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The works must be unpublished and refer to topics of human talent, organizational commitment, work welfare, work performance, human resources management, human capital, productivity, organizational culture, leadership and sustainability and other topics related to Humanities and Behavioral Sciences.

Presentation of Content

In the fist article we present, *Perceived quality of sports services in private universities in México*, by MORQUECHO-SÁNCHEZ, Raquel, with adscription in the Universidad Autónoma de Nuevo León, in the netx article we present, *Integrative activity of a point of sale and the product dissemination with augmented reality*, by MORA-LUMBRERAS, Marva Angélica, SÁNCHEZ-SANCHEZ, Norma and SANCHEZ-PÉREZ Carolina Rocío, with adscription in the Universidad Autónoma de Tlaxcala, in the netx article we present, *The entrepreneur as human capital and its impact on the survival of Mypes*, by SÁNCHEZ, Mónica, ESTRADA, Xochitl, LEDESMA, Silvia and GONZÁLEZ, Miriam Fabiola, in the netx article we present, *Situational analysis of SMEs in Reynosa and Río Bravo*, by MÁRQUEZ-CHÁVEZ, Nancy Yadira, ROJAS-MONTAÑEZ, Susana, SÁNCHEZ-RAMOS, Rosalinda and VÁSQUEZ-SERRANO, Ricardo Javier, with adscription in the Universidad Tecnológica de Tamaulipas Norte.

Content

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Perceived quality of sports services in private universities in México

Calidad percibida de los servicios deportivos en universidades privadas de México

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Abstract

The quality of sports services has become a trend to ensure the continuity and progress of sports organizations. The objective of this study is to analyze the perceived quality of sports services offered by universities in the private sector of Mexico, by applying the QUNISPORT v.mx instrument to 162 users, of which 65.4% were male and 34.5% were male. % of female gender, the age range between 15 to 26 years. Among the most significant descriptive results, it was found that group sports (80.4%) are more practiced than individual sports (19.6%), in private universities. Regarding perceived quality, it was found that most users consider it necessary to have a medical service (99.4%) during the physical activity; on the other hand, in the functionality and comfort factor of the university sports areas, the item that obtained the lowest values refers to the internal communication means for the suggestions or complaints (A = 3.78, SD = 1.109), that is to say that the Users feel little heard in the follow-up of suggestions or complaints by sports organizations. In conclusion, the importance of carrying out periodic evaluations in sports organizations on the offered sports services is determined, in order to establish a philosophy of continuous improvement. As well as the formal incorporation in organization charts and manuals, a profile of a specific position and / or department of sports management within private universities, where the practice of sport and physical activity is encouraged, which will contribute to the comprehensive training of the college students.

Quality, Perception, Sports Services, University, Private Sector

Resumen

La calidad de los servicios deportivos se ha convertido en una tendencia para garantizar la continuidad y el progreso de las organizaciones deportivas. En el presente estudio se tiene como objetivo analizar la calidad percibida de los servicios deportivos ofrecidos por universidades del sector privado de México, mediante la aplicación del instrumento QUNISPORT v.mx a 162 usuarios, de los cuales el 65.4 % de género masculino y el 34.5 % de género femenino, el rango de edad entre los 15 a 26 años. Entre los resultados descriptivos mas significativos se encontró que los deportes de conjunto (80.4%) son más practicados que los deportes individuales (19.6%), en las universidades privadas. Con respecto a la calidad percibida se encontró que la mayoría de los usuarios considera necesario el contar con un servicio médico (99.4%) durante la realización de la actividad física; por otra parte en el factor de funcionalidad y confort de las áreas deportivas universitarias, el item que obtuvo valores mas bajos hace referencia a los medios de comunicación interna para las sugerencias o quejas (A=3.78, SD=1.109), es decir que los usuarios se sienten poco escuchados en el seguimiento de las sugerencias o quejas por parte de las organizaciones deportivas. Como conclusión se determina la importancia de realizar evaluaciones periódicas en las organizaciones deportivas sobre los servicios deportivos ofrecidos, con el fin de establecer una filosofía de mejora continua. Así como la incorporación formal en los organigramas y manuales de organización, un perfil de puesto y/o departamento específico de gestión deportiva dentro las universidades privadas, donde se fomente la práctica del deporte y la actividad física, lo cual contribuirá a la formación integral de los estudiantes universitarios.

Calidad, Percepción, Servicios Deportivos, Universidad, Sector Privado

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Introduction

Nowadays quality has become a necessity to guarantee the continuity and progress of organizations, generating benefits aimed at internal and external customers of the organization. The development that has taken place in recent years, the service sector, has led to quality being addressed from the point of view of quality of service, considering this construct as the greatest potential in terms of competitiveness that today can have organizations (Lloréns and Fuentes, 2000). – Therefore, sports services do not fall outside of these quality trends. In the same way Morales- – Sánchez and Gálvez-Ruiz (2011) mention that – the development experienced by the sports industry in the last decade represents one of the – most notable aspects of the current consumer – culture in sports.

The Universities in Mexico have incorporated within their objectives to promote the practice of physical activity and sports among the university and general community, as well as to create awareness of the benefits that the practice of physical activity in terms of health and quality of life (Morquecho-Sánchez, 2014). With the above, it is understood the importance of the evaluations of the perceived quality, as well as to establish standards and indicators within a sports organization directed to the continuous improvement in sports services. For these reasons, the objective of this study is to analyze the perceived quality of sports services offered by private sector universities in Mexico, one located in the north of the country in Monterrey, Nuevo León, the University of Monterrey (UDEM) and the other in the south of the country, specifically in Merida, Yucatán, the Universidad Modelo (UM).

Justificatin

A quality sports service, as well as a service in general, we can consider that it is one that meets the needs and expectations of users (Morquecho-Sánchez, 2014). One of the main characteristics of the services is that they are intangible and heterogeneous, since they are benefits and experiences rather than objects, it is difficult to establish precise specifications for their elaboration that allow to standardize their quality.

The results can not be measured, checked and verified to ensure their quality before consumption, the criteria used by consumers to assess the quality of service, is often more complex and difficult to establish accurately, contrary to what happens with the sale of any product (Morales Sánchez, 2003).

According to Gálvez (2011) the service received less the expectations created may give rise to three levels of quality:

Normal quality: received service equal to expectations created.

Superior quality: service received greater than the expectations created.

Lower quality: service received less than expectations created.

It is considered that the perceived quality of service is a lasting attitude over time, while satisfaction is a transitory judgment before a specific service. Gaboot and Hogg (1994) suggest that the consumer good would be that part of the product formed exclusively in physical properties, while the service would be related to the intangible aspects.

It should be noted that organizations must not only take into account the quality image they present to their potential customers and perceived quality of service, but they must also take care of satisfaction, since the customer's opinion of the service may be altered by a experience, satisfactory or unsatisfactory, so that their loyalty or fidelity can be affected if unsatisfactory situations occur in the specific moments of the act of consumption (Morales Sánchez, 2003). Given the development of sports management in Latin America, the application of instruments to carry out the evaluation of perceived quality in the sports services offered is suggested. The application of the instruments can be done to internal clients (company personnel, employees) or external clients (users, community in general). Therefore, it is essential to periodically assess the needs, expectations, perceptions of users of sports services, also to find out if they are satisfied with the services that complete the sports service, for example the functionality of the areas, sports communication- trainer, the administrative processes of the organization, the characteristics of the sports program, among others.

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Likewise, having reliable instruments of simple elaboration that allow organizations to apply a periodic diagnosis of the development of their services, centered on those aspects to which the user is more focused, is fundamental for management and continuous improvement according to Martínez & Balbastre (2004) and Rial, A., Rial, J., Varela, J., & Real, E (2008).

In the present investigation, it is intended to know the perception of the quality of sports services in private universities in Mexico, being this of vital importance for future strategies to be carried out in said universities with a view to the development of the quality of the sports service offered.

General Objective

Assess the perceived quality of sports services in private universities in Mexico.

Methodology Design

The study design is descriptive, with a cross section.

Sample

The sampling was by conglomerates and random, the participants are university sports users, which are regular students of the UM and the UDEM.

Participants

The participants of this study were 162 subjects of both genders, of which 106 belong to the masculine gender (65.4%) and 56 belong to the female gender (34.6%), with an age range ranging between 16 and 26 years.

Instrument

To determine the perceived quality of university sports services, the QUNISPORT v.mx instrument was used (Questionnaire for the Evaluation of Perceived Quality in University Sports Service Organizations). Morquecho-Sanchez et. to, (2016). The following is a brief description of the QUNISPORT v.mx questionnaire, which is composed of 44 items whose responses are compiled using a Likert-type scale, ranging from 1 (no agreement) to 5 (very much in agreement).

The scale is composed of 5 factors: (1) Functionality and comfort of the university sports areas; (2) Interaction with the coach; (3) Management of the sports service; (4) Characteristics of the sports activities program; (5) Environment and comfort of bathrooms / dressing rooms. It also contains a section of six sociodemographic questions; as well as a section that allows an open response in case you want to make an observation, comment or suggestion.

Process

The corresponding permits were requested to the Sports Coordinations of the participating universities for the realization of the investigation. Once the permits were granted, the following inclusion criteria were applied: the participants must be regular students, they must also belong to a representative sports team of the same university.

The questionnaire was applied once the training was completed within the sports facility individually and voluntarily; always in the presence of the interviewer. Users were told that their participation would be anonymous and disinterested for academic and research purposes.

Results

With the data obtained during the present investigation, a database was created and its descriptive analysis was carried out using the statistical package SPSS v.24.

Sports activity practiced	Frequency	Percentage
Baseball	15	9.3
Basketball	23	14.2
Futbol soccer	15	9.3
Fast football	63	38.9
Swimming	1	0.6
Pilates	14	8.6
Rugby	10	6.2
Softball	3	1.9
Yoga	15	9.3
Level of studies		
Without studies	1	0.6
High school	71	43.8
Technical career	15	9.3
Bachelor's degree	73	45.1
Others	2	1.2
Current situation		
Studies	123	75.9
Works	1	0.6
Studies and works	35	21.6
Housewife	1	0.6
Unemployed	2	1.2

Table 1 Distribution of the participants with respect to their characteristics

En la table 1 se muestra los datos descriptivos de los sujetos que participaron en el estudio. El 75.9% de la población encuestada solamente estudia y mientras que el 26.1 % estudia y trabaja. The predominant level of study was that of a bachelor's degree with 45.1%, followed by a high school with 43.8%. Sports activities with more practice is Soccer Soccer (38.9%), followed by Basketball (14.2%). The most frequent schedule for the practice of their sports activity is 2:30 pm, with an f of 44 and 27.3%; continuing with 21:00 hours with an f of 34 and 21%.

