents available on the Internet; The total number of participants prepared the project report; 96% developed oral and written communication, and 85% positively assessed the use of AOP in their academic training because it allowed the integration of knowledge, the use of computer resources, critical thinking.

Finally, Rico, Garay and Ruiz (2018) concluded that the implementation of the AOP positively influenced the training of students in terms of their level of knowledge and research skills, coupled with the development of analysis and synthesis skills. It also generated a team work that allowed sharing the challenges and achievements with their peers, as well as the insertion of ICTs to solve the situation and their relevance in learning was recognized.

The purpose of the study

Develop soft skills in students of the upper middle level of the National Polytechnic Institute (IPN) through the implementation of the AOP methodology.

Method

Type of study

The type of study that was used was a quantitative methodology with a descriptive scope because it was oriented to determine the levels of development of soft skills in the students of upper secondary education of the IPN (Namakforoosh, 2011).

To develop soft skills, the AOP strategy was implemented in the learning unit of Oral and Written Expression I, which belongs to the first semester of high school. These skills were grouped into a series of categories (see table 1).

Tabla 1. Habilidades blandas del estudio

Habilidades interpersonales	**Habilidades de toma de decisión y pensamiento crítico**	**Habilidades de autocontrol y afrontamiento**	**Habilidades comunicativas**
Comunicación interpersonal	Resolución de problemas	Aumentar la confianza personal	Escuchar
Negociación	Toma de decisiones	Responsabilidad	Leer

Trabajo en equipo	Investigación documental	Fijarse objetivos y metas	Expresión oral
Desarrollo de la creatividad	Liderazgo		Expresión escrita

Fuente: Leyva (2018)

Description of the educational situation based on the AOP

The educational situation was implemented with the students of first semester of high school, focusing on the development of an investigation of a real phenomenon such as migration, which culminated in the presentation of the results. The unit of learning selected was that of oral and written expression I, whose general competence to achieve is that the student uses informative messages, orally and in writing, correctly using Spanish grammar in various communicative situations.

To achieve this competence, three units with their respective particular competence are established within the study program, each consisting of two proposed learning outcomes (RAP) listed below:

Expresses ideas and / or emotions in various communicative situations respecting the basic forms of written language.

RAP 1: Shows the characteristics, similarities and differences between language, language and speech, exemplifying them in various informative texts.

RAP 2: Analyze various messages describing the level of the language to which they belong.

• Write informative texts using the exhibition models to express ideas and / or emotions.

RAP 1: Describe the qualities of the written expression and the characteristics of the exhibition models, exemplifying them in different texts.

RAP 2: Build expository texts using the characteristics of the models.

• Exhibits topics or issues using the qualities of oral expression to express ideas and / or emotions.

RAP 1: Identify the qualities and techniques of oral expression for use in various communicative situations.

RAP 2: Employs oral expression based on its qualities and the variety of exposure techniques to communicate ideas and / or feelings.

Specifically, the AOP methodology for this course was implemented in the manner set out below, and under the consideration that it is a process in which methods and techniques of documentary research are used, so that, in addition, They incorporated the aforementioned competences, which allowed them to be developed for the elaboration of a proposal to solve the specific problem of migration.

In this way, the phases of the AOP methodology for this study with their respective activities were the following:

1st phase: Assembly with the members of the group for the election and delimitation of the topic, highlighting proposals focused on the prevention of addictions; health care promotion; equity and gender; human rights; interculturality; social violence; science, technology and education; sustainable development and entrepreneurship.

In a second session, already having previous knowledge of the thematic axes, it was discussed and decided by only one with the purpose of carrying out its delimitation and justification, which resulted in the approach of a situation to be resolved in a specific context, and that it was interculturality, which was oriented in investigating what happens with the phenomenon of migration. Due to the fact that migratory flows have been accentuated throughout the world: people who are looking for better living conditions and opportunities for growth beyond their places of origin, whether due to labor, educational, economic, political and salary issues. However, on the way from one place to another they are victims of extortion, rape, abuse and disappearance, regardless of age or sex.

2nd phase: Search and selection of relevant information about the problem of immigration in articles of journals and scientific books, as well as conducting interviews with experts.

