Volume 5, Issue 9 – July – December – 2021

Journal-Business Administration-Marketing; Accounting

ISSN-On line 2531-3002

RINOE®

Journal-Business Administration-Marketing; Accounting, Volume 5, Issue 9, July-December 2021, is a journal edited semestral by RINOE. Agueinit # 4, Wilaya de Awserd, Sahara Occidental, Western Sahara. WEB: www.rinoe.org journal@rinoe.org. Editor in Chief: VARGAS-DELGADO, Oscar. PhD. ISSN 2531-3002. Responsible for the latest update of this number RINOE Computer Unit. ESCAMILLA-BOUCHÁN, Imelda, LUNA-SOTO, Vladimir. PhD. Agueinit # 4, Wilaya de Awserd, Sahara Occidental, Western Sahara, last updated December 31, 2021.

Journal-Business Administration -Marketing; Accounting

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Support the international scientific community in its written production Science, Technology and Innovation in the Field of Social Sciences, in Subdisciplines of Business administration: Production management, Personnel management, Entrepreneurship, Corporate culture, Social responsibility; Business economics; Marketing and advertising; Accounting and Auditing; Personnel economics: Firm employment decisions, Promotions, Compensation and Compensation methods and their effects, Training, Labor management, Labor contracting: Outsourcing, Franchising.

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Presentation of the content

In the first article we present, *Study of measurement and improvement of productivity in the sector of cocoa processing companies, in the state of Tabasco, for the development of an improvement proposal*, by CORNEJO-BARRERA, Alejandra, ELISEO-DANTÉS, Hortensia, LÓPEZ-VALDIVIESO, Leticia and PERÉZ-PERÉZ, Iris Cristel, with adscription in the Instituto Tecnológico Nacional de México, Villahermosa Campus, in the next article we present, *Mathematics: the attitude, taste and performance in this subject of the students of the bachelor's degree in Administration and Management of Small and Medium Enterprises of the Universidad Politécnica de Pénjamo*, by ARROYO, Ignacio, CORONADO, Janet del Carmen and VÁZQUEZ, Glafira, with adscription in the Universidad Politécnica de Pénjamo, in the next article we present, *Positioning Sucre as a tourist destination*, by FERNÁNDEZ, José, ESPADA, Gisela and ESPADA, Olga, with adscription in the Universidad Mayor Real y Pontificia de San Francisco Xavier de Chuquisaca, in the last article we present, *Quantitative methodology and mobile technology to evaluate the quality in use of projects-products-services in innovation events through metrics*, by VARGAS, Laura, GUTIERREZ, Agustín, EDGARDO, Felipe, VARGAS, Vanessa and PERALTA, Jorge, with adscription in the Instituto Tecnológico de Ciudad Madero, Instituto Tecnológico y de Estudios Superiores de Monterrey, Instituto Politécnico Nacional and Universidad Autónoma de Tamaulipas.

Content

Article **Journal- Business Administration - Marketing; Accounting**
December 2021, Vol.5 No.9 1-6

Study of measurement and improvement of productivity in the sector of cocoa processing companies, in the state of Tabasco, for the development of an improvement proposal

Estudio de medición y mejoramiento de la productividad en el sector de las empresas procesadoras de cacao, en el estado de Tabasco, para el desarrollo de una propuesta de mejora

CORNEJO-BARRERA, Alejandra†*, ELISEO-DANTÉS, Hortensia, LÓPEZ-VALDIVIESO, Leticia and PERÉZ-PERÉZ, Iris Cristel

Instituto Tecnológico Nacional de México, Villahermosa Campus, Mexico

ID 1st Author: *Alejandra, Cornejo-Barrera* / **ORC ID:** 0000-0001-6700-3159, **Researcher ID Thomson:** AAT-1171-2021, **CVU CONACYT ID**: 1003685

ID 1st Co-author: *Hortensia, Eliseo-Dantés* / **ORC ID:** 0000-0003-4006-4669, **Researcher ID Thomson:** F-6749-2018, **PubMed Autor ID:** 6eb3adfd69824484b018f668c2670f109f08, CVU **CONACYT ID:** 411079

ID 2nd Co-author: *Leticia, López-Valdivieso* / **ORC ID:** 0000-0001-6288-3636, **Researcher ID Thomson:** G-5753-2018, **PubMed Autor ID:** 88b3c7591c5b9c66b8657c78d9f44d708 **CVU CONACYT ID:** 67839

ID 3rd Co-author: *Iris Cristel, Peréz-Peréz* / **ORC ID:** 0000-0003-3120-5597, **Researcher ID Thomson:** G-1891-2018, **PubMed Autor ID:** 4153742f278c38045ef7e6c0e83c476d4208, **CVU CONACYT ID:** 843577

DOI: 10.35429/JBAB.2021.9.5.1.6 Received: July 10, 2021; Accepted: December 30, 2021

Abstract

Objective: To carry out a study of the measurement and improvement of productivity in the sector of companies dedicated to the processing of cocoa. Methodology: As a first point for the study and collection of data, it is important to know the structure of the companies, that is, if they are divided by departments and / or processes, to proceed to make the selection of the sample. Following this, the instrument called the Comprehensive Productivity Assessment Technique (TIEP) will be applied. With the results obtained, we will proceed to the elaboration of the composite and simple average graphs, which will give us an overview of the current situation of the organizations and thus be able to identify the areas of opportunities. Contribution: With the results obtained, a model for measuring and improving productivity will be developed, so that organizations in this sector increase their productivity, which in turn will allow them to be more competitive in the market that they are positioned

Measurement, Productivity, Cocoa

Resumen

Objetivo: Realizar un estudio de la medición y mejoramiento de la productividad en el sector de las empresas dedicadas al procesamiento del cacao. Metodología: Como primer punto para el estudio y levantamiento de datos, es importante el conocimiento de la estructura de las empresas es decir si están divididas por departamentos y/o procesos, para proceder a realizar la selección de la muestra. Seguido de ello se procederá a la aplicación del instrumento llamado Técnica Integral de Evaluación de la Productividad (TIEP). Con los resultados obtenidos se procederá a la elaboración de los gráficos de promedio compuesto y simple, lo cuales nos darán un panorama de la situación actual de las organizaciones y así poder identificar las áreas de oportunidades. Contribución: Con los resultados obtenidos se elaborará un modelo de medición y mejoramiento de la productividad, para que las organizaciones de este sector aumenten su productividad lo que a su vez permitirá que sean más competitivas en el mercado que estén posicionados.