Items		Frequency *f*	Percentage %
Would you add any activity to the program of activities offered?	Sí	43	26.5%
	No	119	73.5%
Do you think that the sports facility should have a medical service?	Sí	161	99.4%
	No	1	0.6%
Do you consider the service of a sports psychologist necessary?	Sí	142	87.7%
	No	20	12.3%
Do you think it is appropriate for the facility to offer the service of a nutritionist?	Sí	159	98.1%
	No	3	1.9%

Table 2 Sports service needs

Table 2 shows 73.5% of the athletes would not add another activity to the program of activities offered by their university. 99.4% consider that the sports facility must have a medical service, while 8.77% consider the service of a sports psychologist necessary and 98.1% would consider it appropriate for the facility to offer the nutrition service.

Items	A	SD
The control of users-as, in reception, is simple.	4.08	0.991
The internal communication means to transmit suggestions and complaints are adequate.	3.78	1.109
In the case of existing a problem knows where to go.	3.87	1.070
When you have a problem, the willingness to help you from the staff of the organization is timely.	4.02	0.955
The treatment he receives from the staff of the organization is kind.	4.17	0.886
The dimensions of the sports areas where the activity is carried out are adequate.	4.41	0.760
The acoustics / sound of closed sports areas is adequate.	4.28	0.875
In closed sports areas the temperature is appropriate.	4.02	1.117
The lighting of the sports areas is correct.	3.98	1.155
In closed sports areas ventilation is correct.	3.99	1.185

Note: A = Average; SD = Standard Deviation; Min. = minimum value; Max. = maximum value

Table 3 Functionality and comfort of the university sports áreas

Table 3 shows that users attributed a lower score to the following items: the internal communication means to transmit suggestions and complaints are adequate (A = 3.78, SD = 1.109); in the case of existing a problem knows where to go (A = 3.87, SD = 1.070); and the lighting of the sports areas is correct (A = 3.98, SD = 1.155).

Items	A	SD
The sports equipment is appropriate for sports activities (baskets, goals, staves, pavements, etc.).	4.19	0.981
The sports equipment is in good condition (balls, mats, cones, etc.).	4.17	0.992
There is enough sports equipment to carry out the sporting activity.	4.18	0.971

Note: A = Average; SD = Standard Deviation; Min. =
minimum value; Max. = maximum value

Table 4 Sports service management

In the sport service management factor, table 4 shows the item as the best evaluated: the sports equipment is appropriate to carry out the sports activity (baskets, goals, staves, pavements, etc.) (A = 4.19, SD = 0.981).

Items	A	SD
The dimensions of the dressing rooms are suitable for your comfort	4.09	1.091
The accessibility of the benches is suitable for your comfort.	3.98	1.117
The size of the sprinkler area is correct.	3.92	1.205
Lockers / lockers offer security.	3.05	1.660
The bathrooms / restrooms are located outside the shower area.	4.04	1.200
The ventilation of the bathrooms is adequate.	3.56	1.323
The floor of the dressing rooms is non-slip.	3.37	1.328
The water temperature of the showers is comfortable.	3.59	1.283
The dressing room ventilation is appropriate.	3.56	1.285
The lighting of the dressing rooms is adequate.	3.75	1.176
The temperature of the changing rooms is comfortable.	3.81	1.093
The cleanliness of the dressing rooms is correct.	3.83	1.082

Note: A = Average; SD = Standard Deviation; Min. = Minimum Value; Max. = Maximum Value

Table 5 Environment and comfort of bathroom / changing rooms

Table 5 presents the environment and comfort factor of the bathroom / dressing room, the items with the highest score are: the items of the dressing rooms are suitable for your comfort (A = 4.09, SD = 1.091); bathrooms / toilets are located outside the shower area (A = 4.04, SD = 1200) and the accessibility of the benches is suitable for your comfort (A = 3.98, SD = 1.117).

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The items with the lowest score are: the lockers offer security (A = 3.05, SD = 1.660); and the floor of the locker room is non-skidding (A = 3.37, SD = 1.328).

Items	A	SD
The offer of the program of university sports activities is wide.	4.22	0.965
The cost of the sports activity is appropriate to the service you receive.	4.19	1.029
The weekly frequency of sports activities is adequate.	3.96	1.080
The schedule of sports activities offered is appropriate.	4.17	0.975
The duration of sports activities is adequate.	4.14	1.008
It has been easy to obtain information about the different university sports activities offered.	4.07	1.098
The program of sports activities is changed frequently during the season.	3.65	1.197
Sports activities take place punctually during the sports day.	3.92	1.033
The sporting activity in which he participates is in accordance with his expectations.	4.07	0.991

Note: A = Average; SD = Standard Deviation; Min. = Minimum Value; Max. = Maximum Value

Table 6 Characteristics of the sports activities program

Table 6 shows the characteristics factor of the sports activities program, the highest evaluated items are: the offer of sports activities is wide (A = 4.22, SD = 0.965); the cost of the sports activity is appropriate to the service received (A = 4.19, SD = 1.029); and the schedule of sports activities offered is appropriate (A = 4.17, SD = 0.975).

The lowest items are: the program of sports activities is changed frequently during the season (A = 3.65, SD = 1.197); sports activities are frequently changed during the season (A = 3.92, SD = 1.033); and the weekly frequency of sports activities is adequate (A = 3.96, SD = 1.080).

Items	A	SD
Communication is good between user-a and instructor-a.	4.00	1.164
The deal with the instructor is pleasant.	3.90	1.186
The instructor-a has the classes organized.	3.81	1.239
The instructor-a is concerned with adapting the sports activity to the user-a level.	3.88	1.225
The instructor-a correctly distributes the time available for the sport activity.	3.94	1.122
The instructor-a suitably uses the sports equipment available.	4.09	1.008
The instructions of the instructor-a are clear.	4.04	1.086
The instructor-a is trained to develop the sports activity.	4.02	1.120

Note: A = Average; SD = Standard Deviation; Min. = Minimum Value; Max. = Maximum Value

Table 7 Interaction with the coach

In table 7 the factor of interaction with the coach, it is observed that the item with a higher average score is the instructor used properly the sports equipment available (A = 4.09, SD = 1.008) and the item with an average lower in this factor is that of the instructor has the classes organized (A = 3.81, SD = 1,239).

Discussion

At present the universities of the country have placed emphasis on the development of athletes, this we can observe with the growth of participants in the sports competition par excellence between universities, the national university.

In the present study, the importance of the variable of perceived quality to offer a better sports service, regardless of whether it is a university, some sports event, initiation schools, etc., has been highlighted. According to Rebolloso (1999) the concern about the variable of the quality of the services with a view to continuous improvement has intensified due to four aspects, these being (1) increasing the incorporation of new clients, (2) loyalty to users / current and potential clients, (3) offer objective opportunities for improvement and organizational development, (4) optimize the relationship between cost and benefit. Within the present study we managed to find a close relationship with the third aspect mentioned by Rebolloso (1999), since we consider the management and analysis of the results of the evaluations of an objective form of utmost importance.

Seeking to carry out and establish strategies that help us improve the perception of users of sports services offered by private universities, in addition to performing this type of actions periodically following management models applied to sports.

Rial (2007) mentions the perceived quality is conditioned by a set of potential determinants, such as customer needs, image, word of mouth and marketing strategies, we must solve this by applying strategies with the Obtaining results in organizations. Since there are components that can improve, as we see in table 3 in the item "Internal media to convey suggestions and complaints are appropriate." This being the lowest of the "functionality and comfort of the university sports areas".

This seeks to operate under a management model of continuous improvement, creating a philosophy of quality within organizations, with the aim of creating a culture of management within the university sports field. Garcia (2019) mentions that knowing the reasons that lead the user to abandon a sports center, is essential to improve management and work to achieve loyalty of users enrolled in a sports center, so it is considered as a future line of research.

Conclusions

In this study, the objective of assessing the perceived quality of sports services of two private universities in the country, UM and UDEM, was raised. It is of vital importance to carry out this type of research since it is necessary to establish evaluations to be considered as strategies for improvement, as well as to create a philosophy of quality of sports service within educational institutions.

We can observe that in private universities, group sports (80.4%) are more practiced than individual sports (19.6%). This data could be used as a strategy for attracting new sports users by offering group classes of different sports modalities. Within the same order of ideas, and looking for preventive actions, a quality plan is proposed in university sports where it is suggested to create internal campaigns in universities to increase the number of users in individual sports to generate internal competition.

Another important fact is that the surveyed users are regular high school students (43.8%), which gives us a wide field of work; since there are regular high school students, to create customer loyalty strategies so as not to lose that population, the objective is for students to continue doing physical activity and sports, and at the same time, through sports practice, continue with their university studies.

Regarding the information obtained through the application of the instrument, in the second factor that is defined as needs, it was found that the majority of users consider it necessary to implement a medical service (99.4%) during the performance of the activity. physical and sports, on the other hand, the inclusion of multidisciplinary teams is also considered of utmost importance, speaking specifically of psychologists (87.7%) and nutritionists (98.1%), this with the aim of initiating a change in sports management, due It is not common to see that work with multidisciplinary teams in university sports services and could be taken as an innovation strategy in this area.

Similarly, in the functionality and comfort factor of the university sports areas, the component that obtained the lowest average refers to the internal communication means for suggestions or complaints (A = 3.78, SD = 1.109), this wants say that sports users do not feel listened to or taken into account, however with the application of instruments periodically that perception could be changed, taking into account the complaints and suggestions, giving the appropriate treatment and follow-up of complaints and suggestions from users.

On the other hand, it is necessary to analyze the factor that covers the management of the sports service, since within our research it was shown that the users perceive in a satisfactory way the existing sports infrastructure (A = 4.18, SD = 0.981), however in the factor of environment and comfort of baths became evident that the inclusion of lockers is necessary (A = 3.05, SD = 1.660).

It should be noted that within the characteristics factor of the program of sports activities it was found that the component that refers to the variability of the program of sports activities (A = 3.65, SD = 1.197) is the lowest in terms of average, so It is therefore recommended to offer a wide range of sports activities for users.

Within the same factor it was found that it is necessary to increase the weekly frequency of sports activities offered (A = 3.96, SD = 1.080) for a better sport practice. Within the interaction factor with the coach, it was found that the item that refers to the organization of the classes by the coaches (A = 3.81, SD = 1.239) is where significant results are presented with less satisfaction, the establish in an improvement plan, request the coaches a record of the planning of their classes.

