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## **Presentation of the Content**

In issue sixteen, is presented an article *Manufacturing cell reengineering for teaching Mechatronics Engineering*, by CANO-CORONA, Ariana, HERNANDEZ-ZEMPOALTECATL, Rodrigo, AGUILAR-AGUILAR, Álvaro and MENDEZ-ZAPATA, Elías, with adscription at Universidad Politécnica de Tlaxcala, in the next article *Charting a path to healthy coexistence: a comparative study on bullying and the teaching of values in secular and religious schools*, by VILLARREAL-SOTO, Blanca Margarita ESPERICUETA-MEDINA, Marta Nieves, CEPEDA-GONZÁLEZ, María Cristina and SANCHEZ-RIVERA, Lilia, with adscription at Universidad Autónoma de Coahuila, in the next article *Social marketing, a dissemination tool in the regeneration of petunia plants (*Petunia hybrida*) from cotyledons*, by ESPEJO-MARTÍNEZ, Abraham & ESPEJO-CRUZ, Abigail del Carmen, with adscription in the Universidad Autónoma “Benito Juárez” de Oaxaca and Universidad Politécnica de Valencia, in the next article, *Bibliometric analysis of safety in sport in the EBSCO Host database*, by ACOSTA-GONZALEZ, Ariana Linette, ZAMORA-RODRÍGUEZ, Diana Rubí, MORENO-HERNÁNDEZ, Zaid Alejandro and PADILLA URQUIDI, Victor Andres, with adscription in the Universidad Autónoma de Nuevo León.

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**Manufacturing cell reengineering for teaching Mechatronics Engineering****Reingeniería de celda de manufactura para la enseñanza de Ingeniería Mecatrónica**

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**Abstract**

Next, the reengineering of a manufacturing cell is presented, as a didactic intervention in the teaching of Mechatronic Engineering, this redesign is proposed from a previously proposed cell and in which a FANUC R-2000iA/210F industrial robot is incorporated. And with this modification to the cell, students are expected to develop linkage projects with the industrial sector of the State region. The results obtained by the teaching work team are the reengineering, simulation and proposal of educational intervention practices in which students reinforce the expected skills during their professional training and thus achieving the physical integration of the teams, bringing future engineers to the real contexts of professional development. The impact and relevance of reengineering is based on the fact that the graduation profile of mechatronics engineering establishes the synergy of mechanical, electronic, control and automation elements, to technologically improve companies in the region.

**Resumen**

A continuación se presenta la reingeniería de una celda de manufactura, como intervención didáctica en la enseñanza de la Ingeniería Mecatrónica, este rediseño se propone a partir de una celda ya propuesta con anterioridad y en la cual se incorpora un robot industrial FANUC R-2000iA/210F, y con esta modificación a la celda, se espera que los estudiantes desarrollen proyectos de vinculación con el sector industrial de la región del Estado. Los resultados obtenidos por el equipo de trabajo docente, son la reingeniería, simulación y propuesta de prácticas de intervención educativas en las que los estudiantes refuercen las competencias esperadas durante su formación profesional y logrando de esta forma la integración de forma física de los equipos, acercando a los futuros ingenieros a los contextos reales de desarrollo profesional. El impacto y pertinencia de la reingeniería se fundamenta en que el perfil de egreso de la ingeniería en mecatrónica establece la sinergia de elementos mecánicos, electrónicos, de control y automatización, para mejorar tecnológicamente las empresas de la región.

**Manufacturing cell, Mechatronics, Reengineering****Celda de manufactura, Mecatrónica, Reingeniería**

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## Introduction

Derived from the challenges and inequalities of competitiveness at regional and national level, the labor sector of the Puebla Tlaxcala Metropolitan Zone (ZMPT), puts pressure on the industries of the manufacturing sector to promote regional development, so for higher education institutions focused on the engineering areas, it is a priority to provide a comprehensive education to future engineers, which should handle technological and human resources that allow them to compete within these markets and strengthen their professionalization.

In recent years, some economic indicators in the State of Tlaxcala have shown a positive evolution as some companies have focused their efforts on increasing productivity through the use and exploitation of new technologies.

The integration of areas within the company, as well as the development of projects that link technology transfer between higher education institutions and processes are possibilities to increase productivity, thus encouraging students to integrate the systems that are available in the Academic Program replicates the intention of contributing to the improvement of enterprises.

## Reengineering of the manufacturing cell as a didactic intervention

The didactic manufacturing cell, designed, developed and implemented since 2019 in the Mechatronics Engineering Academic Program, presents several areas of opportunity, since a key element that impacts its performance is the element manipulation element, normally awarded to a robotic arm.

With the intention of improving the academic impact with the use of the manufacturing cell, it is proposed to use a FANUC R-2000iA/210F robotic arm, which belongs to the latest generations of robots that can support a heavy load, in addition to presenting great performance, safety and manipulation by students.

According to the design and technical research carried out previously, the mechanical, electrical and electronic elements that integrated the cell and that were the most suitable to allow the implementation of the cell are the following (see Table 1).

Elements		Features
1	Modular Conveyor "L"	16-gauge, 16-gauge, ¼ Hp, 220-440 Vac, 3-phase motor.
2	Programmable logic controller	PLC S7-1200
3	Robotic arm	Motoman NX100 HP3
4	Numerical control lathe	CNC EMCO 250 Bar capacity: 25.4 mm Axes: 3 Power: 5.5 kW Max. RPM: 6,300 Turning diameter: 85 mm Turning: 250 mm Machine length: 255 mm
5	Electric panel, frequency inverter and start and end sensors	

**Table 1** Elements that integrated the didactic manufacturing cell

Source: Own elaboration

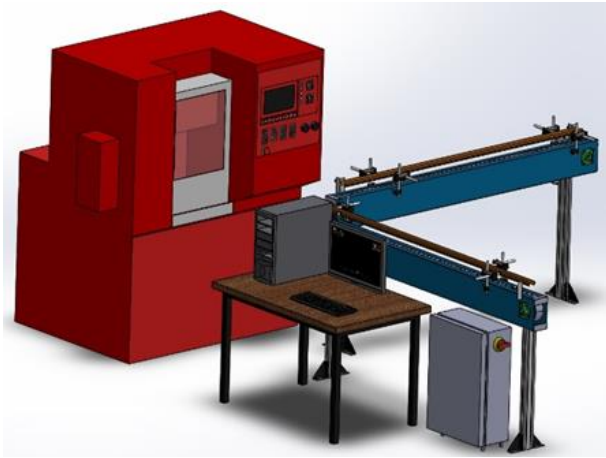
According to the dimensions where the manufacturing cell was installed, the modular conveyor (belts) was 100 mm wide by 2000 mm long and 900 mm high.

With the support of the Solid Works software, an "L" configuration was proposed in order to load and unload the material to be machined in the CNC lathe, since the FANUC R-2000iA/210F robot arm is integrated in this stage.

The movement of the belts can be carried out in both directions, through a transmission gear and a safe and efficient return system is used, since the positioning depends on the mechanical model.

The flexibility of the manufacturing cell allows the configuration of different processes and thus diversify the possibilities of didactic interventions in the learning of students through the development of practices.

The conveyor modules have lateral guides to support the optimal path of the parts on the belt and facilitate their detection by means of the sensors.