Medición, Productividad, Cacao

Citation: CORNEJO-BARRERA, Alejandra, ELISEO-DANTÉS, Hortensia, LÓPEZ-VALDIVIESO, Leticia and PERÉZ-PERÉZ, Iris Cristel. Study of measurement and improvement of productivity in the sector of cocoa processing companies, in the state of Tabasco, for the development of an improvement proposal. Journal-Business Administration-Marketing; Accounting. 2021. 5-9:1-6.

* Correspondence to Author (Email: alejandra_barrera13@hotmail.com)
† Researcher contributing as first author.

Introduction

The measurement and improvement of productivity is a process of utmost importance, because there is always something to improve or correct so that the processes continue to continue in a better way. Measurement and improvement will allow us to improve weaknesses and strengthen those strengths that we already have, but in what benefits this, because it will help organizations to be competitive and above all productive in the market in which they are, obtaining results in a visible way like, costs, expenses, time, these are items of utmost importance.

The measurement and improvement of productivity will allow organizations to visualize a broader horizon, since it allows the participation of all areas of a production chain, which will help train leaders, in the same way it will help to obtain what every organization wants. possessing that is productivity, but how this was carried out in the union of effectiveness and efficiency, but for this, a comprehensive systemic approach must be taken, that is, to see the organization as a whole, analyzing internal and external factors, not leaving any element out, since all have a degree of importance and a reason for being.

Problematic

Nowadays the variables of the context have an unstable behavior, that is, changes are presented in an accelerated and unexpected way, therefore it is of the utmost importance that organizations are prepared for these modifications, and thus be able to find solutions that will allow facing the changes presented by the contexts, a clear example of today is the Covid 19 pandemic.This event led to the context variables presenting unexpected changes which many organizations were not prepared for, but over time they have found strategies to adapt to new contexts and be able to continue in the market in a feasible way, fulfilling the new requirements that its clients demand.

Companies limit themselves when considering their goals, they do not visualize that they can go further than where they are today, with the simple fact of having good profits, many there stay and settle, they do not seek what else they can improve or implement to continue growing in the If they do not take these aspects into account, it is very possible that others will arrive that if they do so and they gain more ground in the markets and gradually displace them, they should always think about growth, the improvement of productivity would be a key factor for this process by This has a high degree of importance, therefore organizations must have a productivity measurement culture so that they can visualize what elements are influencing and see the solutions and areas of opportunity that can be presented.

Investigation methodology

For the collection of data and the analysis of the productivity of the organization, knowledge of all those elements that will be studied in an intangible or tangible way is essential since each one has a high degree of importance for the study to be carried out, that is, be seen in a comprehensive way not leaving out any element to obtain good results.

For the data collection and the application of the instrument, it is important to know the structure of the company, that is, if it is divided by departments or processes, in this case the organization is divided by departments from which five of them were selected, choosing those as more interaction or decision-making is carried out, it is worth noting that all the departments of the organization are important, but for this study only 5 departments were selected, which are:

- Management.
- Production.
- Sales.
- Finance.
- Shopping.

The variables that were studied in the departments were the six context variables which are: Environmental, Political, Economic, Social, Technological, Cultural

ISSN 2531-3002

Instrument

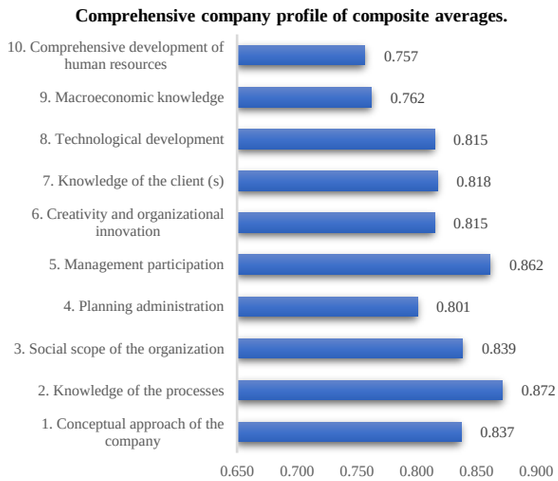
In the instrument, Comprehensive Productivity Assessment Technique (TIEP), 10 elements will be displayed, each of which has a degree of importance within the organization, having these a relationship with the variables of the context that is where the impact will be analyzed. have the elements in the organization and in what way the variables have an impact within each one. To carry out the relationships, the instrument provides two criteria which are indicated by a P that means the weighting, this will help to establish how important the elements are in the organization, the sum of the weightings is carried out vertically and its result must be 1 The second criterion is established by an E which means Evaluation, this determines the qualification that the evaluated department will obtain in relation to the 10 elements and the context variables, the qualifications range from 1 to 10.

Results

The values that can be observed below in the graphs were obtained from the weightings and evaluations of the results that gave the application of the instrument, Integral Technique of Productivity Evaluation (TIEP).

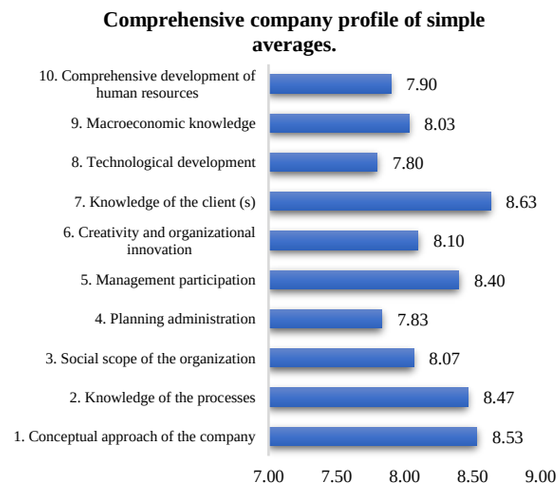
With the help of the excel package, the calculations of the integral profile of the simple average company were carried out, which is obtained from the calculation of all the averages of the weights thrown in the instrument, and the integral profile of the composite average company is obtained by multiplying all the weights for the evaluations and in the end divide them by the number of instruments applied, which in this case went to five departments.