In conclusion, the importance of carrying out periodic evaluations in sports organizations on the offered sports services is determined, in order to establish a philosophy of continuous improvement. Likewise, the importance of formally incorporating within the organizational charts and manuals, a profile of a specific position and / or department of sports management within private universities with the purpose of offering more and better sports services to users, is demonstrated. which will help to become aware of the benefits in terms of health and quality of life through the practice of sports and physical activity, which will contribute to the comprehensive training of university students.

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Integrative activity of a point of sale and the product dissemination with augmented reality

Actividad integradora de un punto de venta y la difusión de productos con realidad aumentada

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Abstract

An Integrative Activity uses the skills and knowledge provided in various subjects to solve practical problems, with an individual and/ or group approach. Specifically in this article we work on a Point of Sale system and the Diffusion of Products with Augmented Reality, developed over three semesters and involving courses of Software Engineering, Computer Human Interaction, Design of Virtual Environments and Computing for Mobile Devices. The activity applies knowledge of software development models, usability, 3D modeling, augmented reality and development of web applications for mobile devices. At the end of this activity, the student has managed to develop complete software, from planning until testing phases.

3D Design, Web Development, Mobile Devices, Augmented Reality

Resumen

En una Actividad Integradora se utilizan las habilidades y conocimientos desarrollados en diversas materias para la resolución de problemas prácticos, con un enfoque individual y/o grupal. Específicamente en este artículo se trabaja un sistema de Punto de Venta y la Difusión de Productos con Realidad Aumentada, el cual fue desarrollado a lo largo de tres semestres y en el que se involucran materias de Ingeniería de Software, Interacción Humano Computadora, Diseño de Ambientes Virtuales y Cómputo para Dispositivos Móviles. Para la actividad se aplican conocimientos de modelos de desarrollo de software, usabilidad, modelado 3D, Realidad Aumentada y desarrollo de aplicaciones web para dispositivos móviles. Al final de esta actividad el estudiante ha logrado desarrollar un software completo, desde las fases de planeación hasta las pruebas.

Diseño 3D, Desarrollo Web, Dispositivos Móviles, Realidad Aumentada

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Introduction

The Integrative Activity becomes the axis of the curricular integration and the contribution to the expected generic competences of the students who study a curriculum based on the Humanistic Model based on Competences (MHIC) of the Autonomous University of Tlaxcala (UAT).

The Integrative Activity implies both the formation of student work teams and collegiate groups of teachers per semester whose main purpose is the Integration of knowledge of the different Learning Units in an interdisciplinary work.

In the educational program of Computer Engineering of the UAT, it allows the development of an interdisciplinary work, due to the great variety of software development that is required, an Integrating Activity in addition to combining knowledge to solve a specific problem allows to have one more product complete, as well as having a well planned development process.

The comprehensive preparation of higher education students in the area of computing generally involves one or more Software Engineering courses, where these courses seek to cover the classic software development life cycle with the requirements analysis, design phases, construction, tests and sometimes implementation and maintenance, with the aim of instructing students in the application of good practices throughout the development process.

Although the development phases are clearly defined by the generic life cycle, not so, what set of practices should be included in a course, nor the order in which they should be introduced. The CMMi model for development defines a set of specific practices aimed at the development of software products, specifically the model at level 2 defines practices for requirements management, project planning, monitoring and control, quality assurance, measurement and analysis, configuration management and monitoring with suppliers.

This project presents an Integrative Activity that uses the knowledge developed in various learning units for the resolution of a Point of Sale system and the Diffusion of Products with Augmented Reality in which the following learning units are involved:

Software Engineering integrating CMMi model practices, Computer Human Interaction Paradigms, Design of Virtual Environments and Computing for Mobile Devices.

In section 2 three related works are presented, in section 3 the theoretical framework that covers the topics of Integrative Activity, CMMi, 3D Modeling, Augmented Reality and Usability is described, in Section 4 the Work Methodology is described, in the section 5 describes the contributions of each learning unit to the Integrative Activity project, in section 6 presents a discussion of the work done, in section 7 the acknowledgments to the work team are mentioned, in section 8 the conclusions and in section 9 the References are listed.

Related jobs

The Integrative Teaching Tasks Within the Structure of the Study Activity

In this work a study of the importance of integrative teaching tasks was carried out, they sought to highlight some regularities to facilitate the design, execution and control of tasks. Finally, they realized that the guiding character, integrative approach and systematization of the contents, systemic approach to the integrative teaching task, linking education with life, attention to diversity, group character of teaching tasks and systematic, collective character and dynamic methodological work are essential for the development of a complete work (Mass et al, 2010)

Posing Problem Situations as an Integrative Strategy in the Teaching of Science and Technology

This paper presents the results of the implementation of an interdisciplinary teaching strategy, in the technology curriculum space. It includes topics from other curricular spaces such as natural sciences (physics, chemistry and biology), mathematics and geography, from the third cycle of Basic General Education (EGB). This proposal tries to favor the integration of conceptual, procedural and attitudinal contents , taking as its axis the problem situations, whose approach and solution implies knowledge related to housing, food, energy, environmental pollution, among others (Vázquez, 2004).

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Methodological Activities for the Preparation of Human Morphophysiology Facilitators in the Development of Integrative Teaching Tasks

In this article, the proposal of a system of methodological activities aimed at improving the preparation of the Human Morphophysiology teacher for the development and application of integrative teaching tasks was set as an objective. During their development they carried out a qualitative transversal research, where the theoretical-synthetic, historical-logical, the inductive-deductive theoretical methods and the system approach were used, as well as the Expert Criteria method to validate the proposal of the methodological activities system working with a population consisting of the 10 facilitating teachers who attended the preparatory meetings that took place at the headquarters, the University of Medical Sciences. Finding as a conclusion that the development of the proposed methodological activity system can improve the preparation of teachers of Human Morphophysiology for the development of integrative teaching tasks thus achieving a better performance of their teachers (Peña et al, 2011).

Theoretical framework

Below are the topics involved in this article and that are relevant to mention: Integrative Activity, CMMi, Usability, 3D Modeling and Augmented Reality.

Integrative activity

An Integrative Activity is a system of actions that relate the skills and knowledge in the contents provided according to the objectives, not in isolation, but in harmony and well founded scientifically, which lead to greater independence and resolution in students to the problems of practice, with an individual and group approach (Pérez, 2006).

The Integrative Activity constitutes an alternative to face the challenge of the integration of the contents, to achieve it requires the cooperation of teachers and students.

CMMi

With the objective of minimizing risks in the development of projects, managing changes in requirements effectively and maintaining a quality approach meeting the expectations of customers, the CMMi-Dev level 2 maturity model is taught in the Engineering Degree. The process areas considered at this level are (CMMi, 2010), (Chrissis, 2009):

1. Requirements Management
2. Project planning
3. Project monitoring and control
4. Process and product quality assurance
5. Measurement and Analysis
6. Configuration Management
7. Monitoring of agreements with suppliers

3D modeling

3D modeling consists of sculpting 3D objects on the computer using a 3D mouse and keyboard, using 3D computer programs that handle surfaces and solids. There are many skills that a modeler must acquire and control: drawing, painting, lighting, texture application. It is difficult to find another discipline that requires such a wide range of creativity, knowledge and technical ability. (Ratner, 2005)

Augmented reality

The Augmented Reality RA allows the user to see the real world, in which virtual objects are superimposed, such as 2D animations, 3D objects, audio and / or video (Heras, 2007). Mobile devices have a great impact today, because it is very easy to run in this type of devices, Augmented Reality applications in real time, either by geographical location of the user or with markers with information stored on the device (Fombona, 2012).

Usability

Usability handles two main components: one refers to the functional aspect of the system and another to how users can use that functionality. The main factors that should be considered when talking about usability are the ease of learning, the effectiveness of use and the satisfaction with which people are able to perform their tasks when using the product, factors that rest on the foundations of the design centered on the user (Preece, 1994).

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Work methodology

Initially, it was decided to work the Integrative Activity on a Point of Sale, taking the Software Engineering Unit as an Axis Learning Unit, which is covered in three semesters and where the CMMi model is reviewed under the cascade method. During the fourth, fifth and sixth semesters of the Computer Engineering education program, the CMMi model practices are implemented to realize a Point of Sale, see Figure 1.

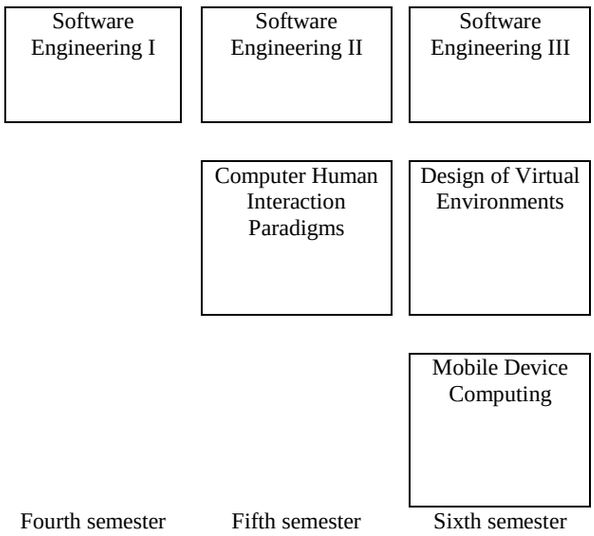

Figure 1 Learning Units considered for the Point of Sale Integrative Activity

In the Computer Human Interaction Paradigm Learning Unit seen in the fifth semester, we work with the usability of the software and a set of usability tests are carried out in order to make the software intuitive and easy to use.

During the Virtual Environments Design Learning Unit, work begins with the dissemination of the product, making 3D models of the products of the Point of Sale.

Finally, the Augmented Reality works in the Computer Learning Unit for Mobile Devices, using as markers the catalog of products of the Point of Sale, as well as the 3D models made in the Learning Unit of Design of virtual Environments.

Developing

Software Engineering

INPUT In the fourth semester the student makes a series of documents to cover the planning phases and requirements. In the fifth semester the analysis and design is carried out, including the UML diagrams that describe the logical design of the system, as well as the construction of the system aligned to the proposed design. Finally, in the sixth semester, the integration and testing, closure and implementation phases are considered.

During the fourth semester students identify an opportunity to develop a system, in this case a Point of Sale developed for a company dedicated to the sale of tourist packages is presented, where the objective of the system is to show information about destinations and packages tourism, in order to facilitate access, purchase and dissemination of trips to the different states of the Mexican Republic.