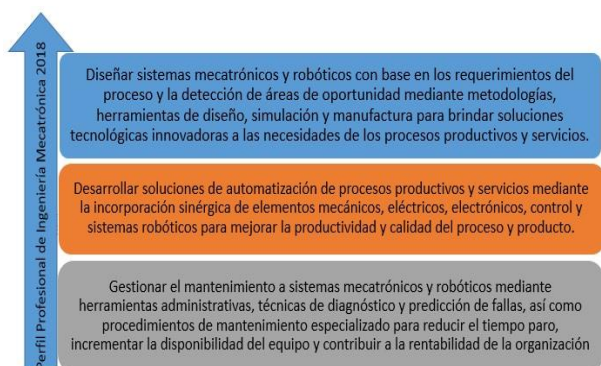
**Figure 1** Original design of the manufacturing cell  
Source: Own elaboration

### Implementation of the reengineering

The original design of the manufacturing cell was in operation for approximately 3 years, in which positive results have been obtained, however this year we had the opportunity to perform a reengineering with the adaptation of some mechanical, electrical and electronic elements and mainly the implementation of the FANUC R-2000iA/210F robotic arm.

The reengineering, in addition to the technical elements, was rethought to achieve substantial improvements in the didactic interventions that allow students to achieve the necessary technological training during their stay at the University and allow a direct impact on the successful labor insertion of the graduates (see figure 2).

In this way, it was considered that in addition to the use of designs and simulations with software, the cell will allow them to generate models and implement technology transfer projects as close as possible to the real industrial context.



**Figure 2** Benefits of reengineering in the Mechatronics Engineering graduation profile  
Source: Own elaboration

Once the academic and labor sector analyses were carried out, the integration of the elements was redefined, and the cell is currently made up of the following elements (see Table 2).

Elements		Characteristics
1	Modular "L" Conveyor	Table top, 16 gauge and ¼ Hp motor, 220-440 Vac, 3-phase
2	Programmable Logic Controller	PLC S7-1200
3	Robotic Arm	Number of axes: 6 Load capacity: 165Kg. Maximum horizontal reach: 2650 mm. Repetition accuracy: 0.18 mm. Controller: RJ3iB
4	Numerical Control Lathe	CNC EMCO 250 Bar capacity: 25.4 mm Axes: 3 Power: 5.5 kW Max. RPM: 6,300 Turning diameter: 85 mm Turning: 250 mm Machine length: 255 mm
5	Electric panel, frequency inverter and start and end sensors.	

**Table 2** Elements that make up the reengineering of the didactic manufacturing cell  
Source: own elaboration

#### Modular "L" conveyor

Consisting of #14-gauge black sheet slats, the single hinge conveyor with straight chains for heavy loads and vacuum-hardened stainless steel pins.

The conveyor has advantages of high strength, and the slats have low noise level and friction coefficient, do not absorb liquids and have good chemical and wear resistance. The dimensions are 2m long by 10cm wide and 0.9m high. It has 4 photoelectric sensors of the C2DP-11P series with a census range of 110 mm, PNP.

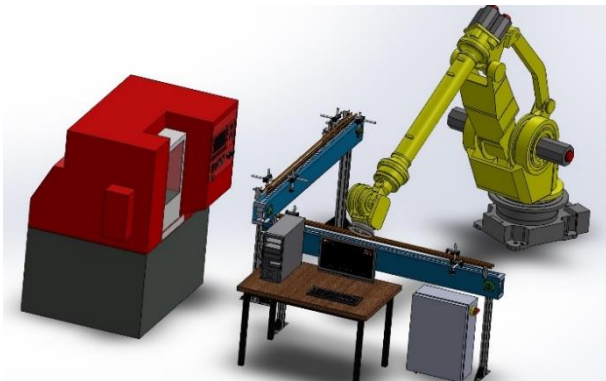
The system control is done with a programmable logic controller PLC SIMATIC S7-1200 with CPU 1214C with 14 digital inputs type sink/source at nominal voltage of 24 VDC at 4 mA and 10 digital outputs type relay, voltage range of 5 to 30 VDC or 5 to 250 VAC with a maximum current of 2 Amp. and 2 analog inputs type voltage (unipolar) with voltage range of 0 to 10 V and resolution of 10 bits.

### EMCO 250 CNC Lathe

This semi-industrial equipment has a 12 tool turret, with a maximum turning diameter of 85 mm, maximum turning length of 225 mm and robotic interface, although it does not have support for raw material, the robotic arm that is being implemented can take and remove parts from the chuck.

### Robotic arm

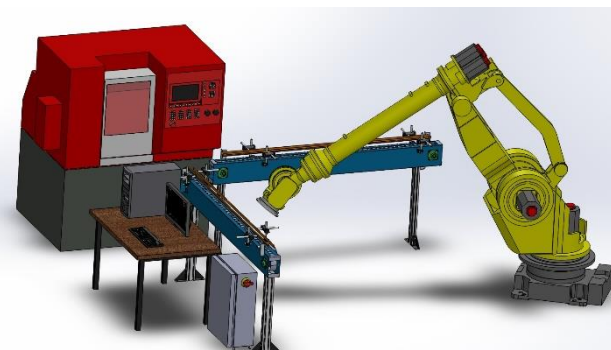
R-2000iA robot series with large capacity (average 165Kg), wide working space (horizontal reach, 2650 mm) and slim profile design, with RV reducers and repeat accuracy of 0.18 mm, RJ3iB controller, easy I/O connections and teach pendant for easy programming.



**Figure 3** Re-engineering of the manufacturing cell  
Source: Own elaboration

### Computerized control station

To perform the communication and coupling of the equipment of the manufacturing cell, there is a physical connection with real time cards and RS232 connectors, in addition to managing the communication protocol of the equipment. The physical characteristics of the computer equipment are 4G of RAM memory, 2T hard disk, i7 processor, 22" monitor, network cards, keyboard and mouse (see figure 4).



**Figure 4** Manufacturing cell with the incorporation of new industrial elements  
Source: Own elaboration

### Results

Once the reengineering is implemented with the installation of the FANUC R-2000iA/210F robot, the manufacturing cell becomes a semi-industrial automation cell, since its programming would allow to speed up and maximize the repeatability levels of the process being carried out (see figure 5).



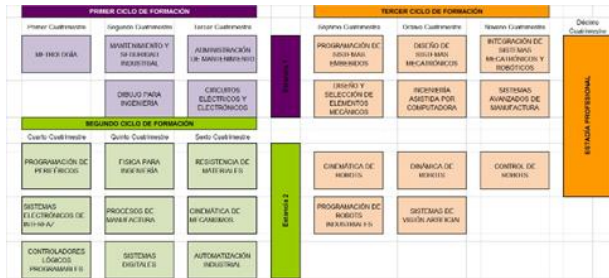
**Figure 5** Real image of the reengineering applied to the manufacturing cell  
Source: Own elaboration

In terms of educational benefits, the university's initial investment could result in a return on that investment since the manufacturing cell could not only be applied as an educational intervention, but also to provide training for some companies in the region (see Figure 6).



**Figure 6** Lateral view of the reengineering applied to the manufacturing cell  
Source: Own elaboration

The implementation of the didactic manufacturing cell allows to carry out practices that currently integrate two or more subjects (see figure 7) and at the same time promotes the development of specific competencies of mechatronic engineers that are currently requested and required by the regional labor market.