Taking into account the results obtained in the analysis of the graph of the integral profile of the company of composite averages, as shown in graph 1, it can be seen that there is low performance in the elements of integral development of human resources, macroeconomic knowledge, technological development, planning administration, creativity and organizational innovation. Composite averages give us a more complete picture of the impact that variables have of the context in the elements in all the departments analyzed that in this case a sample of 5 departments was used.



Graphic 1 Graph of the integral profile of the company of the results obtained from the composite averages of all the departments (Management, production, sales, finance and purchases)
Source: Author's Perception 2021

Analyzing the data obtained from the graph of the integral profile of the companies of the simple averages, as shown in graph 2, it is possible to observe that there is a low performance in the elements of technological development, planning administration, integral development of human resources , social scope of the organization and macroeconomic knowledge, it is of utmost importance to give due follow-up to the elements for their correction due to the impact that the variables are having on said elements, which is affecting their productivity, therefore it is of utmost importance to study that is being carried out regarding the issue of productivity in cocoa processing companies.



Graphic 2 Graph of the integral profile of the company of the results obtained from the simple averages of all the departments (Management, production, sales, finance and purchases).
Source: Author's Perception 2021

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Proposal - Model

Proposal

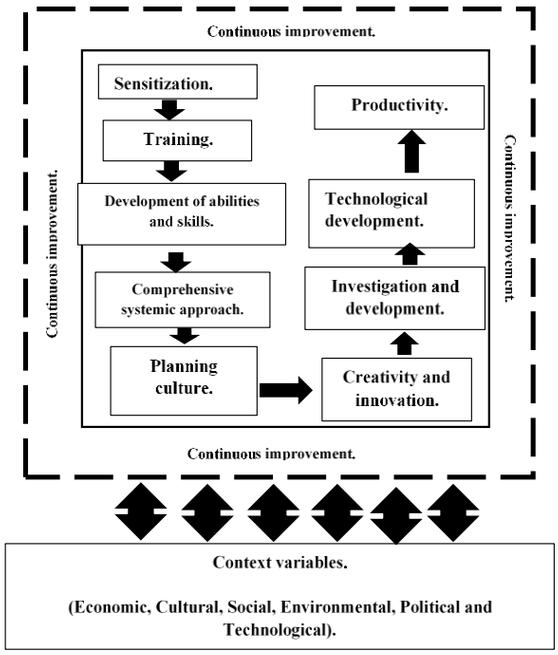

Figure 1 Proposed model for productivity improvement. *Source: Author's Perception 2021*

Interpretation of the model

Based on the results obtained in the analysis previously carried out, the following model is proposed, which starts with the sensitization of all those involved, in order to broaden the vision that they have in their organization, that is, to go into the context so that These can be related in a better way with all the elements involved and have more interaction, this being the beginning of a preparation of everything that is to be done, it will also help to make those involved aware that the requirements and contexts are changing, therefore improvements or corrections are needed to be able to survive in the market; Because sometimes those involved have been carrying out their activities in a certain way for many years and making them understand that modifications are needed is complicated and they show attitudes of opposition to change, so it is of the utmost importance to make them understand the benefits and improvements that it will have making adjustments to their way of carrying out their activities. This can be done through talks, courses, or with the creation of an awareness plan.

Training is another element of great importance, because with its help it will be possible to improve and perform activities or processes more efficiently; In this way, good work teams can be formed, since this will give us the guideline to make those involved understand how the processes or activities are going to be carried out. Staff training is the stage in which the members of the organization reinforce or renew their knowledge and skills, therefore, the company must consider the cost that these entail, either in time or financial resources, therefore it should be viewed as investment in human resources, which will generate favorable changes to the extent that the training programs that senior management determines and sees fit are followed up, these must be strategically programmed according to the requirements.

The development of skills and abilities in the staff is important, because they will be able to adopt better aptitudes and attitudes, being two elements of utmost importance for the development of activities in a person, that is, it is the process by which people improve their skills and knowledge, to perform its functions to achieve optimal and desired results over time.

With the help of the aforementioned aspects, it will be possible to obtain a comprehensive systemic approach in which those involved will visualize the organization as a whole, that is, they will be related to all the areas that make it up and their activities, taking into account factors such as internal and external. For this, all those involved in the organization must be in constant communication, working as a team, that is, everyone must know and above all understand the operation of all the areas that make up their organization, not leaving out external factors.
With a culture of planning, the organization will obtain a better strategic planning in which important points intervene such as objectives, metras, the strategies that will be followed for the fulfillment of the previous ones, a key factor of this will be the intervention that senior managers have with the other areas so that together they plan their strategies, activities, processes for the fulfillment of their goals and objectives. For this it is of the utmost importance that a strategic plan is carried out.

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Organizations must keep in mind the creativity and innovation that goes very hand in hand with research and development because the contexts and requirements of the clients change over time, it must be planned how to satisfy those requirements, in this case the company must be always innovating or improving their products to continue remaining in the market, since today the variety of products or services found in the markets is very wide, therefore, meetings should be held with senior managers to propose ideas that new products, processes that can be integrated into the organization, this is where the previous research that must be carried out intervenes to see the new requirements that the applicants have or what modifications the markets have had to proceed to look for strategies on how to supply them with the innovation of products or processes always being creative.

Implementing cutting-edge technology will be very useful for the organization because new technologies have been created to facilitate processes and activities at work, saving time and costs. Handling outdated technology can be a trigger to fall behind in the market, preventing adequate competition from other organizations in the same field. For this reason, investing in the creation of new technologies will be important, however, there are a large number of technological tools accessible to the company, but not all are adequate for its performance, so a prior analysis must be carried out.

With the union of all the aforementioned elements, they will lead to productivity, which is the main objective of this model, so it is very important to keep each one of them in mind and take into account, in order to achieve productivity, which will have an impact. of great relevance to the organization.

Continuous improvement must always be carried out since, as mentioned, the requirements change and must be covered, continuous improvement, as its name indicates, serves to improve to polish what is being done today and see how they can be done better. obtaining more benefits in all the elements involved.

Context variables should always be studied because they are the ones that will guide us in the modifications that the contexts in which we are living will have, without a doubt they are a key part of every process and especially if we want to improve productivity, they are they have an impact both internally and externally.

Conclusions

A measurement culture is of the utmost importance for every organization, therefore the improvement of its productivity must always be borne in mind, since with the passage of time the requirements of clients or applicants are presented modifications and if organizations want to survive in Markets must face these changes, looking for strategies to be able to face them in the most optimal way.