In this sense, for the documentary research, the characteristics of feasibility, novelty and importance were considered. Thus, the student was oriented to develop the theoretical framework and check the hypothesis, analyze and report the results. Having general information on the subject, the group was subdivided into teams, so that each one investigated the causes and consequences of migration in countries that present a higher percentage of this phenomenon, such as Syria, India, Mexico, Israel, Palestine, Afghanistan and Venezuela . During this process, the delivery and review of the progress of the research by the teacher was monitored.

3rd phase: Preparation of the report. The report corresponded to the main evidence that is intimately related to the development of competencies of the second learning unit, and which

refers to the writing of informative texts based on the use of expository models: chronological, cause-effect, thesis. antithesis and synthesis. This document allowed the teams to prepare proposals for solutions in order to assess the feasibility of each of them.

Likewise, in the formulation of the evidence, the use of the qualities of the writing was taken care of, as well as that it complied with the components of the minimum structure of an informative text: introduction, development and conclusions.

4th phase: Selection of the best strategy to generate the final evidence: news. Once the report was made, the last step was to decide how to present the results in a creative and innovative way. In plenary, the group, after an informed discussion, decided that each team made a newscast, so it was necessary to investigate, through the observation of various news, both its characteristics and its structure.

In addition, to follow up on the news planning, a team script and an individual script were requested; that will reflect the structure of the news: the name, motto, sections, curtains, presenters, correspondents or reporters; and the latter, the information that each one would present during their participation.

5th phase: Presentation of the project or news to the group for evaluation. Once the presentation schedule was completed, each team made the presentation and then made a coevaluation. Thus, the results expressed by the students were that the project favored academic and personal training, identifying the skills and attitudes that were created or developed, such as organization and teamwork, responsibility, creativity, individual organization, acquiring knowledge about Migration and interculturality, culture of different countries, information search and work with the use of ICT, item in which office tools stood out.

Next, in table 2, an example of an instrument used for the self-evaluation of the use of the qualities of oral expression during the development of the news exposures is presented.

Tabla 2. Instrumento de autoevaluación

Exposición oral	Excele	Muy	Regula	Insufic	No	Observaciones
Cualidades de la expresión oral						
Autodominio						
Organización de las ideas						
Fluidez						
Coherencia						
Sencillez						

Claridad						
Movimientos corporales						
Tono y modulación de la voz						
Comunicación no verbal						
Posición del cuerpo						
Expresión del rostro						
Movimiento de las manos						
Manejo del tema						
Domina el tema						
Organiza de ideas						
Presenta de hechos para sustentar las ideas						
Comunicación con el grupo						
Realiza preguntas						
Es mesurado en sus planteamientos						
Resuelve correctamente las preguntas planteadas						
Ejemplifica						
TOTAL						

Fuente: Elaboración propia

Population and sample

The study population was made up of students of upper secondary education in the first semester in an educational center taught by the IPN. To find the optimal sample size, the procedure recommended by Martínez (2012) was used, based on the following conditions: a population of 120 first-year high school students, a probability of success of 0.5 (p), a level of 95% confidence. Following these parameters, a representative sample of 88 participants was obtained.

Instrument

The instrument that was designed to obtain the information was a questionnaire based on a Likert scale and organized as follows: 1) Sociodemographic data of the participant and 2) Level of frequency in the development of soft skills organized in four categories: Interpersonal, Decision making, critical thinking and self-control and communication skills. The items were measured through a five-degree frequency scale that were: very frequently, frequently, occasionally, rarely and never. The instrument was submitted to an expert judgment in order to determine the validity of its content and then obtain its reliability and internal consistency using Cronbach's alpha coefficient, which was 0.811, which is why it was considered reliable.

Meanwhile, the application of the instrument was carried out in person, the information on the research was provided to the participants and the confidentiality of the data provided was stressed.