**Figure 7** Use of the manufacturing cell in the subjects of the Mechatronics Engineering curriculum  
 Source: Own elaboration

Another academic benefit that has been obtained is the use of the manufacturing cell by other engineering courses at the University (industrial engineering, automotive systems engineering), as well as the proposal to offer courses and/or workshops through the continuing education program to companies and educational institutions in the region.

**Acknowledgment**

To the Academic Program of Mechatronics Engineering of the Polytechnic University of Tlaxcala, for the facilities granted for the realization of this work.

**Conclusions**

Among the main results obtained so far are the possibilities of linking the educational institution with the industrial sector of the region, as well as improving the probabilities of labor insertion of the graduates, since having a context as close as possible to real industrial processes is fundamental for the optimal and pertinent development of future mechatronic engineers.

Although the development of competencies with computerized models has been useful in teaching-learning activities, the implementation of practices with semi-industrial applications (spot or arc welding, assemblies in general, extraction and transfer of materials), allow the emulation of the behavior of productive processes very similar to real situations and having this semi-industrial equipment is of great benefit in the professional competencies of students and graduates.

The design, development and implementation of the didactic manufacturing cell and now its reengineering, allows us the possibility to perform practices that integrate two or more subjects, strengthening the specific competencies of mechatronic engineers that are currently required by the regional labor market.

With these elements, it will be possible to reinforce the linkage of the UPTIax with the business sector and institutions of higher and higher education in the region, as well as to improve the supply of continuing education and the operation and maintenance of the manufacturing cell.

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## Charting a path to healthy coexistence: a comparative study on bullying and the teaching of values in secular and religious schools

### Trazando un camino hacia la convivencia saludable: un estudio comparativo sobre el bullying y la enseñanza de valores en escuelas laicas y religiosas

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#### Abstract

Bullying, or bullying, is conceptualized by Echeverri and Vargas (2018) as the deliberate and systematic violence of one or more students towards another, generating an imbalance of power. The study, which approached 104 sixth-grade students in private and public schools, used a comparison design with an instrument of 49 variables, 5 of them signalized, and analyzed with Statistica. The main objective was to examine the relationship between bullying and the teaching of values in secular and religious schools. The results highlighted the importance of parental responsibility in social cohesion, as well as the need to address socio-emotional development and self-knowledge to prevent bullying. The promotion of a healthy coexistence between parents contributed to the academic efficiency and emotional management of the students. The recognition of individual qualities boosted self-esteem, reducing levels of violence in the classroom. The intervention proposal suggests the creation of a model that integrates mandatory socio-emotional subjects, strengthening the prevention of bullying and promoting a safe and positive educational environment. This research offers a valuable contribution to the field by highlighting crucial factors for school coexistence and proposing practical strategies for the continuous improvement of the education system.

**Bullying, Secular education, Religious values**

#### Resumen

El bullying, o acoso escolar, conceptualizado por Echeverri y Vargas (2018) como la violencia deliberada y sistemática de uno o más estudiantes hacia otro, generando un desequilibrio de poder. El estudio, que abordó a 104 estudiantes de nivel primaria en colegios privados y públicos, empleó un diseño de comparación con un instrumento de 49 variables, 5 de ellas señalíticas, analizado con Statistica. El objetivo central fue examinar la relación entre el bullying y la enseñanza de valores en escuelas laicas y religiosas. Los resultados destacaron la importancia de la responsabilidad parental en la cohesión social, así como la necesidad de abordar el desarrollo socioemocional y autoconocimiento para prevenir el acoso escolar. La promoción de una convivencia saludable entre padres contribuyó a la eficiencia académica y al manejo emocional de los estudiantes. El reconocimiento de las cualidades individuales potenció la autoestima, reduciendo los niveles de violencia en las aulas. La propuesta de intervención sugiere la creación de un modelo que integre materias socioemocionales obligatorias, fortaleciendo la prevención del acoso escolar y promoviendo un ambiente educativo seguro y positivo. Esta investigación ofrece una valiosa contribución al campo al destacar factores cruciales para la convivencia escolar y proponer estrategias prácticas para la mejora continua del sistema educativo.

**Bullying, Educación laica, Valores religiosos**

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## Introduction

In the current Mexican panorama, violence emerges as an issue of utmost relevance and urgent need to be addressed. The insecurity that permeates the country's daily life has given rise to growing levels of concern, manifesting a problem that is progressively expanding.

Within this context, school bullying, known as bullying, has emerged as a tangible expression of violence in the educational sphere. The definition proposed by Echeverri and Vargas (2018) underlines its deliberate and systematic nature, generating an imbalance of power between one or more students. This phenomenon has gained notoriety in educational conversations, suggesting that it could constitute a significant barrier to learning and skills development during formative stages.

Specialists in this field have directed their efforts towards the eradication of this practice at all levels of education, giving way to an approach focused on the promotion of values as a means of fostering healthy coexistence among peers.

It is essential to contextualise the problems and issues that characterise individuals at different stages of their lives, with adolescence being a crucial period for personal development. In this study, special attention will be given to this stage, recognising its importance in the development of individuals.

The general objective of this work focuses on exploring the relationship between bullying and the teaching of values in primary school students, both in public and private education.

The theoretical importance of this research lies in the integration of specialised literature linking bullying and values. From a methodological perspective, the value of this work is based on the use of a research instrument that will generate key information to understand these phenomena in a deeper way.

## Theoretical framework

In the current context of Mexico, violence presents itself as an issue of utmost relevance and urgent need to be addressed.

The growing daily insecurity in the country has generated widespread concern, aggravated by pandemic circumstances that affect not only nationally, but also globally. In this scenario, school harassment, translated as bullying, emerges as a specific expression of violence in the educational sphere.

According to the definition of Echeverri and Vargas (2018), bullying is configured as an act of deliberate and systematic violence, carried out by one or more students towards another, generating an imbalance of power. This practice has gained relevance in educational discourse, being considered a potential barrier to learning and skills development in learners.

School violence, according to Jaramillo (2018) and the United Nations (2019), encompasses a wide range of aggressive physical or psychological acts, which can occur both in and out of school, including cyberspace. Factors such as mental disorders, phobias and exposure to violence in the family environment contribute to the manifestation of aggressive behaviours in students (Flores, 2017; Toledo et al., 2018).

The study of school violence has led to the identification of different explanatory theories, from genetic to signal-activation (Parra et al., 1992). The family emerges as a crucial factor, with the family micro-system being an important source of violence (Díaz-Aguado, 2006). However, prolonged exposure to violence can lead to a binary perception of the world, where the roles of aggressor and aggressed become dominant (Díaz-Aguado, 2006).

The term "coexistence problems", proposed by Bizcocho & Bizcocho (2003), offers a broader and more positive perspective to address school violence, including interpersonal conflicts and verbal aggression. The importance of values in mitigating these problems is highlighted as a crucial approach.

The teaching of values becomes a fundamental tool to promote healthy coexistence among peers. Quintanilla & Salinas (2017) stress that values act as mediators in social interaction, being essential for personal development. Individual perception of what is good or bad is organised into scales of preference, influencing the formation of personality and interpersonal relationships (Tierno, 1994; Martínez, 2016).