Having a comprehensive systemic approach will be of great help for organizations since they must always keep in mind all the elements that involve their company, speaking of internal and external elements, these will be a key factor to have improvements, the areas must bear in mind what the others do They should not only focus on theirs, so it is important to sensitize those involved to give way to training and then obtain something very important for them, which is intellectual capital, as we know the human factor plays a very important role in everything. this.

The areas of opportunities that organizations can find today are very broad, so it is important to bear in mind the measurement studies, but not only to stay in the study if not to give due follow-up to the factors we find and thus undertake the search for the Optimal strategies for improving these, which in the end will lead to something very important, which is increasing their productivity, which in turn will allow them to be competitive in their markets.

Recommendations

Preparation of the strategic plan: it is a document that identifies, describes and analyzes a business opportunity, examines its technical, economic and financial viability, and develops all the procedures and strategies necessary to carry out a specific business project, within it you will find aspects such as, objectives, goals, strategies, mission, vision of the organization.

ISSN 2531-3002

Strategic Planning: it is a management element that allows establishing what to do and the path that organizations must travel to achieve the planned goals, taking into account the changes and demands imposed by their environment. In this sense, it is essential for decision-making within any organization.

Awareness plan: Here the strategies that are intended to be used to sensitize the staff will be proposed, through talks, coexistence, especially the interaction of all the areas that make up the organization.

Training calendar or plans: establish dates on which internal and / or external experts will be sought to give the corresponding talks to those involved and thus show them from the use of a new tool to a new process.

Innovation on your website, social networks: nowadays social networks, web pages are of great impact for customers, so this element must be followed up, in order to capture the attention of future customers, be innovative and above all Creative on these elements will go a long way, for example planning weekly content to upload to your platforms.

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ISSN 2531-3002

Article **Journal- Business Administration -Marketing; Accounting**
December 2021, Vol.5 No.9 7-19

Mathematics: the attitude, taste and performance in this subject of the students of the bachelor's degree in Administration and Management of Small and Medium Enterprises of the Universidad Politécnica de Pénjamo

Matemáticas: la actitud, el gusto y desempeño en esta asignatura de los estudiantes de la Licenciatura en Administración y Gestión de Pequeñas y Medianas Empresas de la Universidad Politécnica de Pénjamo

ARROYO, Ignacio*†, CORONADO, Janet del Carmen and VÁZQUEZ, Glafira

Universidad Politécnica de Pénjamo

ID 1st Author: *Ignacio, Arroyo*

ID 1st Co-author: *Janet del Carmen, Coronado*

ID 2nd Co-author: *Glafira, Vázquez*

DOI: 10.35429/JBAB.2021.9.5.7.19 Received July 10, 2021; Accepted December 30, 2021

Abstract

The following research has the purpose identify factors that influence the performance of students in the Licenciatura en Administración y Gestión de Pequeñas y Medianas Empresas de la Universidad Politécnica de Pénjamo in the áreas of mathematics. The attitude, the domain, the retention and enthusiasm for mathematics are some of them, which together will determine the performance and professional development of the student. The youth of the three cycles of career training were surveyed in the period September-December 2014. Finally with the information obtained and analyzed a series of recommendations that will improve the level of youth and teacher's degree in mathematics is proposed.

Mathematics, Factors, Students, Performance, Degree

Resumen

La siguiente investigación tiene como propósito identificar los posibles factores que influyen en el desempeño de los estudiantes de la Licenciatura en Administración y Gestión de Pequeñas y Medianas Empresas de la Universidad Politécnica de Pénjamo en las materias de matemáticas. La actitud, el dominio, el nivel de retención y el gusto por las matemáticas son algunos de ellos, los cuales en conjunto, determinarán el desempeño y desarrollo profesional del estudiante. Se encuestaron a los jóvenes de los tres ciclos de formación de la carrera en el periodo septiembre-diciembre 2014. Finalmente con la información obtenida y analizada, se generan una serie de recomendaciones que permitirán mejorar el nivel de los jóvenes y profesores de la licenciatura en las matemáticas.

Matemáticas, Factores, Estudiantes, Desempeño, Licenciatura

Citation: ARROYO, Ignacio, CORONADO, Janet del Carmen and VÁZQUEZ, Glafira. Mathematics: the attitude, taste and performance in this subject of the students of the bachelor's degree in Administration and Management of Small and Medium Enterprises of the Universidad Politécnica de Pénjamo. Journal- Business Administration -Marketing; Accounting. 2021. 5-9:7-19.

* Correspondence to Author (E-mail: iarroyo@uppenjamo.edu.mx)
† Researcher contributing as first author.

Introduction

Most of the young students have been arriving at the bachelor's degree in Administration and Management of SMEs at the Universidad Politécnica de Pénjamo with a great educational lag and deficiencies in mathematics, one of the most important subjects to develop competences related to mathematical logic, analysis, and interpretation of results. Those entering university are young people who come from different educational systems in the region. In other words, students who had different: teachers, teaching methodologies, educational environments, classroom resources, classmates, study programmes.

All these factors influence the level of knowledge acquired in that period with respect to mathematics.

Each subject provides the knowledge necessary for the acquisition of the competences that contribute to the previously established profile of the future professional. If they do not learn and acquire competence in the basic subjects, they will not be able to continue with their training, the deficiency will be notorious and will be reflected in their academic achievement.

We can see the student in the classroom willing to learn, to accept as true what the teacher teaches and to do all the necessary activities and exercises. Even so, this is no guarantee that the student will acquire the knowledge that has been previously established.

In the mathematics teaching-learning process, both the student and the teacher have a shared role in education. If one of the two fail, the transmission of knowledge and the development of competences will not be achieved.

Obviously, in an educational system, it is difficult for a student to choose to stay in a subject until he/she has mastered it completely, or to retake a subject that he/she passed with difficulty in order to reinforce and improve his/her learning.

Other aspects that prevent the student from acquiring the necessary knowledge of mathematics are:

- The predisposition of the students if they enter mathematics classes thinking that it will be difficult and most likely they will fail or simply not understand what is seen, with all that in mind the young person will not make an effort to learn, they will only pass up the opportunity to learn and resign themselves to failing.

- The time spent on the subject per day or per week influences the mastery of the topics and the reinforcement of knowledge. It is unlikely that in a one-hour classroom session it will be possible to solve enough problems and exercises for a subject to be fully assimilated. This is where the need to continue practising what has been seen in class arises. But it is observed that most students do not see the need to dedicate more time to continue practising after class.