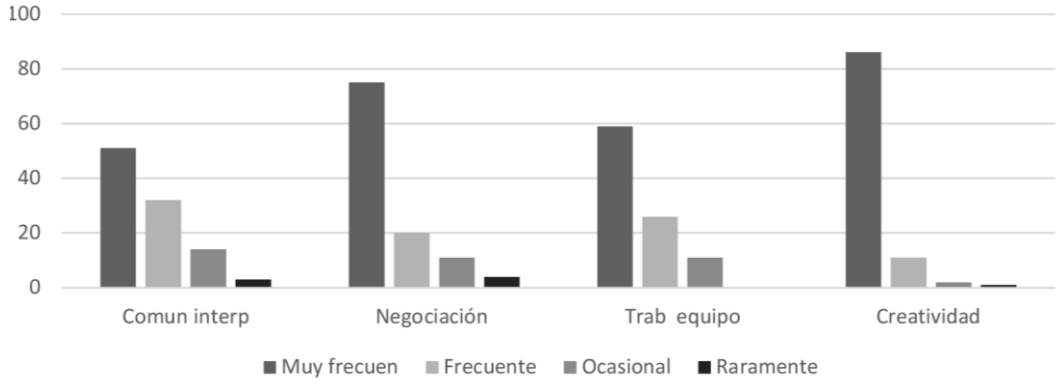
Once the field work was carried out, the information collected from the instrument was organized in order to carry out the descriptive analysis to determine the level of soft skills development in the students of higher secondary education.

Results

Regarding the gender of the study sample, it was distributed as follows: 59 men and 29 women, that is, in percentage terms, 67% and 33%, respectively.

The development of soft skills from the use of the AOP methodology is described below.

Figura 2. Habilidades interpersonales y de comunicación



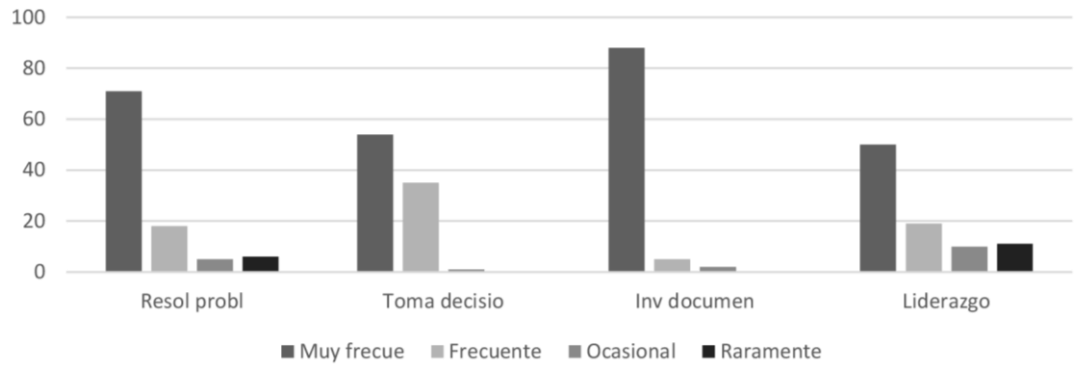
Fuente: Elaboración propia

Based on Figure 2, it was found that 56% of the students very frequently developed their interpersonal communication skills; 88% consolidated the negotiation; 67% recognized the relevance of teamwork, and 93% related to creativity. Therefore, the majority of respondents

stated that the teaching strategy based on the AOP favored the development of interpersonal and communication skills at this educational level.

This finding confirms what was found by research conducted by Palazuelos et al. (2018), Sánchez (2018), Landron et al. (2018) and Toledo and Sánchez (2018), who determined that the AOP is an active methodology for the formation of knowledge, skills, attitudes and values in the student body, and consequently cataloged it as a proposal that has an impact on achievement academic.