Adolescence, a vital stage identified by Papalia (1985) and Arias (2013) in three periods, is presented as a critical time in which adolescents experience significant physical and psychological changes. The family environment, affective relationships and social acceptance play a crucial role in their emotional and social development.

During this period, emotional autonomy, emotional relationships, social acceptance and the search for identity are essential for healthy adolescent development (Rice, 2000). However, the pressure to conform to stereotypes and the influence of the environment can generate emotional conflicts and negatively affect interpersonal relationships.

In conclusion, the relationship between bullying, values and development during adolescence is a complex and multidimensional field. Addressing these issues requires not only prevention and intervention strategies, but also a holistic approach that considers the teaching of values as a key tool to foster a more positive coexistence.

### **Methodology to be developed**

This study adopts a comparative and differential design, addressing both the target population and several significant variables.

The operational structure of the study focuses on the formulation of a research approach, the design of a working methodology and the operationalisation of the results in order to propose effective interventions.

The population under study comprises primary school students from both public and private institutions with a focus on theological values.

The methodological design is based on a comparative approach, with a sample of 104 primary school students, equally distributed between public schools (52) and public schools (52). The research instrument consists of 49 variables, of which 5 are signalistic. The information was processed qualitatively and quantitatively using Statistica.

The research instrument is characterised by three specific steps that detail the instructions for its application. It is emphasised that responses should be recorded on a scale from 0 to 10, where 0 represents the absence of the attribute and 10 indicates its maximum presence. Furthermore, it is stressed that there are no right or wrong answers, and it is instructed that there should be no unanswered questions.

The instrument, composed of 49 questions, is divided into two sections: 26 questions address the topic of bullying, while the remaining 23 focus on contrasting values. Each question has an adjacent blank space for the answer on the mentioned scale.

For relative objectification, specific statistical software will be used. Statistics will be used for characterisation, SPSS will provide the correlation of variables, and Excel will be used for the creation of graphs representing data, means and percentages. This comprehensive methodological approach ensures a thorough analysis of the data collected and an accurate interpretation of the results obtained.

### **Results**

In order to provide an explanation of the research axes on bullying and values, which constitute the phenomenon of study, analyses of relative frequencies obtained through the application of the research instrument were carried out. This was carried out using different statistical programs with the purpose of characterizing both the population and the phenomenon of study, through the analysis of frequencies, percentages, correlations and comparisons.

It is important to note that, for the development of parametric statistics, we chose to apply the law of large numbers. This choice was based on the significance found in the correlation between means and medians, in order to increase the levels of confidence in the explanations provided.

#### *Frequencies and percentages*

The results of the statistical processing of frequencies and percentages for the variables Sex, Age, Number of siblings, Religion, Sport and Bullying, which make up the phenomenon under study, are presented below.

*Variable sex*

The analysis reveals that of the 104 students surveyed in the sixth grade of primary school, 46 belong to the female sex, representing 44.23% of the total population. On the other hand, the male sex is composed of 58 subjects, representing 55.76% of the population.

*Age*

It is observed that 26 students are 12 years old, constituting 25% of the sample, while 77 subjects are 11 years old, representing 74%.

*Number of siblings*

Of the students surveyed, 7 have no siblings, representing 6.73% of the total population. In contrast, 97 students have siblings, representing 93.26%. It is suggested that the extrapolation with the highest degree of confidence will be for those students who do have siblings.

*Religion*

In relation to religion, 1 student belongs to the Jehovah's Witnesses, representing 0.96% of the total population, while 83 students practice the Catholic religion, constituting 79.8%.

*Sport*

It is observed that 29 students do not practice sport, representing 27.88%. On the other hand, 75 subjects practice sport, representing 72.11%.

*Bullying*

Regarding the variable Bullying, 45 students have been victims, representing 43.26% of the population, while 59 subjects have not suffered Bullying, representing 56.73%.

*Characterisation*

The main results of the 49 variables that make up the study phenomenon, divided into 26 on bullying and 23 on values, are presented below. Regarding the statistics that centre, scatter and confirm normality, it is observed that most of the variables are predictors of the population ( $z \geq 1.96$ ), with a confidence level of 95%.

Regarding the mean ( $\bar{x}$ ), it is noted that certain variables show high values, indicating that students in a healthy family environment can perform better in school dynamics and in their interpersonal relationships.

In the C.V statistic, it is observed that most of the variables are characterised as a group of opinion with equal characteristics ( $CV \leq 51$ ). In addition, the means of means are analysed to identify the variables that are in the low values of the scale (0 to 3), suggesting that the selected population is immersed in a conflictive environment, which complicates the development and coexistence in their interpersonal relationships within the classrooms.

*Correlation*

The correlation reading was carried out through Pearson's processing, corresponding to parametric statistics. A significance level of  $P=0.001$  was used, equivalent to a correlation of  $r=0.37$ .

It was observed that when the subject trusts his parents to talk about a problem, he achieves an attitude ( $r = 0.56$ ) of security ( $r = 0.46$ ), allowing him to develop self-esteem ( $r = 0.44$ ), which favours dialogue with his peers. It can be inferred that the solidification of society is based on parental responsibility.

By sharing moments of recreation as a family, the subjects acquire an attitude ( $r= 0.56$ ) of security ( $r= 0.45$ ), which allows them to show their feelings ( $r= 0.43$ ), motivating them to interact ( $r= 0.42$ ) through dialogue ( $r= 0.40$ ), strengthening their self-esteem ( $r=0.36$ ) and self-confidence ( $r=0.36$ ). At the same time, it generates an attitude of respect ( $r= 0.35$ ) towards the rules ( $r= 0.34$ ) in their school community, collaborating ( $r= 0.34$ ) in the creation of an atmosphere of freedom ( $r= 0.33$ ). It can be inferred that coexistence within the family environment is fundamental for the development of the individual.

When students trust their teacher, they can turn to him/her for solutions to any problem ( $r= 0.38$ ) in the classroom, helping to generate an atmosphere of harmony ( $r= 0.37$ ), which motivates them to have a collaborative attitude ( $r= 0.33$ ) ( $r= 0.32$ ).

It can be inferred that the teacher is a key element in creating a good classroom climate that helps the integral development of the pupil.

If the parents of the subjects live together in harmony, they generate that their children have confidence ( $r= 0.50$ ) in themselves and in their environment, which allows them to develop communication skills ( $r= 0.40$ ) within their school environment, achieving compliance with the rules ( $r= 0.35$ ) and being collaborative ( $r= 0.35$ ) with their classmates. It can be inferred that healthy coexistence between parents enhances academic efficiency and the management of students' emotions.

When the subjects manage to have communication in their family environment, they show trust ( $r= 0.54$ ), respect ( $r=0.48$ ) and a collaborative attitude ( $r= 0.45$ ) ( $r= 0.37$ ), which favours dialogue ( $r= 0.37$ ) for the fulfilment of the rules ( $r= 0.36$ ), generating feelings ( $r= 0.33$ ) that help their self-esteem ( $r= 0.32$ ). It is inferred that communication is an essential skill for the strengthening of a responsible society.

It is observed that when the subjects comply with the rules, they acquire a collaborative attitude ( $r=0.58$ ) that generates trust ( $r=0.43$ ) and kindness, allowing them to live together in harmony ( $r=0.32$ ). It can therefore be inferred that respect for laws and norms generates responsible and committed citizens.