- Bad study habits and/or lack of good ones prevent a complete or acceptable development in the subject. Being a subject that involves learning processes that take a structured logic and time to learn how to use them, it requires the student to form specific habits, something that is not observed in most of them.

- As a subject that requires practising what has been seen in class, it is counterproductive to leave an excessive number of exercises for the student to learn.

- It can generally lead to information saturation and blocking, loss of knowledge and competence related to the topic.

- Trying to take the group to the next level with exercises from a higher level, even if they are related but with a higher degree of difficulty, the student may perceive this change as frustrating because even though he/she knows the subject, he/she cannot solve the exercise due to lack of skill and knowledge of other techniques and logic.

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- The tutorials that are an option to reinforce knowledge, for most students, is an activity that is perceived as something extra or punishment, or simply something that will not give points in the subject. In terms of time, it is leaving school after class time.

- Bad experiences in relation to mathematics is an element that emotionally prevents the young person from learning, and as a result, academically speaking, it is a lag in their professional training.

Entering a more demanding environment and with a more accelerated work dynamic, generally causes an imbalance in the student's performance. Most of them graduate from slow and lax educational systems, where the workload was minimal, or it was only a matter of fulfilling the requirements to pass the subject.

As in any subject, attitude is important, both student and the teacher. If a traditionalist system continues in the classroom where the teacher only explains a concept and a procedure, followed by replication of information by the student without making sense of the knowledge that can be acquired. This leads to an atmosphere of boredom, tension, frustration, and disinterest on the part of the young student.

There are many factors or elements in an educational environment that can cause the student not to learn and miss the opportunity to acquire the relevant competences. A student who finishes his or her degree without well-developed professional competences will be a person who will find it difficult to compete against other people in the labour market. The logic developed by mathematics is a basic tool for every professional.

This problem has caused the Polytechnic University of Pénjamo and the Bachelor's Degree in Administration and Management of SMEs to face this situation year after year without being able to implement adequate and timely strategies to solve the low performance of students in mathematics subjects.

Research question

Is the student's attitude towards learning mathematics a relevant factor for their professional training?

What are the factors that need more attention to improve students' performance in mathematics subjects?

Hypotheses

H_1: The attitude of young students should be adequate to take mathematics subjects in the degree course in order to acquire relevant knowledge, competences and skills.

H_2: The factors that need to be given more attention for better achievement of students in mathematics subjects are:

- Ability to learn.

- Mathematics proficiency.

- Level of retention.

- Enjoyment of mathematics.

Overall objective

To generate strategies to improve student performance in mathematics in the Bachelor's Degree in Administration and Management of Small and Medium Enterprises at the Polytechnic University of Pénjamo by analysing the factors related to the subject.

Specific objectives

To survey the students of the three cycles of the degree to obtain a data base on those factors that are involved with mathematics.

To analyse the data collected in order to generate information that will reveal these factors and their tendency among the students of the degree course.

To choose the most appropriate actions that will have a positive effect on the undergraduate students for the development of their competences and attitude towards mathematics subjects.

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Theoretical framework

Context about mathematics in Mexico According to the Revista de Educación y Cultura (2014) comments that in Mexico 33% of young people under the age of 18 who are about to finish their baccalaureate can only perform basic mathematical operations, while 30% are at the lowest levels of competence in science. The performance of young people is below the minimum which prevents them from continuing with higher education or successfully entering the labour market.

Reference is also made to the study by the National Institute for the Evaluation of Education (INEE) of 17-year-olds about to finish high school, called PISA Grade 12, which reveals that nationally at least one third are below level two in mathematical performance. It indicates that they can only perform very simple mathematical tasks such as reading a single value on a graph or table in which the names of variables are clearly identified; they can follow clear and well-defined instructions; and perform routine procedures following direct instructions.

Thirty-one per cent are at level 2, considered by PISA to be basic (Journal of Education and Culture, 2014). It categorises students who can only make literal interpretations of results, use algorithms, formulae, conventional or elementary procedures to solve problems with integers or extract relevant information from a single source of information.

In his work to improve mathematics education, Guzmán (2007) pointed out that it is necessary to break, by all means, the preconceived idea, strongly rooted in our society, stemming from initial blocks in the childhood of many, that mathematics is necessarily boring, useless, inhuman and very difficult.

Educational problems such as failure and low achievement can no longer be explained by classical socio-economic theories, the expelling school or authoritarianism (Petriz & López, 2010). In societies, as Palacios and Sandoval (2011) mention, they are a product of knowledge, as individuals are now required to be fluent in concepts, ideas, and abstract objects, which are not directly observable.

Science and technology require a solid training in the formal, particularly in mathematics, as it structures the mind, making it possible to tackle problems of various kinds.

Mathematics

The curriculum standards seek to answer the question: what mathematical content and processes should students learn to know and be able to use as they progress through their education? They are structured into content and process standards (National Council of Teachers of Mathematics, 2000). The five content standards are organised as follows: Numbers and Operations, Algebra, Geometry, Measurement, Data Analysis and Probability.

The process standards proposed by the National Council of Teachers of Mathematics in the United States are as follows: Problem Solving, Reasoning and Demonstration, Communication, Connections, Representation.

Mathematics at university level contemplates a sequence of courses related to calculus, this subject is manifested as a theory that prioritises the position that knowledge occupies in a logical chain and that emphasises the solution of routine exercises where algorithmic skills are practised, however, the ability in the mechanical application of a memorised rule does not necessarily manifest the development of thought processes linked to mathematics (Salinas, Alanís, & Pulido, 2011).

For González (2011), numerical operations involve relationships between three elements that can vary; therefore, they have a higher degree of difficulty and greater maturity in the person.

This means that in mathematics there are a large number of concepts that need to be learned intuitively, and that based on them and through rational inference, models of thought can be constructed that will generate appropriate reasoning strategies (heuristics) for the solution of mathematical problems.

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The teaching and learning of mathematics has occupied a very important place in the educational sphere and is currently being revitalised by considering that skills in this field form part of the key competences for a successful life and good functioning in society (Silva & Rodríguez, 2011). To this end, the following recommendations are made:

- Strengthen students' basic notions, pay more attention to the gaps they experience in critical conceptual knowledge, such as geometry.