Figura 3. Habilidades de toma de decisión y pensamiento crítico



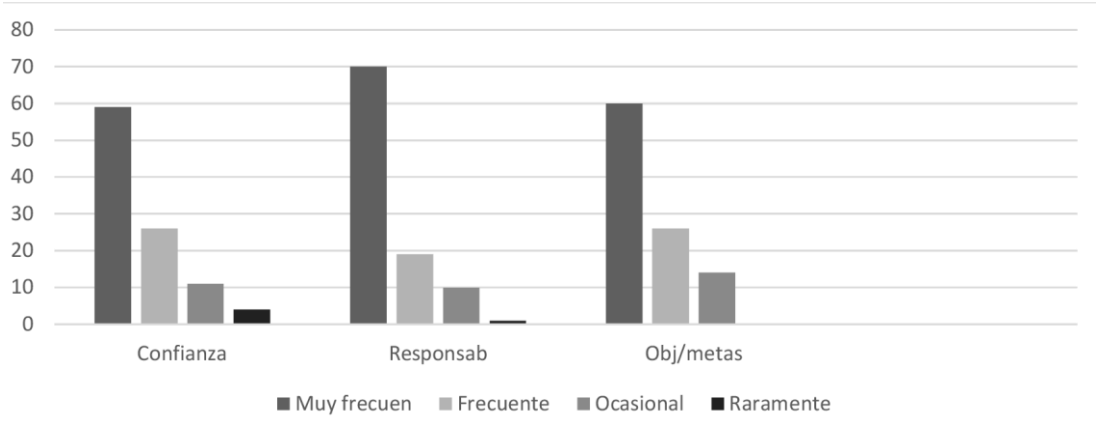
Fuente: Elaboración propia

As can be seen in Figure 3, the development of skills related to decision-making and critical thinking, according to the participants, was predominantly very frequent: documentary research in 88%, problem solving in 71%, takes of decisions in 54% and leadership in 50%. Regarding these same skills, 19% said they had developed frequently. Therefore, it is inferred that the AOP-based methodology favors these competencies, which will allow an increase in the skills of complex thinking of synthesis and analysis.

These results support the findings of both Rodríguez et al. (2018) as by Rico et al. (2018), who determined that the AOP has a positive effect on student training regarding the development of research skills for problem solving.

The findings of Alvarado et al. (2018), in whose study participants positively assessed the use of AOP for their academic training because it enabled them to develop the project and develop critical thinking.

Figura 4. Habilidades de autocontrol y afrontamiento

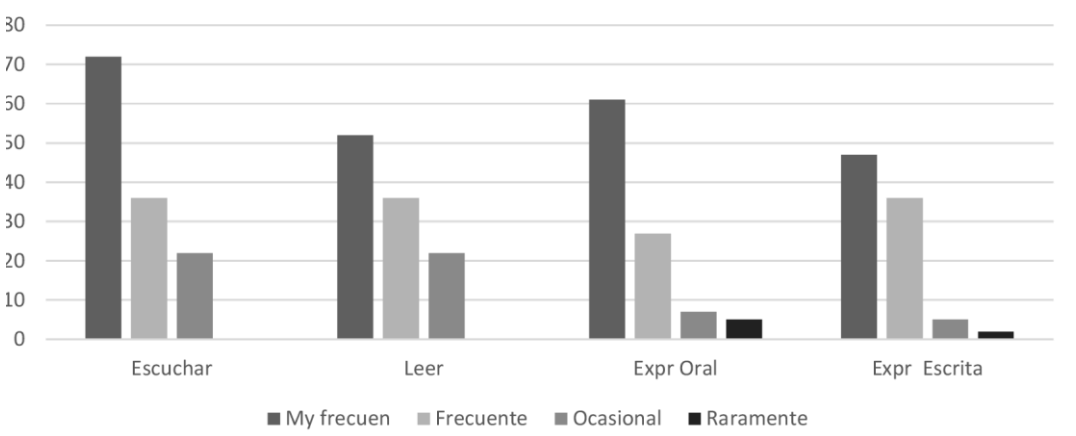


Fuente: Elaboración propia

Figure 4, meanwhile, graphically shows the result of self-control and coping skills. In this regard, students indicated a very frequent development in responsibility (70%), in setting objectives and goals (60%) and in increasing personal confidence (59%). Therefore, these skills, when developed, also allow to achieve habits and values that favor their individual processes and social interaction with others.

These data support the provisions of Toledo and Sánchez (2018), González et al. (2018) and Landron et al. (2018) in relation to the AOP developing the responsibilities, responsibility and trust competences, which leads to the achievement of the objective of the project to be carried out.

Figura 5. Habilidades comunicativas desarrolladas



Fuente: Elaboración propia

Finally, in figure 5 the result is plotted regarding the development of communication skills through the teaching strategy of the AOP. As can be appreciated, the participants very frequently highlighted the knowledge of listening (72%), oral expression (61%), reading (52%) and written

expression (47%). Thus, this finding demonstrates the perception of generic or transversal competencies necessary in the performance of the daily, academic life and tasks of each profession.