If students feel motivated, they show security ( $r=0.63$ ), self-esteem ( $r=0.61$ ) and interact ( $r= 0.47$ ) in class, strengthening dialogue so that they can express their feelings ( $r= 0.42$ ) and recognise their qualities ( $r= 0.40$ ), providing freedom ( $r= 0.37$ ) to live together in harmony ( $r= 0.33$ ) in the classroom. It can be inferred that an optimal classroom environment creates successful and emotionally healthy students.

When the subjects feel secure in their environment, they manage to act with freedom ( $r= 0.56$ ), which generates self-esteem ( $r= 0.47$ ) and helps them to recognise their qualities ( $r= 0.46$ ), to relate in harmony ( $r= 0.41$ ) and to solve problems through dialogue ( $r= 0.34$ ). It is inferred that when students express what they feel through what they like, they reduce violent attitudes and develop more freely.

If the subjects have the ability to express what they feel, it helps to create an atmosphere of fraternity ( $r= 0.47$ ) that allows them to feel free ( $r= 0.45$ ) to carry out activities, putting into practice their qualities ( $r= 0.39$ ) for interaction ( $r= 0.38$ ) and dialogue ( $r=0.36$ ), strengthening their self-esteem. It can be inferred that if the school places special emphasis on the emotional health of the students, they will be able to develop in a healthy environment that strengthens their performance in their academic activities.

Students feel free in a harmonious environment ( $r= 0.44$ ), which allows them to interact ( $r=0.41$ ), making use of their qualities ( $r=0.41$ ), and respecting ( $r=0.35$ ) others. It can be inferred that the recognition of the students' qualities boosts their self-esteem, giving them the freedom to innovate and thus reduce the levels of violence in the classroom.

#### *Comparison*

A comparative analysis of the variables that make up the study phenomenon will be carried out by means of a T-test processing for independent samples applied to 104 subjects in the STATISTICA programme. The analysis focuses on the comparison between the results of surveys carried out in public and private institutions, with a probability level of  $P=0.0005$ .

#### *Variable Violence*

In the violence variable, it is observed that the students of the private institution present more aggressive attitudes (4.58) than the students of the public school (2.33). It is inferred that the fact of taking subjects with religious values does not influence the behaviour of the students.

#### *Variable fear*

In the fear variable, it is observed that the students of the private institution have felt insecure (2.50) when going to school, in contrast to the students of the public school (0.54). It can be inferred that, despite the care provided by teachers in a private institution with religious values, children feel some fear from their peers.

*Variable belittling*

In the variable belittling, it is observed that the students in the private institution feel less (3.50) than their peers compared to the students in the public school (1.35). It is inferred that, in institutions with religious values, students have good emotional health.

In the reading of the dominance variable, it is observed that students in the private institution have been forced to do things they do not want to do (2.19) compared to students in the public school (0.27). It is inferred that students in private institutions with religious values tend to have more authoritarian attitudes.

In the self-esteem variable, we read that students in the public school feel comfortable with their physical appearance (6.85) compared to students in the private institution (6.85). It is inferred that pupils in a public and secular institution have good self-esteem which enables them to develop positive socialisation skills.

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**Conclusions**

In conclusion, when analysing the frequencies and percentages, it stands out that the male sex predominates in the student sample. In terms of characterisation, it is evident that those students who come from a healthy family environment show a better performance both in school dynamics and in their interpersonal relationships.

In the correlation analysis, the transcendence of parental responsibility in the solidification of society is underlined, as well as the crucial importance of family coexistence for the integral development of the individual. In addition, the fundamental role of the teacher in creating a conducive environment within the classroom that contributes to the integral development of the pupil is highlighted. Communication skills emerge as an indispensable pillar for strengthening a responsible society, while respect for laws and norms is revealed as a determining factor in the formation of responsible and committed citizens.

In the field of education, it is concluded that an optimal classroom environment not only favours academic success, but also promotes the emotional health of students. Furthermore, the recognition of individual qualities emerges as a catalyst for enhancing students' self-esteem, giving them the freedom to innovate and ultimately contributing to the reduction of violence in the classroom.

Comparing the results, it appears that taking subjects with religious values does not significantly affect students' behaviour, while, paradoxically, despite the care provided by teachers in private institutions with religious values, children experience a certain amount of fear from their peers. Furthermore, it is observed that students from institutions with religious values exhibit good emotional health, although they tend to display more authoritarian attitudes. In contrast, students from public and secular institutions exhibit positive self-esteem, which facilitates the development of socialisation skills.

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## Social marketing, a dissemination tool in the regeneration of petunia plants (*Petunia hybrida*) from cotyledons

### Mercadotecnia social, una herramienta de divulgación en la regeneración de plantas de petunia (*Petunia hybrida*) a partir de cotiledones

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#### Abstract

This document is the result of a bibliographic review of topics pertaining to biotechnology, specifically *in vitro* culture techniques and the application of the corresponding techniques. The development presents information related to the species and genera of some mainly ornamental plants, which were worked on and of which experiments carried out are mentioned along with their satisfactory results. Within these experiments, the regeneration of *Petunia hybrida* stands out, which the authors and business advisor discovered due to its speed of regeneration and represents an interesting potential research topic. The objective of the project was to apply viable *in vitro* culture techniques to the cloning, germination and regeneration of different ornamental species, such as several of the genus *Drosera* and *Phalaenopsis*, *Petunia* and *Capsicum*, obtaining satisfactory results, so that this document serves as a disseminator of these techniques through the use of social marketing.

Social marketing, Plant cloning, *In vitro* cultivation

#### Resumen

El presente documento es resultado de una revisión bibliográfica a temas pertenecientes a la biotecnología, específicamente en las técnicas de cultivo *in vitro* y a la aplicación de las técnicas correspondientes. El desarrollo presenta información relacionada a las especies y géneros de algunas plantas principalmente ornamentales, mismas que fueron trabajadas y de las cuales se mencionan experimentos realizados junto con sus satisfactorios resultados. Dentro de estos experimentos resalta la regeneración de *Petunia hybrida*, la cual sorprendió a los autores y asesor empresarial del mismo, por su velocidad de regeneración y representa un interesante potencial tema de investigación. El objetivo del proyecto fue aplicar técnicas de cultivo *in vitro* viables a la clonación, germinación y regeneración de diferentes especies ornamentales, tales como varias del género *Drosera* y *Phalaenopsis*, *Petunia* y *Capsicum*, obteniendo resultados satisfactorios, de manera que este documento funja como divulgador de estas técnicas mediante la utilización de la mercadotecnia social.

Mercadotecnia Social, Clonación vegetal, Cultivo *in vitro*

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## Introduction

Human beings have a great capacity to adapt and transform environmental conditions to live better, even in the most adverse situations. These processes of knowledge transmission are passed on from generation to generation and constitute the main adaptation mechanism of the human species (Madariaga-Orozco and Sierra, 2000), which is why the dissemination of knowledge is considered intrinsic to the desire to share and preserve it.

In 1950, a proposal emerged in the United States to apply the principles of commercial marketing, used for the sale of goods and services, for the dissemination and acceptance of ideas and services, as well as to apply this technology to the solution of some social problems (Góngora, 2014). Programmes and campaigns focused on social marketing have been very successful based on research into the needs, beliefs and desires of the target audience and how they perceive them (Felipe and Morales, 2022).