- Focus pedagogical work on students constructing the basic notions and concepts of mathematics themselves, so that they become their own resources rather than recipes when solving problems.

- Pay more attention to reading comprehension and stimulate the establishment of relationships between data, as well as the generation of inferences from the situations posed.

- Implement and encourage creative ways of approaching mathematical problems. Use real problems (meaningful challenges) and clarify the type of competences to be assessed.

- Use real problems (real or hypothetical situations that are plausible for the student) that pose significant challenges and activate the student's interest and mind.

It is necessary to discourage the use of exercises that demand mechanical answers, which only require memorising an algorithm.

Días, Hernández and Hernández (1999) point out that learning the contents that are taught considers three types of knowledge: declarative knowledge that is related to knowing how to know; procedures that focus on knowing how to do and those that are linked to attitudes that refer to experiences but involve people's value judgements, although the components that have to do with attitude with respect to the two previous ones have been little attended to in the curriculum, teaching and research.

When faced with a statement, students look for a set of habitual references in the problems that allow them, on the one hand, to discover the mathematical procedure to which it refers, and, on the other hand, to decide on the most appropriate manipulation of the data contained in the statement. Here the usual mechanisms begin to be applied, and when they do not work, or work incompletely, the result is a blockage, an incoherent action, or an abandonment of the problem, comments Gómez (2002) in his studies.

Similarly, Gómez (2002) observes that in many cases, students do not recognise that what is being worked on in mathematics classes is mathematics, i.e., they are used to a mechanistic approach to this discipline, which they have been learning since primary school. But at higher levels of studies, the aim is to bring them closer to formative mathematics, from problem-solving approaches or from a cultural perspective.

This raises some unfamiliarity or perplexity, others have negative, positive reactions, although they continue to believe that this is not mathematics.

When students learn to solve problems, they must learn how to decide what to do and when to do it. If someone always tells them what to do, they will not learn these skills on their own.

> "It would be a mistake to believe that problem solving is a purely intellectual matter; determination, emotions, play an important role. A little determination, a little desire to do as little as possible may suffice for a routine classroom problem, but to solve a serious scientific problem, it takes a willpower capable of resisting years of bitter failure".

A key element for Gómez (2002) is the authority of the teacher, which is one of the images of the school, since when he poses a problem to his students, it is well posed, and the student has the necessary elements to solve it.

Chevallard, Bosch and Gascón (1997) explain that doing mathematics is a work of thought that constructs concepts to solve problems. By solving mathematical problems, mathematics as an activity introduces in many cases a fundamental component that they call mathematicising.

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Mathematics says Chevallard, (1991) is a language of its own that gives clarity to mathematical objects in order to communicate them in a precise way. For him, mathematical symbols and terms are decisive in favouring understanding.

Rejection of mathematics is not unidimensional but is lower or higher according to the type of mathematical content. There is less rejection of arithmetic and algebra, and more rejection of geometry. This is due to the forms used in the teaching of these contents, and to a certain lack of linkage between geometry programmes from one educational level to the next (Navarro & Pérez, 2002).

For several years now, changes have been made in the mathematics syllabuses of educational institutions to achieve better teaching. And for this, mathematics curricula focus on the development of student learning and competence. (Flores & Gómez, 2009). For this to be achieved, they propose that the teaching of mathematics should be based on what they call a basic culture in mathematics, in which the student should possess:

- Mathematical thinking that allows them to recognise patterns and generalise, justify results through mathematical arguments, and use representations of the same mathematical object.

- Problem-solving skills that enable them to use mathematical thinking to pose and solve problems within and outside the mathematical field.

- Competence in the use of technology that enables them to use the technologies available to them to facilitate problem solving and the acquisition of their knowledge.

- Positive attitudes towards mathematical tasks that allow them to pose problems and argue their resolution as their own responsibility that will benefit them and others.

- Human values that allow him/her to coexist better with his/her peers and the environment that surrounds him/her.

To be successful in this culture, a teaching-learning environment is proposed that allows the student to develop responsibility for the acquisition of their own knowledge, basic mathematical knowledge and competences are fostered and positive human attitudes and values are promoted (Flores & Gómez, 2009).

Attitude

In classrooms, greater emphasis is given to cognitive coordinates and programme content, forgetting that the primary fabric is attitudes and beliefs (Richardson, 2002). She points out that attitudes are the prior appraisals that a person makes about different aspects of reality and basically involve a person's disposition towards a given situation and imply a judgement about it. Similarly, Gómez (2000) mentions that contemporary mathematicians distinguish two approaches: that of the attitude towards mathematics and that of the mathematical attitude. The former emphasises the affective component, the latter the cognitive component. According to the author, the attitude towards mathematics is understood as a set of dispositions shown by the individual to accept or not, to become familiar or not, with certain content. It is here that the attitudinal aspect can be determined by circumstances, episodes or incidents for the configuration of a general judgement, such as the rejection of the subject.

The factors that influence attitude towards mathematics are liking, anxiety, usefulness, motivation and confidence, all of which are handled as constructs that need to be located within a theoretical model (Auzmendi, 1992).

The fact that language, which tries to situate concept formation, distinguishes reason and emotion, between thinking and feeling, and classifies the cognitive and the affective separately, allows us to speak of them as distinct, but reason and emotion cannot exist independently (Gómez I. M., 2002). He also comments on how a change in emotion or cognition produces a change in the other. This means that a student's behaviour cannot be considered as a result of one or the other, but that both have to be taken into account, since in learning situations what the student feels is considered as important as what he or she thinks, even in areas such as mathematics, where cognitive aspects are considered more important.

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ARROYO, Ignacio, CORONADO, Janet del Carmen and VÁZQUEZ, Glafira. Mathematics: the attitude, taste and performance in this subject of the students of the bachelor's degree in Administration and Management of Small and Medium Enterprises of the Universidad Politécnica de Pénjamo. Journal- Business Administration-Marketing; Accounting. 2021

About attitudes, Martínez and Oswaldo (2008) comment that they can be manifested through factors such as ideas, perceptions, tastes, preferences, opinions, beliefs, emotions, feelings, behaviours and tendencies to act. This is where they arrange them according to four attitudinal components such as:

- Cognitive component (knowing/knowing): corresponds to the load of information and experience acquired by the subject with respect to the object of his attitude and the same is manifested or expressed through perceptions, ideas, opinions, conceptions and beliefs from which the subject is placed in favour or against the expected behaviour.