This result corroborates what was found by Sánchez (2018), González et al. (2018) and Alvarado et al. (2018) in what refers to the fact that the AOP favors the development of oral and written communication together with that it contributes to a better analysis and argumentation of the project to be carried out, due to the reading, exchange of information and design of the strategy of resolution of the project.

Discussion

Based on the results obtained, this research confirms that the AOP encourages active learning, where the student participates in the construction of disciplinary knowledge and the development of soft skills, as previously noted by Davcev et al. (2016).

With regard to the development of collaborative work, it integrates attitudes that favor it as creativity, negotiation with a view to having similar experiences to those in the future, which confirms what was found both by Willard and Duffrin (2003) and by Carrasco et al. (2015).

In the same way, the use of the AOP, throughout its implementation, integrates interdisciplinary learning environments, mediated by ICTs, which also implies identifying, analyzing, discerning and selecting that information relevant to the project, so that The findings of Álvarez and Boillos (2015) are confirmed.

Therefore, as stated by Konopka et al. (2015), it is necessary to include ICT in the academic training of students to achieve their greater participation in learning using an active didactic methodology such as the AOP.

However, the AOP methodology has limitations, strengths and weaknesses, which are important to mention to elucidate the best way to deal with them, as well as allow future studies. The main strengths are the following:

- The strengths found confirm the theoretical-practical nature to solve the problem addressed.
- It begins with the knowledge of a relatively new concept: soft skills.
- The results of the research can motivate the integration of the AOP methodology and conceptualize or reconceptualize the functions of the teacher and the student, as well as the teaching-learning process.

Regarding the main weaknesses:

- The project follow-up time was one semester due to the changes of teachers to the groups.

- The difficulty to socialize or show the results to the community.
- The main limitations are the following:
- The period to implement the AOP methodology was in accordance with official dates of one semester, in real time of four months.
- Consider the sample size, 88 students was the minimum number of students that make up the population, only 2 groups of 36.
- Difficulty of integrating programs in force since 2008 with a methodology or strategy of the most recent and innovative, to overcome the difficulties for the implementation of work, evaluation and product.

Conclusions

As mentioned at the beginning of this text, the main objective of the study was to develop soft skills in students of the upper middle level of the National Polytechnic Institute by implementing the AOP methodology. This was achieved because they recognized the achievement of their competencies in the four proposed categories, namely: Interpersonal, Decision-making, Critical and self-control thinking and communication skills.

In this sense, the relevance of the study was to provide transcendental information for the upper secondary education provided by the IPN, according to the students' perception, in order to be able to implement training actions aimed at the consolidation of soft skills from the use of AOP methodology.

In this way, the present investigation confirms that the AOP encourages student-based learning, who in turn undertakes the construction of learning knowledge feeling motivated by being he who makes a proposal or solution to a real situation, by being the one who discovers some information that was not within his reach and, most importantly, to discover skills and attitudes he did not know.

It also fosters collaborative work by integrating attitudes that favor it, such as creativity and negotiation, which allows it to direct its own activities, exercising leadership, coupled with learning from and with others.

In the same way, the AOP integrates interdisciplinary and ICT-mediated learning environments. Both tools increased and nurtured the tasks during the project process, the information to be investigated, and contributed to the motivation and communication of the participants.

While the evidence of learning developed through the news program, which emerged from the selection of a current problem in a context similar to the workplace, enabled the development of soft skills.

Individually, the student acknowledged that working on the AOP favored having common and clear objectives, taking responsibility, formality in the delivery of advances, as well as selecting and synthesizing information, so that it was developed to be critical, tolerant, respectful, in addition to promote creativity, collaboration, solidarity, have initiative and enjoy the work, which led to satisfaction with the project obtained with the pleasure of being recognized. Therefore, this type of evidence and its organization generated learning related to the real world, and facilitated the construction of knowledge, attitudes and skills in a comprehensive manner. Finally, the AOP allowed students to experience a meaningful learning experience where research, collaborative work and skills development went beyond the programmatic, preparing them for a world outside the classroom.

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