Unlike the business sector that creates a product and then sells it, social marketing works in reverse: it starts from identifying needs, requests to promote a product that is often a new ideology or benefit resulting from behavioural change (Reyna, 2018).

The impact and capacity of social marketing is being applied with the aim of generating different behaviours. Importantly, there are still gaps that remain unexplored. Today, social marketing is extending into diverse contexts and new behaviours; which involves various actors being engaged to adopt novel technologies and different marketing theories (Quintero, Morales and Morán, 2018).

## *Petunia hybrida*

This is the scientific name for all commonly cultivated hybrids derived from crosses between *Petunia integrifolia* from Brazil and *Petunia axillaris* from Argentina, having their origin in these countries.

*Petunia hybrida* is a herbaceous, annual, perennial plant and can reach a height of 50 cm, while the lowest specimens measure approximately 15 cm. It has flowers of different colours, sizes, undulations and petal textures.

## Taxonomy

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Solanales

Family: Solanaceae

Subfamily: Petunioideae

Genus: *Petunia*

Species: *Petunia hybrida*

## Uses

As for its use, this plant is widely cultivated on terraces and balconies, and also on lawns as it has a great decorative value and is very attractive.

Its leaves are dark green, oval-shaped, alternate, elongated and entire. It is provided with single or double, funnel-shaped flowers, which can be of various colours: red, violet, blue, white, yellow, purple or shaded, which bloom from spring to autumn, so they rarely survive the winter.

There are several types of this species, which are described below:

### - Multiflorous

These are shrubby plants which develop a large number of comparatively small flowers.

### - Grandifloras

They have fewer but larger flowers which tend to be more susceptible to rain damage.

### - Nana Compacta:

These are small, uniform plants that are more resistant to bad weather and are well suited for pots and planters.

- Pendula or Surfinia

These are varieties with a pendulous and expansive habit, perfect for growing in hanging baskets or window sills, they are also widely used to cover areas of soil in the garden.

### Methodology to be developed

For this experiment, the plant material used was obtained by prior germination of seeds of the species under in vitro conditions.

To the base culture medium for this experiment, 0.4% naphthaleneacetic acid and 0.8% 6-benzylaminopurine per litre of medium were added, which was called NB 1.0 2.0.

The pair of cotyledons was removed from 32 plants of this species in a switched-on laminar flow cabinet using sterile forceps and scalpel. Subsequently, they were placed in NB 1.0 2.0 medium and the flasks were closed with their lids and placed in the respective conditions of the culture chamber.

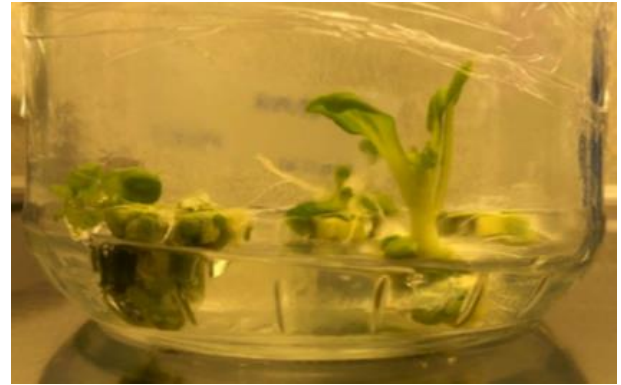
Approximately two weeks after the process described above, culture medium with lower concentrations of naphthaleneacetic acid (0.008%) and 6-benzylaminopurine (0.08%) was prepared and named NB 0.01 0.1.

After 28 days, the explants were removed from the NB 1.0 2.0 medium in a laminar flow cabinet with sterile forceps and as much as possible was removed from the NB 1.0 2.0 medium. The explants were then embedded in NB 0.01 0.1 medium, ensuring that the underside of the cotyledon was in direct contact with the medium and returned to culture chamber conditions.

The success of the experiment would be considered if the explants gave rise to shoots, and these to applicative meristems, with which, after a few days, plants would be obtained.

### Results

The first phase of the experiment lasted 28 days, starting on 27 June and ending on 25 July.



**Figure 1** Petunia cotyledon explants in NB 1.0 2.0 at 28 days

Source: Own elaboration

After this period, the second phase lasted 4 days, ending on 29 July.



**Figure 2** Petunia explant after 28 days

Source: Own elaboration

Of the total of 64 cotyledon explants required for the experiment, 64 seedlings were obtained in potential development for future cloning in culture medium and subsequent acclimatisation.





**Figure 3** Petunia explant 2 in NB 0.01 0.1 after 32 days  
Source: Own elaboration

### Concluding remarks

Petunias need a good sunny location to grow successfully. They look pitiful after heavy rain (prolonged bad weather and strong winds can cause irreparable damage), so it is best to place them in sheltered locations.

They need a lot of water, especially in summer, and even more so when in full sun, and withered leaves should be removed often, as this affects their appearance considerably.

Between June and September, a few drops of liquid fertiliser for flowering plants should be added to the irrigation water every two weeks, once the blossoms have formed (the flowers should not be wet).

The flowers wither when the autumn frosts arrive, at which time the plants are in poor condition. This is the time when they are discarded, to be replaced by new plants the following season.

Propagation of Petunias by seed should be done in March. The seeds are placed in a tray of moist compost and covered with a layer of compost. They are then placed in a propagator or wrapped in a plastic bag at a temperature of 18 to 21 °C.

When the seedlings are large enough to be handled without risk, they are transplanted into permanent containers, but at the same temperature, and finally taken outside in May or early June, when the risk of frost has passed.

### Conclusions

Social marketing is an elementary tool in the dissemination of knowledge for social purposes so that a greater number of people have the knowledge at their disposal and are able to put it into practice.

Nowadays, there are tools such as culture media and laboratories where the necessary experiments can be carried out for the reproduction of plants as alternative measures for their conservation and propagation in such a way that their existence is maintained.

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## Bibliometric analysis of safety in sport in the EBSCO Host database

### Análisis bibliométrico de la seguridad en el deporte en base de datos EBSCO Host

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#### Abstract

It is generally known that safety is paramount for every human being, there is a close relationship between the practice of sports and the risks that may arise, however, the management of them is an influential factor to reduce them, avoid them or minimize them. In this document, an extraction of bibliometric data is carried out to systematically review the research domain regarding this topic. A bibliographic search was carried out using the EBSCO Host database, a total of 294 published documents were identified, of which exact repeated publications were excluded, the final sample 225 documents were listed analyzing characteristics such as: publication modality, most productive countries, scientific journals, language, relationship with other keywords, this search was carried out between 1983 and April 15th, 2023. Based on bibliometric data, network analysis was carried out to understand the relationship between countries, keywords, language, trend through the years and authors. "Sport" and "security" and "risk management" are mainly found in publications in the United States, Australia and France. Subsequently, the text extraction of publication keywords is used to identify the relationship with other terms. In addition, recommendations are given for future research based on the results of the bibliometric analysis.