A set of specific practices of the CMMI-Dev 2 model were integrated into its requirements management process area, covering the practices of: 1. Understanding the requirements, 2. Obtaining commitment to the requirements, 3. Managing changes to the requirements, 4. Maintain bidirectional traceability of requirements 5. Ensure alignment between work products and requirements. In this case, during the development of the requirements phase, the work artifacts listed in Figure 2 are obtained, which evidenced the fulfillment of the practices

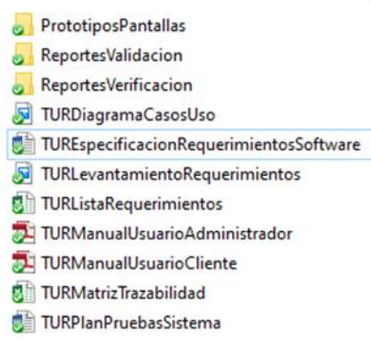

Figure 2 Artifacts developed in the requirements analysis phase

In the case of the Project Planning process area, students covered 3 specific goals with their corresponding practices:

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Goal 1. Establish estimates, involving the practices of: 1. Estimate the scope of the project, 2. Establish estimates of work product and task attributes, 3. Define the project life cycle phases, 4. Estimate effort and cost . Goal 2. Develop the project plan, in general the practices of: 1. Establish the budget and schedule, 2. Identify project risks, 3. Manage data plan, 4. Plan project resources, 5. Plan necessary skills and knowledge, 6. Plan stakeholder involvement, 7 Establish project plan. Goal 3. Obtain commitment to the plan, including the practices of: 1. Review plans that affect the project, 2. Reconcile work and resource levels, 3. Obtain commitment to the plan.

During the project planning, the Project Plan artifact is established considering the indicated practices, in Figure 2 a sample of estimation tool is added which complies with three model practices.

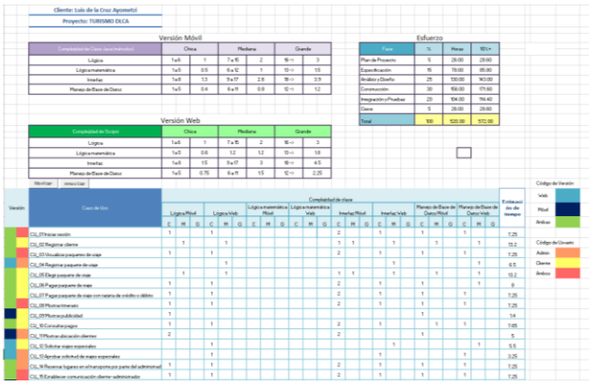

Figure 2 Project Estimate

In the course of the fifth semester the generated artifacts contemplate the analysis and logical design of the system, as shown in Figure 3. It is important to indicate that as part of the integrating activity the students obtain feedback from the Computer Human Interaction Paradigms Learning Unit and with this the analysis and design document is detailed, linking the knowledge acquired by both learning units. It is also in the construction phase where activities related to development and quality assurance activities are carried out, such as the integration of peer reviews and quality audits to the project and the process.

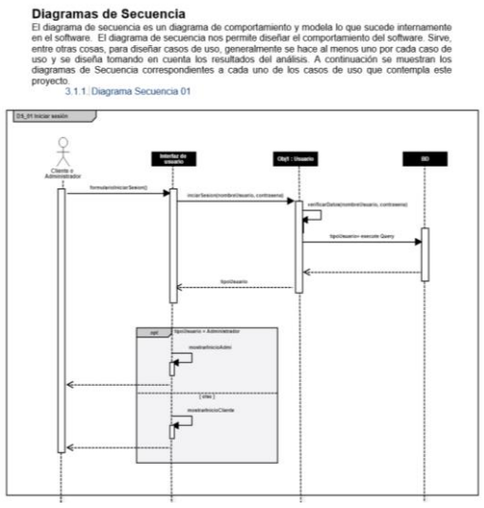

Figure 3 Artifacts generated in the design phase

Finally, in the sixth semester, the development of the system is concluded, through formal tests and the implementation of the system. Figure 4 shows part of the test plan.

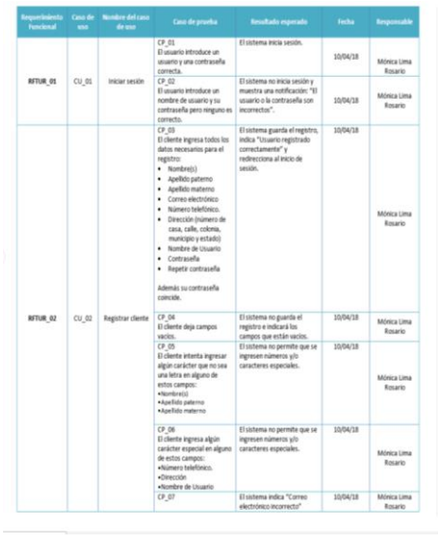

Figure 4 System test plan

It is important to indicate that in all semesters practices of quality assurance of the process and of the product, measurement and analysis, monitoring and control of the project, and configuration management were integrated; Figure 5 shows an example of the audit application to the project.

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Checklist/Informe de Auditoria de Proyecto

Nombre del Proyecto, Iteración	TURISMO DLCA
Nombre del Líder de Proyecto	Monica Lima Rosario
Etapa Actual del Proyecto	Construcción
Auditados	Nombre / Cargo: Monica Lima Rosario – Líder de Proyecto; Miriam de la Cruz Teomitzi – Analista; Leticia Gómez Rivera – Revisor; Enrique Onofre Victorero – Programador
Alcance de la Auditoria	Determinar qué aspectos requeridos cumple la documentación del Proyecto
Fecha de la Auditoria (dd/mm/aaaa)	29/10/2018
Nombre del Auditor	Brandon Jair Nava Avelar Verónica Stephany Cirio García María Fernanda Vázquez Martínez Gustavo Domínguez Santamaría

Requerimientos	Si	No	N/A	Comentarios
1. ¿Existe un documento que especifique el alcance del proyecto con el cliente?	☒	☐	☐	
2. ¿Existe una lista general de requerimientos funcionales completa y detallada?	☒	☐	☐	
3. Los requerimientos tienen una clave asignada a fin de garantizar su trazabilidad	☒	☐	☐	
4. La lista de requerimientos fue revisada y existe evidencia de esta revisión	☒	☐	☐	
5. ¿Se cumplieron las actividades de validación vinculadas a la lista de requerimientos?	☒	☐	☐	
6. ¿Existe un Documento de Especificación de Requerimientos?	☒	☐	☐	
6.1. ¿El documento de ERS está actualizado y completo?	☒	☐	☐	
6.2. ¿El documento de ERS ha sido revisado y existe evidencia de la revisión?	☒	☐	☐	
6.3. ¿Se cumplieron las actividades de validación vinculadas a la ERS?	☒	☐	☐	

Figure 5 Project Audit Report

Computer Human Interaction Paradigms

INPUT: Design and implementation of project software interfaces and usability tests.

Below is the Point of Sale developed for a company dedicated to the sale of tourist packages. The Point of Sale was divided in view of the client and the administrator, where the client is the person who is looking for a touristic tour and the administrator is a staff of the Travel Agency, owner of the software.

Figure 6 shows the main interface of the Tourism Point of Sale project.

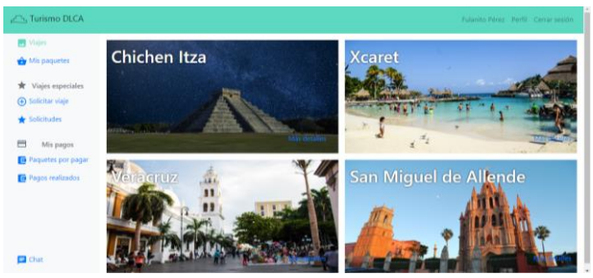

Figure 6 Main interface of the Tourism Point of Sale project

An interface for the Point of Sale administrator is shown in Figure 7

Figure 7 Point of Sale administrator interface

Figure 8 shows the interface worked for the client that seeks to make a tourist trip.

Figure 8 Client interface

Finally, usability tests were performed in the same room, as peer tests and focused on:

– Start window
– Task Orientation
– Forms
– Trust and credibility
– Content quality and writing
– Diagramming and graphic design
– Navigability

Which are complete to measure the usability of a product.

Design of Virtual Environments

INPUT: Material selection for 3D modeling, according to the Point of Sale implemented.

During the exercise of the Integrative Activity of the Tourism Point of Sale, there were problems in selecting the products of the project, because its sales product are trips, so it was decided to model products related to a trip.

Figure 9 shows a coconut with umbrella and straw, it was decided to include this object because it is one of the most characteristic on a walk to the beach.

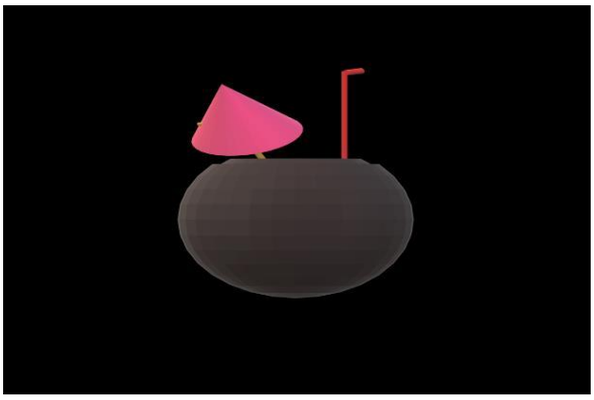

Figure 9 Coconut with umbrella

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Figure 10 shows a slide, chosen because many of the trips organized by the company usually have as a common feature the realization of aquatic activities, such as visits to the sea, or to recreational parks.

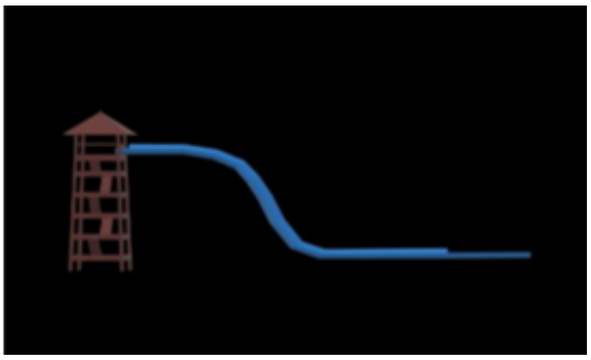

Figure 10 Slide

Figure 11 shows a pyramid, it was decided to model the pyramid of Chichen Itza because some of the tourist packages are towards this tourist destination.