- Affective component (emotion/feeling): this is expressed through emotions and feelings of acceptance or rejection of the person or situation that generates the attitude.

- Conative or intentional component (intention): is expressed by the subjects through their voluntary inclusion to perform an action.

It has the predisposition, predilections, preferences, tendencies or intentions to act in a specific way towards the object.

- Behaviour component (behaviour): is formed in the observable conduct, properly speaking, which will be conceived as a set of behaviours.

- Under the same theme, Gómez (2003) comments on two types of attitudes:

Gómez (2003) adds that due to their mathematical attitudes, subjects can be considered as attitudes that should be taken into account as an affective dimension that should characterise them, for this it is important to distinguish between what the subject is able to do (ability) and what he/she prefers to do (attitude). This can be seen in table 1.

Category	Attitude
Attitudes towards mathematics	- Towards mathematics and mathematicians - mathematicians (social aspect of mathematics). - Towards mathematics as a subject. - Towards certain parts of mathematics - Towards methods of teaching mathematics. - Interest in mathematical and scientific work.
Mathematical attitudes	Flexibility of thought. Open-mindedness.

Table 1 Attitude categories when the object is mathematics

Martínez and Oswaldo (2008), cite Polya's statements Page 12 (1965, p. 80) where he comments that it would be a mistake to believe that solving a problem is a purely intellectual matter, since determination and emotions play a role.

(80) where he comments that it would be a mistake to believe that solving a problem is a purely intellectual matter, as determination and emotions play an important role. Here, affective referents are involved in the success or failure of students and teachers in the development of their tasks aimed at the production of knowledge and the construction of mathematical knowledge.

The National Council of Teachers of Mathematics (2000) published the six principles for school mathematics, which are:

1. Equity: Excellence in mathematics education requires equity; high expectations and strong support for all students.

2. Curriculum: It must be coherent, focused on relevant mathematics and well-articulated across the different levels.

3. Teaching: Effective mathematics teaching requires knowing and understanding what students know and need to learn about mathematics; and then motivating and supporting them to learn it well.

4. Learning: Students must learn mathematics by understanding it, actively constructing new knowledge from their expectations and prior knowledge.

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5. Assessment: It should support the learning of relevant mathematics and provide useful feedback to both teachers and students.

6. Technology: It is essential in the learning and teaching of mathematics. Students can develop a deeper understanding of mathematics through the appropriate use of technology.

Methodology

To carry out this research, the following methodology will be followed:

Type of research: The present will be a descriptive and non-experimental research as only the population will be analysed without altering the variables, conditions and space that comprise it.

Universe: The Polytechnic University of Pénjamo.

Population: Students of the Bachelor's Degree in Administration and Management of Small and Medium Enterprises.

Sample: Students of the three training cycles of the degree (first, fourth and seventh semester).

Setting: The research will be carried out in the Bachelor's Degree in Administration and Management of Small and Medium-sized Enterprises.

Timeframe: September-December 2014

Instrument: Survey: The survey will be applied in writing to each student of the three semesters and will consist of 16 items with a Likert-type response scale.

Data collection: SPSS Version 18 software to divide data by term and trends in percentages; and Microsoft Excel 2010 for the generation of more specific graphs.

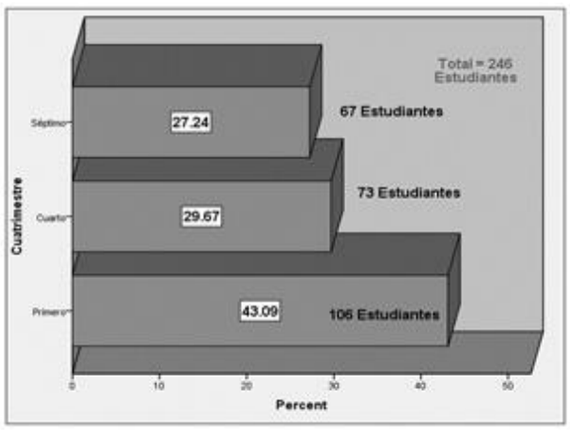
Data analysis: Percentage trends will be observed for each of the three semesters.

Results: The results will be presented in tables and graphs that specify the trends of the factors chosen for the research. The results will be used to generate strategies to improve students' performance in mathematics.

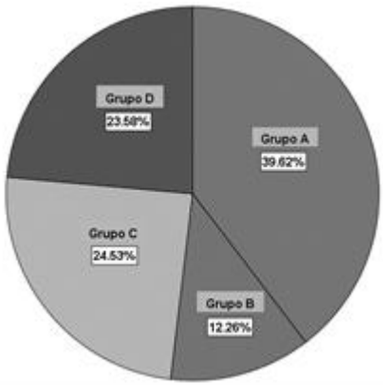
Results

Based on the surveys applied and the trends observed, we show below the results obtained using SPSS software for the concentration and division of the data by term, as well as Microsoft Excel to visualise the information in tables and graphs.

We surveyed 246 students enrolled in the bachelor's degree in Administration and Management of Small and Medium Enterprises, which are divided as follows as shown in graphics 1, 2, 3 and 4.



Graphic 1 Students per semester of the course September-December 2014



Graphic 2 First four-month period

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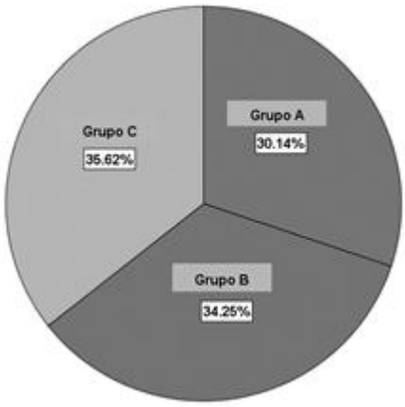
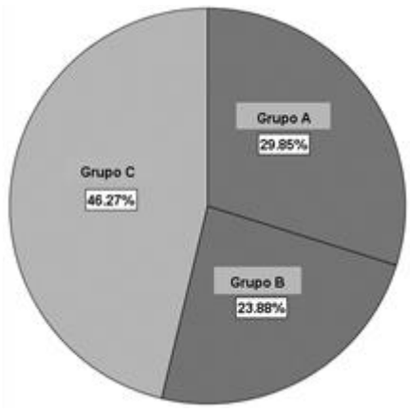


Graphic 3 Fourth four-month period



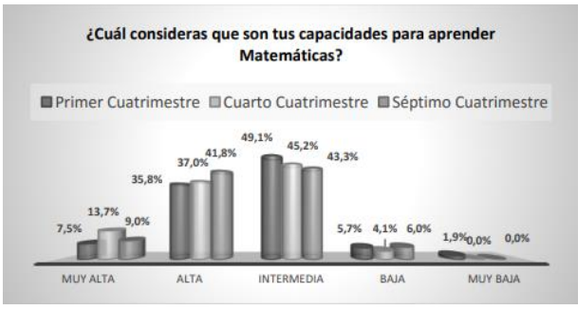
Graphic 4 Seventh four-month period

Most students are from the first semester and the least number from the seventh semester. In this degree, the first cycles of training are the ones that take the most mathematics in relation to the last four-month period.