#### Resumen

Es de conocimiento general que la seguridad es primordial para todo ser humano, existiendo una relación estrecha entre la práctica deportiva y los riesgos que pueden surgir, sin embargo, la gestión de ellos es un factor que influyente para disminuirlos, evitarlos o minimizarlos. En este documento, se realiza una extracción de datos bibliométricos para revisar de manera sistemática el dominio de investigación respecto a este tema. Se realizó una búsqueda bibliográfica utilizando la base de datos EBSCO Host, se identificaron un total de 294 documentos publicados, de los cuales se excluyeron publicaciones repetidas exactas, la muestra final se enlistaron 225 documentos analizándose características tales como: modalidad de publicación, países más productivos, revistas científicas, idioma, relación con otras palabras clave, dicha búsqueda se realizó entre 1983 y el 15 de abril de 2023. En base a datos bibliométricos, el análisis de redes se llevó a cabo para comprender la relación entre países, palabras clave, idioma, tendencia a través de los años y autores. "Sport" and "security" and "risk management" se encuentran principalmente en publicaciones de Estados Unidos, Australia y Francia. Posteriormente, se utiliza la extracción de texto de palabras clave de publicación para identificar la relación con otros términos. Además, se dan recomendaciones para futuras investigaciones basadas en los resultados del análisis bibliométrico.

#### Regulations, Risks, Research productivity

#### Normativas, Riesgos, Productividad de investigación

**Citation:** ACOSTA-GONZALEZ, Ariana Linette, ZAMORA-RODRÍGUEZ, Diana Rubí, MORENO-HERNÁNDEZ, Zaid Alejandro and PADILLA URQUIDI, Victor Andres. Bibliometric analysis of safety in sport in the EBSCO Host database. ECORFAN Journal-Republic of El Salvador. 2023. 9-16:19-23.

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## Introduction

Sport has been consolidated as one of the activities that are present in people's daily lives (Latorre, 2008). According to Bentley and Page (2008), it is assumed that injuries are an inherent part of sports practice, being responsible coaches, physical trainers, doctors, physiotherapists, psychologists, etc., to ensure that sports practice is carried out in an optimal way through the application of protocols to reduce or avoid possible risks. Therefore, the proper management of pre-existing risks considering their multifactorial origin of risks, requires a multidisciplinary approach in the application of prevention protocols.

It is important to reiterate that the multifactorial origin of risks complicates the identification and search for prevention strategies. Van Mechelen in 1992, published the sequential model for injury prevention, providing new analysis criteria from the scientific perception, with the aim of achieving effectiveness and efficiency in his model, as a first step to define the magnitude of the situation or problem.

However, according to Kissler (2012), preventive actions in diseases or risks are widely documented unlike risk prevention in sports practice. On the other hand, Dallinga et al. (2012), mention that people who have had an injury due to sports practice, in addition to the suffering, economic expense, derive a side effect turning sports practice into something unpleasant.

In relation to the pyramid of human needs proposed by Maslow (1943), security occupies the second place, being the base of the pyramid the physiological needs, if this is not enough, the declaration of the third article of the United Nations (1948) mentions that: "Everyone has the right to life, liberty and security of person".

Therefore, it is important to emphasize that according to Gómez Calvo (2020), the issue of safety is a right of users and workers, therefore, the administrators of sports venues and / or entities of physical-sports activities have the legitimate duty to ensure it. The absence can imply violation of rights and infractions that imply an administrative or monetary penalty, as well as legal responsibility.

We could summarize that sport is a right and that institutions have the obligation to carry out an analysis of the different aspects related to risk management. As a result, risk can be defined as a threat, affecting the interests of sports institutions, which must be measured by its effect and the probability of its occurrence. In other words, risks can be measured by degrees.

In short, the benefits of risk forecasting in sport will serve to identify possible risks in sports practice, the purpose of which will be to reduce, eliminate or prevent risks while safeguarding the integrity of participants, spectators and workers.

On the other hand, the purpose of this article is to have a macro perspective by accepting the annual production, the geographical distribution, the leading journals, the general situation in terms of collaborative networks. Likewise, Li and Hale (2016), explain that bibliometric analysis is an art where a macroscopic perspective of a large amount of academic literature is provided by means of a quantitative analysis regarding the information of publications through the years, their characteristics and how scientific production can be mapped within a specific field.

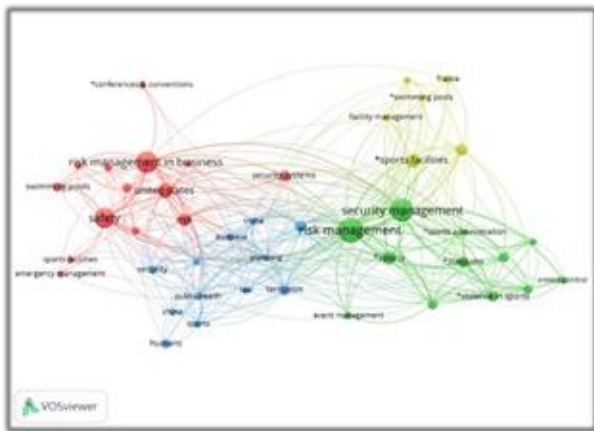
## Method

The EBSCO Host database was used to search and identify the documents. This process was carried out from 1983 to April 15, 2023 using the following search algorithm: "sport" AND "security" AND "risk management" linked to article title, abstract and keywords. Initially, 294 results were found and the following document types were recorded: academic publications, journals, professional publications, news, reports, books, reviews and e-books. Subsequently, exact repeated publications were excluded. Thus, the final sample included 225 documents, which were divided into 102 (45.3%) academic publications, 76 journals (33.7%), 23 (10.2%) professional publications, 10 (4.4%) news items, 6 (2.6%) reports, 6 (2.6%) reports, and 2 (2.6%) articles, 6 (2.6%) reports, 4 (1.7%) books, 2 (.8%) reviews and 2 (.8%) e-books.

With the extracted documents, a database was created in Microsoft Excel that included the following data: type of publication, year of publication, language, correlation of keywords, country of publication. This information made it possible to perform a descriptive analysis and to identify the countries, journals and institutions that are publishing the most on the subject.

**Results**

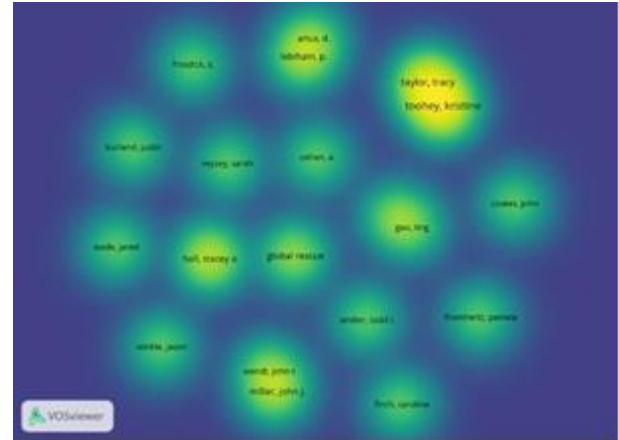
The results of the research are presented below. In Figure 1 of the analysis on the literature on security in VOSviewer software. The minimum occurrence of 5 was selected; therefore, of the 1401 keywords met this criterion consisting of 44 groups. They can be seen in different colors that group the various relationships of the concepts and in which the co-citation networks can be visualized. The size of the bubble indicates the number of occurrences and the total strength of the links to other elements/keywords. The top five keywords were "risk management", "security management", "risk management in business", "safety", "sports facilities", which occurred 66, 55, 47, 43 and 20 times, respectively.