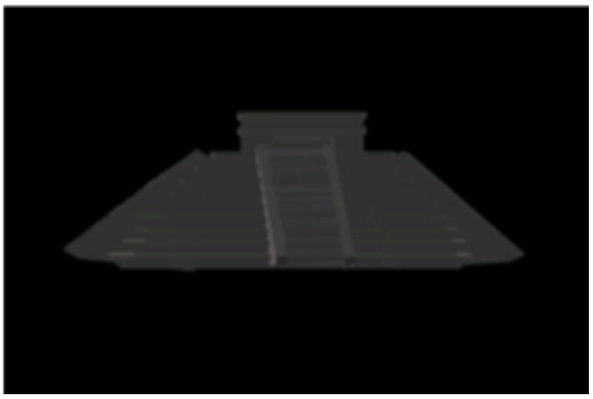

Figure 11 Pyramid

Computing for Mobile Devices

INPUT: Generate an APK for mobile devices with 3D models and markers of the Tourism Point of Sale products.

As part of the Integrative Activity, students made an Augmented Reality application for Android mobile devices using Vuforia and Unity.

On the Vuforia page, the database with the product markers was generated, for which good contrast images of the objects that were to be included in the Point of Sale product catalog were used. As shown in Figure 12.

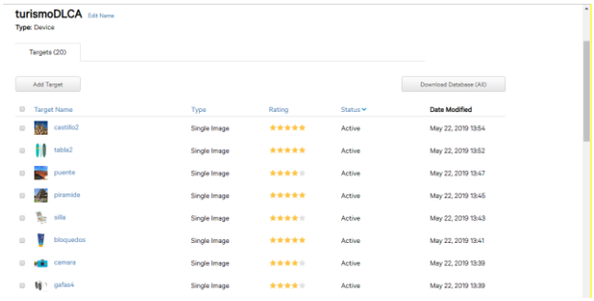

Figure 12 Database of markers in Vuforia

A project was created in Unity, where the use of Vuforia Augmented Reality was activated and the database with the markers was imported.

The next thing was to assign to each marker of the database the object created in 3D, which were modeled in the learning unit of Design of Virtual Environments. Figure 13 shows the process.

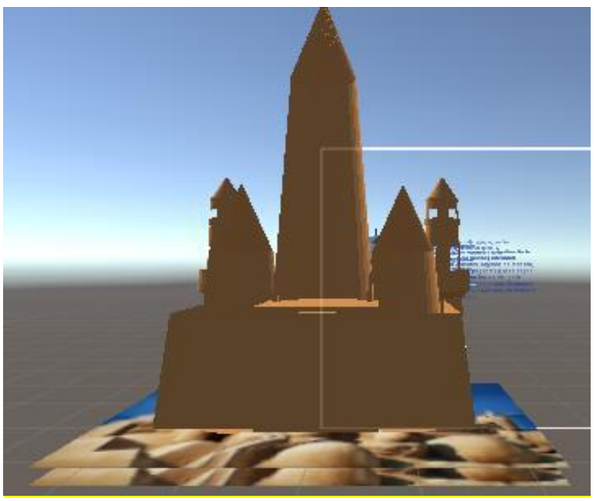

Figure 13 Object over image

A descriptive text was also added to each object, which is shown in Figure 14.

Figure 14 Descriptive text of the image

Figure 15 shows all objects related to their image and descriptive text.

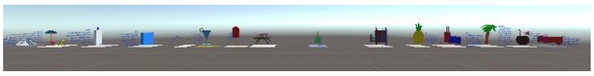

Figure 15 Objects with markers

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Finally the APK file was generated, which was installed on an Android device.

Additionally, the students made a catalog for the Augmented Reality application (Figure 16).

Figure 16 Tourism Point of Sale Catalog

The execution of the application is shown in Figure 17.

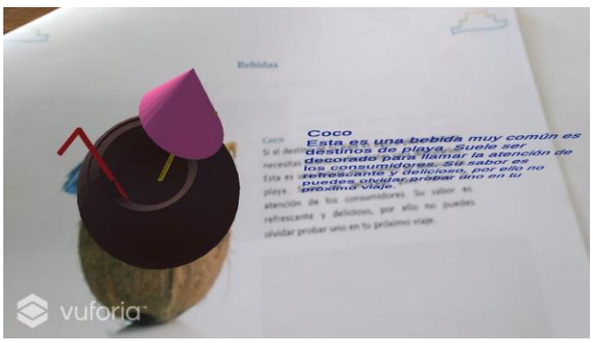

Figure 17 Augmented Reality View of a marker

Discussion

When performing for a year and a half the monitoring and implementation of the CMMi model practices, in the development of a point of sale in the educational field, it was disadvantageous that the monitoring and control activities associated with the projects are affected by the Institutional planning times, which makes timely monitoring of the project difficult, as well as the measurement of indicators associated with project planning. Even with this they were able to implement the practices of the model and verify its usefulness mainly in the testing phase. It was evidenced that the fact that the software engineering learning units functioned as an axis allowed the scope of the project not to vary and that traceability of the requirements in all the learning units was guaranteed.

During the Computer Human Interaction Paradigm Learning Unit, work was carried out according to the established planning, however, there were different controversies when requesting changes in the interface, since any change made in this learning unit should be reflected in the documentation of Software Engineering and students created some resistance to perform them, however it was satisfactorily concluded, and with this interfaces were obtained aligned to quality and design standards.

The inclusion of the Learning Unit of Design of Virtual Environments cost that will frame from the beginning, during the planning it was possible to include it with virtual worlds, but finally it was decided that the products of the Point of Sale in 3D will be modeled for dissemination, giving the possibility that the learning unit of Computing for Mobile Devices will participate with Augmented Reality.

In the Computer Learning Unit for Mobile Devices, it was determined that once the 3D product models were developed, it was most convenient to show these models through a mobile application with Augmented Reality for Android devices, and that together with a catalog that includes all the models, it would be possible to disseminate the products of the Point of Sale.

Acknowledgments

The team of Leticia Gómez Rivera, Mónica Lima Rosario, Enrique Onofre Victorero, Miriam de la Cruz Teomitzi and Cristian Salomón López Alejandro is thanked for the development of the Point of Sale for Tourism, during the exercise of the Integrative Activity.

Conclusions

During the development of the Integrative Activity, several challenges were faced, the first was to work together 6 Learning Units of the Computer Engineering career, four of them perfectly aligned, which are the three courses of Software Engineering and Interaction Paradigms Human Computer, however with two subjects it was difficult to place them from the planning, but once defined that it would work with the dissemination of the products of the Point of Sale it was believed that the problem was solved, however the Point of Sale addressed had as a tourist travel product, so it had to be coupled with products that are handled on a tourist trip.

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The entrepreneur as human capital and its impact on the survival of Mypes

El empresario como capital humano y su impacto en la supervivencia de las Mypes

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Abstract

The analysis of micro and small enterprises in Mexico (mypes) is considered as a fundamental element due to its relevance in the economy. This paper focuses its study on companies that have closed operations and seeks to identify the main factors that strengthen or weaken their growth and development, particularly considering the Director and his performance as an important factor for this to occur. Among the results found, it stands out that the skills, abilities, experience and knowledge of the director or entrepreneur contribute greatly to the success or failure of a business, but above all, it was found that there are important functions of the mypes that are not performed, what which is an internal determining factor in the closure of companies, which makes it necessary for the directors of the mypes to be trained and supported by experts to carry out their functions, in addition to establishing governmental training and accompaniment strategies to strengthen to the micro-entrepreneur

Human Capital, Mypes, Survival

Resumen

El análisis de las micro y pequeñas empresas en México (mypes) se considera como un elemento fundamental debido a su relevancia en la economía. El presente trabajo centra su estudio en las empresas que han cerrado operaciones y busca identificar los principales factores que fortalecen o debilitan su crecimiento y desarrollo, considerando particularmente al Director y su desempeño como un factor importante para que esto ocurra. Entre los resultados encontrados, destaca que las habilidades, destrezas, experiencia y conocimiento del director o empresario contribuyen en gran medida al éxito o fracaso de un negocio, pero sobre todo, se encontró que existen funciones importantes de las mypes que no se realizan, lo que es un factor interno determinante en el cierre de las empresas, lo que hace necesario que los directores de las mypes se capaciten y se apoyen de expertos para llevar a cabo sus funciones, además de que se establezcan estrategias gubernamentales de capacitación y acompañamiento para fortalecer al micro-empresario.

Capital Humano, Mypes, Supervivencia

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Introduction

The analysis of micro and small companies in Mexico (mypes) is considered as a fundamental element due to their relevance in the economy, since they make up 98.8% of the economic entities that exist in Mexico (INEGI, 2014), which have a Life expectancy at birth of 7.8 years in the country. This paper focuses its study on companies that have closed operations and seeks to identify the main factors that strengthen or weaken their growth and development.

Researchers in the economic-administrative area have established various hypotheses regarding the factors that provide the survival elements to the Mypes; According to Arias and Quiroga (2008), these factors can be classified into three groups: (a) those that are characteristic of the company, (b) those belonging to its competitive environment and (c) those associated with the employer's human capital. In this case, the aspects associated with the characteristics of the entrepreneur's human capital are considered.

Literature Review

In recent decades, studies related to the survival of mypes in various Latin American countries have intensified; In Chile, for example, Álvarez and Vergara (2007) analyzed the relationship between the size of the company and the chances of survival in companies in 25 manufacturing sectors, finding that there is high heterogeneity in the impact of the size on survival.

On the other hand, in Colombia, Arias & Quiroga (2008) analyze whether the initial size of the company influences the probability of survival of the company and concludes that large companies are more likely to survive. In their analysis carried out during the period 2000-2004 in the metropolitan area of Cali, the authors classify the factors into three groups: a) those that are characteristic of the company, b) those belonging to the competitive environment and c) those associated with Human capital of the entrepreneur. Their analysis was focused on the characteristics of the companies and their competitive environment, finding that large companies start with a 100% probability of surviving at the beginning of operations and after the fifth year they arrive with 89%, compared to mypes, which begin with approximately 92% and end the fifth year with a 53% chance of survival.

In the case of the industrial sector of Colombian mypes, Martínez (2006) performs an analysis referring to the business mobility model with passive learning proposed by Javanovic (1982) of which four relevant aspects are established: a) the size of the company and the Industry concentration seems to be positively correlated with the rate of return, b) the correlation over time of the rates of return is higher for large firms in concentrated industries, c) the variability of the rates of return increases with the concentration of the market and d) the high concentration supposes high margins for the big companies but not for the small ones, to finally validate that there is a relationship between the life cycle of the industry and the survival of the companies in the sector to which they are incorporated, being companies that enter mature markets those that have a lower survival function and those that enter sectors i Less mature industries, which have higher survival functions.