**Figure 1** Co-occurrence analysis of keywords: "sport" AND "security" AND "risk management" of the VOS visualization software.

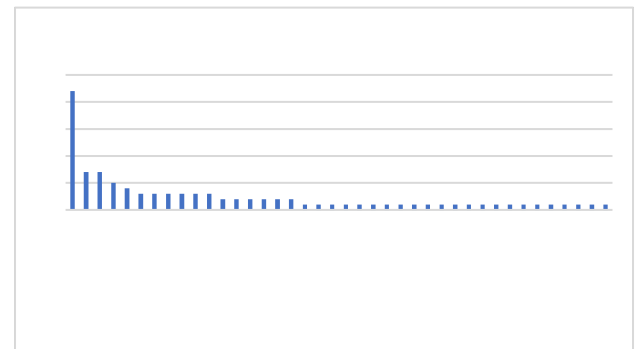
As for Figure 2, the analysis of the authorship pattern shows that, out of the 365 authors, only 20 of them have at least 2 documents and, taking this data as a reference, the total strength of the links was calculated.

the total strength of co-authorship links with other authors was calculated. of co-authorship links with other authors was calculated. The visualized density of the co-authorships with the strongest relationship. Taylor- Tracy and Toohey- Kristine with greater strength than all the others.



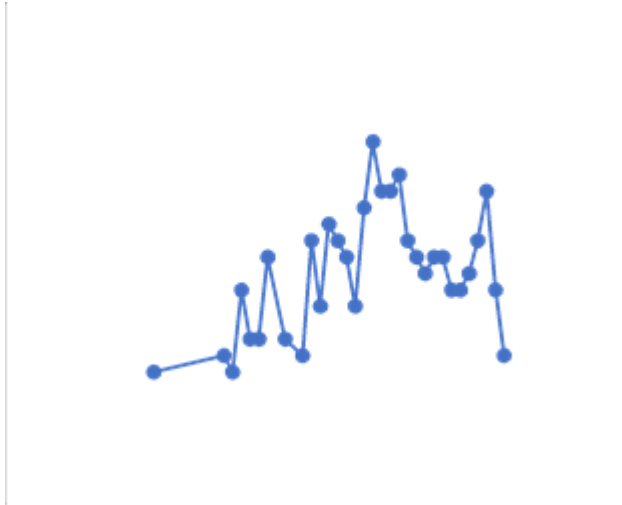
**Figure 2** Density of co-authorship of the main authors.

With respect to Table 1 indicates the countries that produced literature on the keywords worldwide. The United States tops the list with 22 publications, followed by Australia and France with 7 publications, while Spain and Poland are the countries with the fewest publications.



**Graphic 1** Number of publications by country

Figure 3 shows the trends and variations in the number of publications per year from 1983 to April 15, 2023 in the EBSCO Host database, as shown by the starting points, from 1983 to 1991, with seven years between the beginning of the period and the end of the period. 1991 passing seven years of distance between the first and second publication, however, the peak is shown in 2008-20011 with an increase in the number of publications (15-13 publications per year), then a decline occurs in 2012-2020 to 2012-2020 to 2023. a decline in 2012-2020 and then again in 2022 with an upturn in publications. publications. However, it can be observed that there is a considerable variation in the number of publications over time.



**Graphic 2** Evolution of the number of publications per year.

However, as shown in Table 1, publications related to safety in sport stand out with 45.3% being academic publications, followed by 33.7% in journals, while e-books and reviews do not add up to the total number of publications. 33.7% of publications in journals, while e-books and reviews do not add up to 2% of the publications. 2% of the publications.

Type of documents	Quantity	%
Academic publications	102	45.3
Journals	76	33.7
Professional publications	23	10.2
News	10	4.4
Reports	6	2.6
Books	4	1.7
Reviews	2	0.8
E-books	2	0.8

**Table 1** Type of publications related to safety in sport

In terms of language of publication (Table 3), 89.7% of the 225 articles are in English (n=203), well above the other languages of publication, such as French (n=13 publications; 5.7% of the total), Chinese (n=8; 3.5%), Korean (n=1; .4%), and Spanish (n=1; .4%).

Language	Quantity	%
English	203	89.7
French	13	5.7
Chinese	8	3.5
Korean	1	0.4
Spanish	1	0.4

**Table 2** Language in which the published scientific papers are available

## Conclusions

The main conclusions of this article are summarized as follows, bibliometrics is a citation visualization analysis method developed on the basis of scientometrics and data visualization, which has good analysis and prediction of research status and development trend in knowledge mapping.

As an effective tool for mapping discipline documents, bibliometrics can quantify collaborations, citations, research topics and research trends in a research field. It refers to a research method applied in library and information science that uses statistical and quantitative analysis to characterize dissertations on a particular topic, field, institution or country.

As mentioned by Fernandez (2002), bibliometrics is considered as the set of quantitative techniques applied to the analysis of documentary sets, producers and consumers, and as the tool through which the state of science and technology can be observed through the global production of scientific literature at a given level of specialization.

The United States is the country with the largest number of published papers containing the keywords: sport AND security AND risk management. The relationships analyzed by means of the keywords show how it remains a challenge to account for interdisciplinarity in a concentrated field of knowledge.

Finally, it will be interesting in future studies to perform this analysis in other databases such as Google Scholar and Dimensions and to pose a series of questions

What other variables should be cross-referenced? What is the likely future of bibliometric studies in the field of sport safety? How can they contribute to disciplinary and professional strengthening? What criticisms or problems can be raised?

Finally, bibliometric studies have been shown to be tools that contribute to the evaluation of the disciplinary field of sport safety. At the same time, they also make it possible to assess research and knowledge production trends by obtaining measurable indicators. In this way, the different studies and reports can become real supports for the elaboration and definition of policies related to psychological research, which, in fact, is beginning to be visualized in this way.

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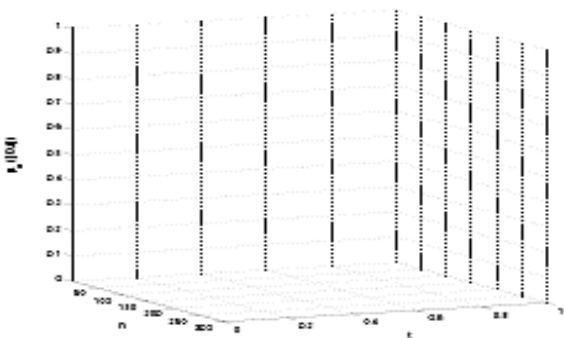
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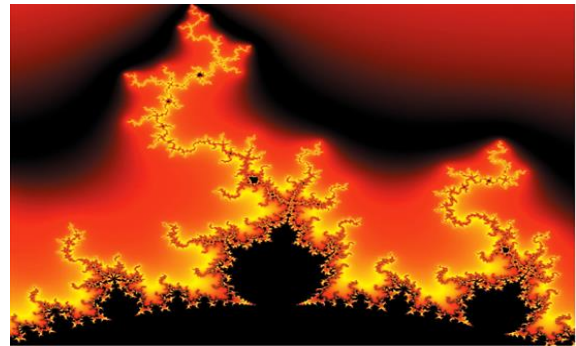
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