In another sense, Parra (2011) in its analysis of the variables that can be determinants on the probability of closing a company, classifies them into macroeconomic and microeconomic and concludes with respect to the size of the companies, that the probability of closing is inversely proportional to the size of these; that is, microenterprises are the most prone to premature closure. Parra himself did not find evidence on the location location as an influence on its probability of closing, but in the sense that market saturation and great competition increase the probability of bankruptcy.

On the other hand, Martínez (S.F.) analyzed the fragility of the companies through the financial analysis and mentions that the reasons for profitability and indebtedness are the main indicators that can differentiate fragile companies from non-fragile ones; in that sense, Parra (2011) states that weighing heavily on debt is more important than being highly profitable.
Peña, Aguilar & Posada (2017) in their comparative analysis of the active and inactive mypes of Mexico and Colombia classify the factors into internal and external. Within the inmates they mention financial, market and related aspects of people and administration. Regarding external factors, they consider variables such as:

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The increase in costs in suppliers, the increase in the exchange rate, the problems of insecurity and violence, the political conditions of the country, the lack of funding sources, the price increase in fuels, inflation in general and technology.

In the analysis carried out they conclude that external factors generate great concern in directors and contribute significantly to the closure of micro and small businesses.

The factors that were identified as having the greatest impact are the lack of capital, followed by insufficient income to survive. Taking up the classification carried out by Arias & Quiroga (2008), different studies related to the impact of the factors attributable to the company or its competitive environment with the probability of survival can be identified, however, those associated with the entrepreneur's human capital have have been little in-depth analysis from this approach. In this regard, Peña, Aguilar & Posada (2017) define the study variable "People and Administration" as:

It involves those items referring to aspects considered in the administrative functions of planning, management, organization and control (Chiavenato, 2000), and which are factors that when neglected or not carried out become a risk for the closure of an organization.

Linked are the aspects that consider the influence that human resources can have on the closure of a company, that people "are the ones who make the materials become goods or services that meet the specific needs of customers" (Posada , Aguilar & Peña, 2016, p.4) The problems that arise in the aspect of personnel are fundamental, since as Chiavenato (2000) points out, this is the only living and dynamic resource of the company, therefore, its quality It is largely due to the quality of its human resources, becoming a permanent factor of advantages or disadvantages (Gómez-Mejía, Blakin and Cardy, cited in Barreto, Azeglio, Cannizzaro, Lizurek, Pereyra & Uriel, 2014).
Referring to human capital Sánchez, Sánchez & Santos (2015), in their quest to analyze intellectual capital and its components, they carry out the contextualization of human capital as follows:

Human Capital consists of knowledge, skills, attitudes, ability to innovate and the experience of employees and managers to solve tasks. This knowledge is acquired through the process of education (formal and informal), socialization, recycling and updating of its activity (Rodríguez, 2012). Cañibano, Sánchez, García-Ayuso and Chaminade (2002) recognize that human capital is the knowledge that the employee takes when he leaves the company. It includes the knowledge, skills, experiences and abilities of the people who make up the organization.

Based on the above, this research seeks to answer the question: Is the Director considered as human capital of a mype an important factor that determines the closure of a company?

Methodology

This study was carried out as a collaboration in the research published in the book Factors that determine the closure of micro and small companies, Comparison between active and inactive companies in Mexico and Colombia (Peña, Aguilar & Posada, 2017). The data presented are part of an investigation conducted by the Latin American Network of Administration and Business (RELAyN) applied to mypes of Mexico and Colombia, which was carried out from a mixed approach, starting with the qualitative method, in which it was interviewed to people who had a micro or small business and who had closed in recent years, from which the categories for the instrument, quantitative non-experimental, in descriptive cross-sectional form emerge (Hernández, Fernández and Baptista, 2010).

The questionnaire was applied to the directors of the mypes located in 113 municipalities that were grouped in 74 zones. Each zone consisted of one or several municipalities that had common characteristics whose sample was determined using the following formula for finite population (Aguilar, 2005) in each of the zones:

$$n = \frac{N Z^2 \quad pq}{d^2 \ (N - 1) + Z^2 \quad pq}$$

Where:
N = population size
Z = confidence level (95%)

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p = expected probability of success (50%)
q = probability of failure (50%)
d = absolute precision level

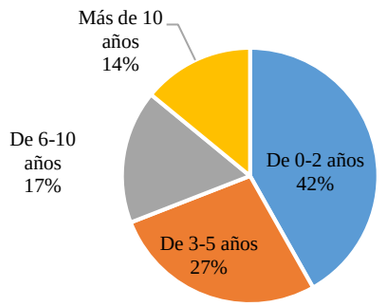
33,983 valid questionnaires were applied in person as a sum of the individual samples of the 74 zones. To validate the reliability of the instrument, Cronbach's alpha and Hotelling's square T test were applied. A sample of 33,297 companies was randomly made up of various sectors, of which 24,867 were active and 8,430 inactive companies. For the present study, the sample of 8,430 companies was taken and only the companies whose directors mentioned having been born in Mexico (question 20 of the questionnaire) were selected, finally leaving a sample of 6,418 inactive companies. The information was collected and captured from February 15 to March 31, 2017.

The analysis is based on section 6 of the questionnaire called Organizational Structure, using 15 of the 227 items that make up the RELAyN research cited above. The items analyzed are presented as affirmation, which should be assessed by the director of the participating mypes and provide a response from their point of view, using a seven-level scale where: 0 = I do not know what it refers to or did not apply to my company, 1 = No one did it, 2 = Someone outside the company did it, 3 = The director did it (sometimes with support), 4 = Anyone who was available at the time did it, 5 = A special person with several functions he did it, 6 = A special person dedicated only to that function did it and 7 = Several people dedicated only to that function did it. For the analysis of those 15 statements presented here, only the responses valued with 2 were quantified because they were functions that were not performed in the company, as well as those estimated with 3 because they are the options that allow the decisions made by the director to be assessed of the company.

Results

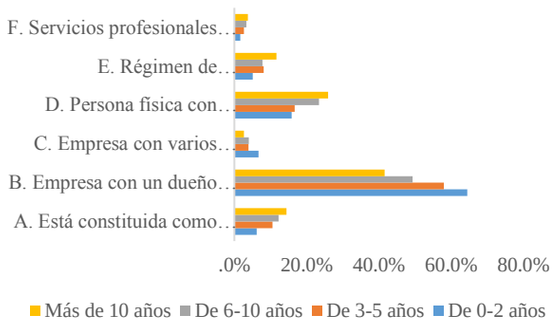
For the purposes of analyzing the information, the companies were grouped by years that lasted in operation, making four segments: from 0 to 2 years, the second segment of 3-5 years, from 6-10 years and those that managed to survive more than ten years. The information obtained shows us as a result that the average number of years a company operates in Mexico is 5.27 years, with a standard deviation of 5.84 years.

The highest percentage of companies closes in the first two years of operation (42%), as shown in the following graph, so this period is considered the most vulnerable time for Mypes in Mexico.



Graphic 1 Time the companies were active
Source: Own elaboration (2019)

The type of association that best describes the inactive companies analyzed is that they had only one owner and did not have their registration in the hacienda; in the case of companies that lived from 0-2 years, 71.2% did not have a registry, hence it is clear that there is a high percentage of mypes that started and closed without registering in the hacienda, the case is similar for companies that had the longest active life, as can be seen in graph 2, section B, which represents the highest percentage.



Graphic 2 Type of association
Source: Own elaboration (2019)

The vast majority of companies started with 5 or less workers, showing slight evidence that companies with more employees managed to survive longer.

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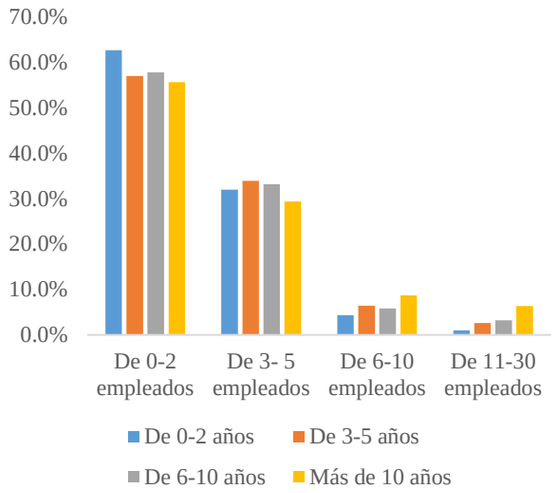
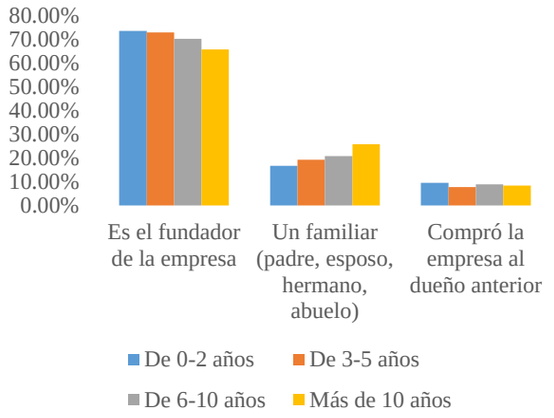


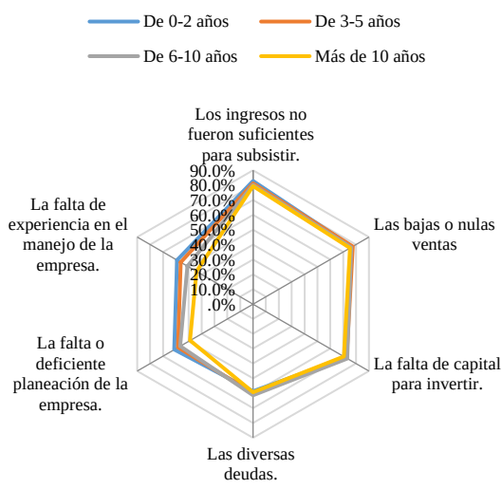
Graphic 3 Number of permanent workers at the start of the company
Source: Own Elaboration

The results obtained regarding the relationship of the director with the founder of the company reflect that 71.78% of the Mypes were initiated by the director himself, although in the companies with greater seniority in greater proportion they were established by a relative or acquired from someone known or unknown who was the previous owner.



Graphic 4 Relationship with the founder of the company
Source: Own Elaboration (2019)

Regarding the main causes that the directors or owners of the company mentioned that influenced their decision to close their business, they are without significant difference with respect to the number of years that the lack of income to survive, the losses were in operation or zero sales, lack of capital to invest and various debts; however, where a greater difference can be observed is in the aspects of experience in the management of the company and the lack or poor planning.



Graphic 5 Causes of mype closure
Source: Own Elaboration (2019)

For the analysis of these 15 statements related to the organizational structure of the mypes, only the responses valued with 2 were quantified because they were functions that were not carried out in the company, as well as those estimated with 3 because they are the options that allow to assess the decisions taken by the director of the company, finding in general terms a similarity in their behavior, regardless of the time they were in operation.

	0-2 years		3-5 years old		6-10 years old		More than 10 years	
	The director did it (sometimes with support)	Nobody did	The director did it (sometimes with support)	Nobody did	The director did it (sometimes with support)	Nobody did	The director did it (sometimes with support)	Nobody did
Human Resources (hire, pay, etc.)	31.7%	52.8%	31.8%	49.5%	32.9%	48.5%	31.4%	51.3%
Market analysis (meet customers)	25.0%	53.7%	24.7%	53.1%	26.4%	50.8%	25.3%	54.5%
Supplier Selection	50.0%	22.1%	52.7%	17.8%	52.3%	20.1%	52.8%	19.8%
Purchases	52.8%	12.0%	53.1%	9.3%	51.3%	11.9%	56.3%	10.4%
Payments	55.6%	11.6%	55.3%	8.6%	54.5%	11.6%	55.2%	10.5%
Accounting and Finance	42.5%	28.8%	40.8%	25.1%	38.4%	26.4%	35.9%	25.7%
Strategic planning (planning growth)	30.8%	49.9%	30.3%	48.4%	29.7%	47.3%	30.4%	49.2%
Plans to increase sales	33.8%	44.8%	34.1%	42.4%	34.4%	39.8%	33.0%	44.3%
Sales	35.1%	15.7%	34.5%	14.4%	34.3%	16.3%	36.6%	15.3%
Customer service (eg, handling complaints)	29.2%	28.6%	29.1%	24.7%	31.4%	25.5%	33.3%	28.6%
After Sales Service	20.4%	51.6%	21.4%	44.5%	21.4%	44.1%	22.2%	47.6%
Analyze and set prices	51.9%	18.1%	53.5%	15.8%	51.3%	16.3%	52.9%	15.7%
Promotion of products and services	33.1%	36.7%	35.4%	33.4%	32.8%	35.1%	35.1%	34.5%
Logistics and distribution (warehouse, transport)	24.4%	51.9%	25.5%	47.4%	25.5%	46.3%	26.7%	45.8%
Product improvement	35.7%	39.9%	39.3%	34.7%	36.9%	34.6%	36.8%	35.8%

Table 1 Personnel responsible for performing strategic functions
Source: Own elaboration (2019)

Discussion

In previous studies related to the causes or factors that impact the survival of mypes it has been shown that there is evidence that the size of the company at the beginning of operations is a factor that can be decisive to achieve its survival.

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In the present investigation, the microenterprises were subdivided into 3 sections to analyze their behavior, with which it was observed that the companies that started with more than 5 workers had more active life time; However, there is not enough certainty to affirm that the greater the size of the company at the beginning of operations decreases the risk of closing.

When questioning the directors of the mypes in Mexico, they refer to the cause of the closure of their company that the income was not sufficient to subsist as well as the various debts acquired, which coincides with the revised literature, since this is mentioned on financial aspects of profitability and indebtedness as the main indicators of vulnerability in the mypes.

Another factor mentioned by the directors or owners of the mypes, were the low or zero sales and the lack or deficient planning in the company, in the latter with percentage variations with respect to the years that the company was active. When analyzing the person responsible for performing these functions in the company, it was possible to identify that on average 43.3% of the mypes do not make plans to increase sales nor did they have people assigned to perform this function and 33.8% of the directors of the mypes They refer to them making those decisions. Similarly, 49% do not carry out strategic planning focused on the growth of their business and only 30.4% of the directors performed this function.

Conclusions

The search for information and analysis related to mypes is significant in recent decades due to their relevance in the country's economy. In that sense, clearly identifying the causes of closure of Mexican mypes allows us to highlight the main challenges that entrepreneurs in our country face every day, being attentive to their environment to make decisions that defend and strengthen their business , analyze the market and administration aspects with the purpose of identifying the factors that could affect their sales or financial indicators, as well as the external environment that significantly influences the closing of the mypes in Mexico.

With respect to the research question, is the Director considered as human capital of a mype an important factor that determines the closure of a company? it is evident that the skills, abilities, experience and knowledge of the director or entrepreneur contribute to the success or failure of a business, but above all, there are important functions of the mypes that every entrepreneur must know and not lose sight of in order to assign the necessary personnel to support it On the other hand, it is also important that government training and accompaniment strategies be established to strengthen the micro-entrepreneur, as well as to emphasize future managers or entrepreneurs of the importance of developing their knowledge and skills which will directly influence the company and through it in the economy of our country.

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Situational analysis of SMEs in Reynosa and Río Bravo

Análisis situacional de las MSMEs en Reynosa y Río Bravo

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Abstract

This research attempted to detect factors that are avoiding business success of micro, small and medium enterprises (MIPyMES) in Reynosa and Rio Bravo, Tamaulipas, Mexico. The purpose of this analysis is to provide a business plan to the entrepreneurs based on their strengths, weaknesses, opportunities and threats which uncover their inner business administration. The study examined 81 private MIPyMES, which showed 46 strength variables, 26 opportunity variables, 30 weakness variables and 30 threat variables. The business plan provided can hence and increase their strengths and reduce the risk of uncertain decisions.

Business plan, Strength, Weakness, Opportunity and threat

Resumen

Esta investigación intentó detectar factores que evitan el éxito empresarial de las micro, pequeñas y medianas empresas (MIPyMES) en Reynosa y Río Bravo, Tamaulipas, México. El propósito de este análisis es proporcionar un plan de negocios a los empresarios basado en sus fortalezas, debilidades, oportunidades y amenazas que descubren su administración comercial interna. El estudio examinó 81 MIPyMES privados, que mostraron 46 variables de fortaleza, 26 variables de oportunidad, 30 variables de debilidad y 30 variables de amenaza. El plan de negocios proporcionado puede, por lo tanto, aumentar sus fortalezas y reducir el riesgo de decisiones inciertas.

Plan de negocio, Fortaleza, Febilidad, Oportunidad y Amenaza

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Objective

Apply the SWOT diagnostic tool to know in a representative way the situation of micro, small and medium enterprises and the factors that limit their growth and economic development during the months May-December 2018, divided into two periods in the cities of Reynosa and Rio Bravo from the state of Tamaulipas, with the purpose of supporting entrepreneurs in the region with a business plan that allows them to efficiently manage their resources.

Hypothesis

Most companies, particularly in the region, consider that their areas of opportunity are due to a lack of resources, when in reality MSMEs are not even able to clearly identify their weaknesses and threats due to lack of training and consultancy. Even before the company receives the financing, it is necessary to assess what it wants to apply the resource and how it intends to do so.

Justification

a. **Practical value**:

Microentrepreneurs in the region lack knowledge of strategic planning that allows them to identify their areas of opportunity to generate strategies and obtain more profits to ensure that their life time is prolonged. Neither companies solve their problems with more money nor can they consolidate their position. An alternative is to grow with financing, first, to ensure that there will be an environment that significantly reduces as much as possible, factors that can be adverse to it. Even with the support of the Development Bank, financing, even with soft rates, there is a risk of default. Recent experiences in other parts of the world, and even in Mexico, indicate that financing must be covered with services that take away risks from companies. Without enough "clothing", MSMEs are more likely to complicate their situation rather than resolve it. At a very high percentage, studies carried out in the country by academic organizations (Tecnológico de Monterrey, Universidad de las Américas cite two examples) indicate that MSMEs are not even able to distinguish clearly what their problems or areas of opportunity are.

This article will help to know the current situation of MSMEs to design strategies, implement corrective or preventive actions, as the case may be, that strengthen their growth and contribute to job creation, economic development and participation in binational trade. considering the geographical location. With this in a representative way the Region, the State and the Country benefit.

b. ***Theoretical value***:

This article helps to understand the reasons for the decrease in MSMEs in the region in recent years, which are the speed of growth and scalability, the need for low interest credit, difficulty in developing strategic plans and executing them, shortage of investment in technology and talent, among others (Arana, 2018)

c. The methodological value:

It helps to create analysis on MSMEs to detect their business situation and how they are facing the new challenges for their growth, with the objective of defining the factors that slow their development and can generate solution strategies that allow them to prepare for new scenarios and acquire knowledge and experiences.

Theoretical framework

Since the last decade he has referred to different economic scenarios in which emerging countries, developing countries and major economic powers participate, both in Latin America and in the rest of the world have changed trade challenges as a result of globalization, of agreement with Hernández (2007) China could become the world's first economy by 2020, which allows us to reflect on why Mexico, although it is located in a strategic geographical position with departures to the Atlantic and Pacific and a series of trade agreements with different countries; Why the slow growth of MSMEs?

There are many variables that may be interacting against MSMEs in our country and that do not have the expected growth and development. In Reynosa life expectancy is 5.9 years according to INEGI. (INEGI, 2016). Among the most visualized features presented by these companies are the following:

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1. Serve a limited market or, within a wider market, a small number of customers.
2. The size of these companies corresponds to the production program of each of them and to the ability of the entrepreneurs to manage it.
3. Manufacture products, with a tendency to some specialization and use simple manufacturing processes.
4. Have limited financial means.
5. Its production equipment and machinery are simple.
6. Have reduced staff.
7. Use easily accessible local raw materials, not always conservable, or semi-finished.
8. Entrepreneurs personally cooperate in production, supervise it directly, or direct it through a small number of supervisors.
9. Entrepreneurs personally supervise the sales of their products.
10. Its accounting and control systems are simple.

According to Victor Manuel López Ayala the following characteristics are found:

a) Lack of trained personnel, since the owner does everything or thinks he has the knowledge to do it, such as the use and management of inventories, purchases, sales that are normally recorded by hand; Normally in MSMEs it is the lack of knowledge since there is a resistance to change, to the use of new technologies that facilitate transactions.

b) Lack of technology Normally the owner of an SME believes that he can do everything manually and even lacks technology (hardware and software) that makes his administration efficient and therefore we not only see the MSMEs as a resistance to change, but rather we can see it as an economic aspect since, from a general perspective, MSMEs do not have enough capital to invest in technological tools. It is there where the entrepreneur can go to the government to request financial support and expand the business.

c) Proper Accounting, since SMEs or their caretaker says that he keeps accounting as his parents do or as his grandparents did that even in a notebook they only have their entrances and exits, however, we can find that the technologies do not they only serve us to chat but we can use software, which allow us or facilitate accounting operations, without having to use an accountant.

d) Lack of distribution of their goods and services, since they encounter the problem that transport can cause them great costs and their products become more expensive, making them less competitive with the large companies that today have a distribution system automated and that makes the costs lower, as well as the prices of the products we can use, in this sense we can consider that in SMEs we can not only make customers go to SMEs to be able to obtain the service they offer, today in day with the growth of social networks, there may be other forms of marketing such as through digital platforms, or even through Networking, since we can use these means so that products can be delivered to customers. (Ayala, 2018)

El impacto de la globalización en las SMEs.

Globalization, the administration or valuation of knowledge and the permanent change of context, force us to change our paradigms. In the administration it is not the exception, since one of the most important challenges is human resources since in a globalized world it is based on the premise that man is highly substitutable in the gear of the company, leaving behind the importance or Essential Human Development for the achievement of an organization.

One of the challenges when using the terms of human resources, people are categorized as a means to achieve a specific goal, without taking into account that this must be the most important capital of our organization, since it has characteristics that will allow oxygenate it (Chiavenato, 2017).

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The Human Resources Department, as it is currently understood, is that in some companies the human capital department is a relatively new concept that does not emerge completely until the mid-2000s; its appearance is not really more than the result of a progressive transformation of the personnel function, which has been influenced by the development in thinking about people and organizations during the second half of the twentieth century (Aragon, 2017). (Ayala, 2018)

Presentation of the proposal with their respective results

Based on the SWOT diagnostic tool, 81 MSMEs were analyzed to know their strengths, opportunities, weaknesses and threats from the municipalities of Reynosa and Río Bravo. The data collected are shown in tables 1 to 4.

As well as, the 5 variables that represent the most impact are shown in 8 graphs.

They are detailed in 2 periods of May-August 2018 with 34 companies and September-December 2018 with 47 companies.

In the strengths, 46 variables shown in table 1 were detected.

The 5 variables with the most impact in both periods are detailed below:

From the May-August 2018 period they are:

a) Quality products and / or services,
b) Excellent service,
c) Adequate facilities,
d) Accessible prices,
e) Good ubication.

See graphic 1. From the September-December 2018 period they are:

a) Excellent service,
b) Quality products and / or services,
c) Good ubication,
d) Accessible prices and
e) Schedule availability.

See graphic 2.

These strengths are what allow MSMEs to survive the challenges of their limitations.

The following table lists the 46 strength variables that were detected in the analysis.

1	Excellent service
2	Quality products and / or services
3	Accessible prices
4	Good ubication
5	Variety of products and / or services available
6	Adequate facilities
7	Schedule availability
8	Trained staff
9	Experience with products and / or services
10	Good working environment
11	Market knowledge
12	Good administration
13	Own premises
14	Product promotions
15	Committed and / or motivated staff. Teamwork
16	Adequate technology
17	Quality raw material AND / or quality tool.
18	Home service
19	Internet pages (eg Facebook page), for advertising
20	It has advertising campaigns
21	Basic product in the basic basket
22	Family business
23	Product innovation
24	Customer Loyalty
25	Provide customized products
26	Sales and purchases on credit
27	Fast service
28	Prestige
29	Safety equipment
30	Enough human capital
31	Customer Security
32	Trusted suppliers
33	Wholesale and retail prices
34	There is no exclusivity with suppliers
35	There is NO near competition
36	Internet for customers
37	Free freight
38	Excellent inventory control
39	Immediate product availability
40	Original Designs
41	It has a bank terminal
42	Home Charges
43	Client Portfolio
44	Distribution Channel Supermarkets
45	Good image
46	Wide profit margin

Table 1 Variables detected in strengths

In Opportunities 26 variables were detected that are shown in table 2.

The 5 variables with the most impact in both periods are detailed below:

From the period May-August 2018:

a) Market,
b) Faithful clients,
c) Demand for the product or service,
d) Suppliers,
e) Government support.

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See graphic 3.

From the period September-December 2018:

a) Market,
b) Seasonal sales,
c) Faithful clients,
d) New tendencies,
e) Demand.

See graphic 4.

Las opportunities that were detected serve as a basis for MSMEs, seek training and consulting and are able to meet the demand by obtaining loyal customers. The following table lists the 26 opportunity variables that were detected in the analysis.

1	Market
2	Faithful clients
3	Demand
4	Suppliers
5	Government support
6	Financing
7	Technology
8	Temporary sales
9	Weak competition
10	Trend
11	New products
12	Growth of prestige
13	No competition
14	Positioning
15	Foreign customers
16	Expansion abroad
17	Expansion in national territory
18	Variety of brands-products
19	Technological advances
20	Opening of a new branch
21	Total coverage
22	Location
23	Different types of business contracts
24	Easy access to the public
25	Public campaigns
26	Customer Increase

Table 2 Variables detected in opportunities

En Regarding weaknesses, 30 variables were detected, which are shown in Table 3.

The 5 variables with the most impact in both periods are detailed below.:

a) From the May-August 2018 period:
b) Bad business location,
c) Lack of publicity,
d) Bad organization of the company,
e) Local reduced and
f) Lack of parking.

See graphic 5.

From the period September-December 2018:

a) Lack of publicity,
b) Little personal,
c) Bad organization of the company,
d) Small premises,
e) Lack of maintenance and obsolete facilities.

See graphic 6.

The lack of knowledge about strategic planning is a consequence of the bad organization of the company that leads to the lack of strategies to correct the weaknesses. The following table lists the 30 variables of the weaknesses that were detected in the analysis.

1	Lack of Advertising
2	Little personal
3	Bad organization of the company
4	Reduced Local
5	Lack of Maintenance and obsolete facilities
6	Lack of parking
7	Bad Organization of the Times
8	Little variety of Products or Services and of poor quality.
9	Lack of Training and ignorance of the branch
10	Non motivated staff
11	Bad business location
12	Misuse of facilities and lack of hygiene.
13	Collection terminal is missing
14	Lack of Technology applied to business
15	Shortage of merchandise
16	Missing Security team for employees
17	Little experience in the field
18	Lack of budget
19	There is no credit plan.
20	Lack of Furniture
21	No home delivery service
22	They do not have their own premises
23	Bad Work Environment
24	There is no innovation
25	Little clientele
26	Low salaries
27	Lack of Business Protection Insurance
28	Lack of delivery vehicles
29	The employees do not have social security.
30	They are not registered in the SAT

Table 3 Variables detected in weaknesses

In the Threats quadrant 36 variables were detected, they are shown in table 4.

The 5 variables with the most impact in both periods are detailed below..

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a) From the May-August 2018 period:
b) A lot of competition,
c) Unsafety,
d) Weather,
e) Price increase,
f) Damage to city streets.

See graphic 7.

From the period September-December 2018:

a) A lot of competition,
b) Unsafety,
c) Increase in raw material prices,
d) Damage to city streets and
e) Weather.

See graphic 8.

These threats reflect the lack of a situational diagnosis that PEST analysis (political, economic, social, technological) can help to know the external factors that weaken MSMEs. The following table lists the 36 threat variables that were detected in the analysis.

1	A lot of competition
2	Unsafety
3	Weather
4	Price increase
5	Damage to city streets
6	seasons
7	Lack of suppliers
8	Taxes - increase
9	Negative publicity
10	Market Ignorance
11	Similar products
12	Loss of clients
13	Devaluation
14	Work accidents
15	Internet sales
16	Franchises
17	Customer Mistrust
18	Pests
19	Noisy neighbors
20	Expiration
21	Equipment abuse by the client
22	Dissatisfied customers
23	Youth - inexperience
24	Inflation
25	Obstruction in ads
26	Without licenses - legal problems
27	Lack of vigilance
28	Home service
29	Poor quality production
30	Beginning of the school year
31	Misunderstanding of companies
32	Threats
33	There is no product culture
34	Import and export restrictions
35	Product transfer for delivery
36	holidays

Table 4 Variables detected in threats

Once the needs of microentrepreneurs have been detected, the Educational Institution provides participatory advice with teachers and students to microentrepreneurs in the cities of Reynosa and Rio Bravo on basic issues such as accounting, marketing and administration to make material, human and financial resources efficient.

In addition, teachers and students carry out a Business Plan for a certain number of microentrepreneurs and they provide the necessary information to prepare it..

Business plans	
May-August 2018	34
September-December 2018	47

Table 5 Cantidad de planes de negocio

Finally, a "Guidance and Advice for your business" Forum is held where Government Dependencies and Banking and Financial Institutions and entrepreneurs are invited to transmit their experience.

Some participating units are:

– HIS SIGN
– TAMAULIPAS FUND
– BANK INSTITUTIONS.
– CANACINTRA
– SECRETARIAT OF ECONOMY
– CANACO
– COPARMEX

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What is your added value with respect to other techniques?

Clearly focus each of its features

Clearly explain the problem to be solved and the central hypothesis.

Explanation of sections Article.

Development of headings and subheadings of the article with subsequent numbers

[Title No.12 in Times New Roman, single spaced and bold]

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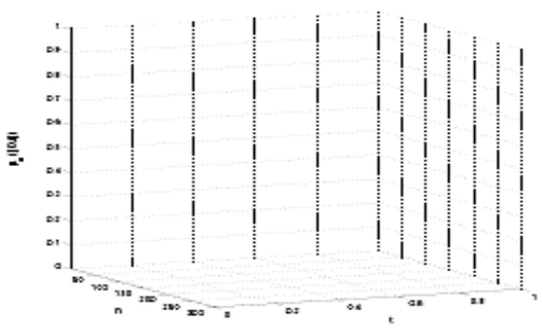

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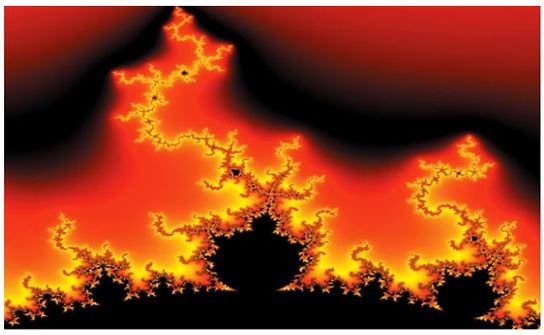

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