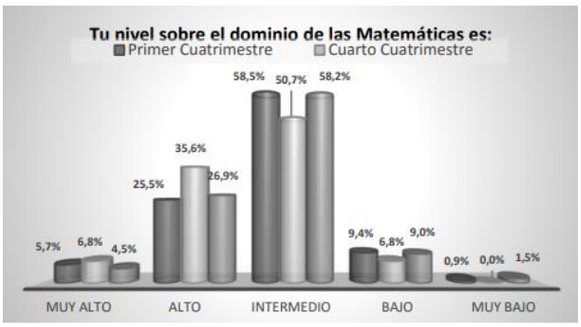
The results of the factors taken into account for this study are shown below, due to the large amount of information generated during the analysis process.

Graphic 5 First question

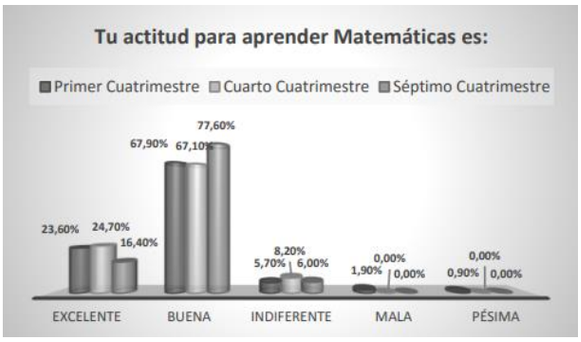
Graphic 6 Third question



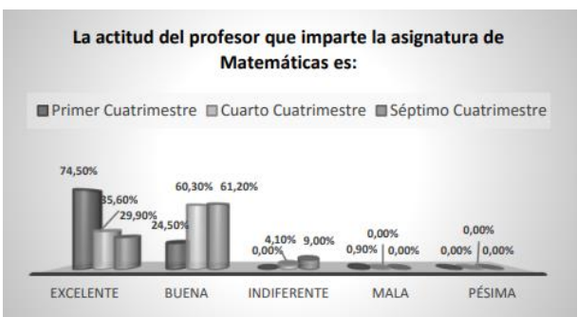
Graphic 7 Question 4



Graphic 8 Fifth question



Graphic 9 Question 7



Graphic 10 Eighth question

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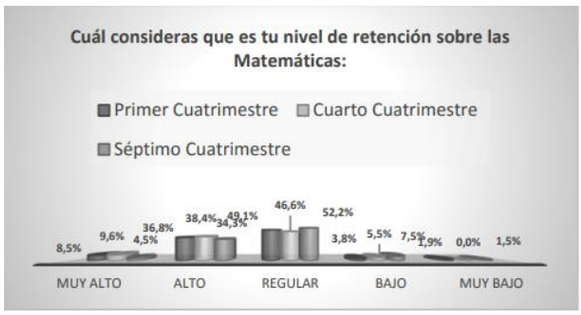
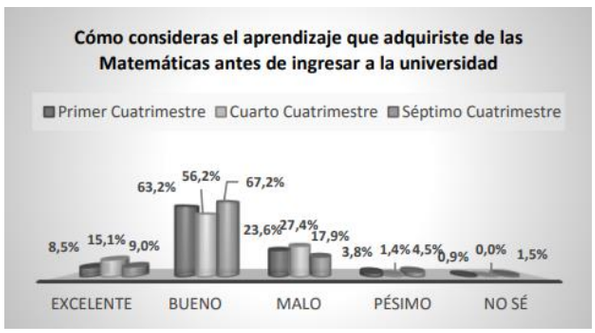
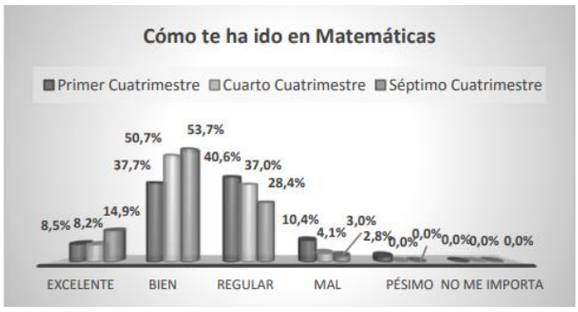


Graphic 11 Ninth question

Graphic 12 Tenth question

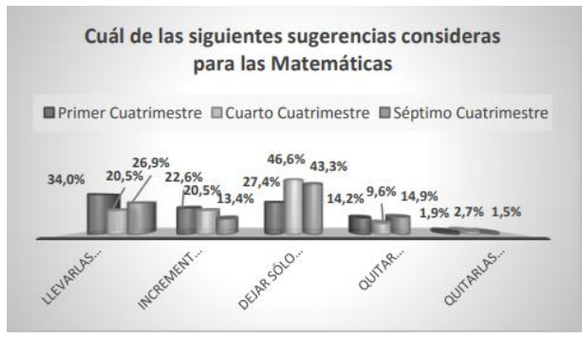


Graphic 13 Eleventh question



Graphic 14 Twelfth question

Graphic 15 Thirteenth question



Graphic 16 Fourteenth question

Analysis

With the evidence collected from the surveys, there are results with clearly verifiable trends. Among them, it is observed that:

1. Students consider mathematics to be important mathematics both for their education and for their professional life. for their professional life.

2. They have a great willingness to learn mathematics to learn mathematics and to acquire the associated associated with it.

3. They consider themselves to have a medium-high ability and proficiency in mathematics-related subjects. related to mathematics.

4. The level of knowledge of the teachers teachers who teach mathematics subjects is high and and adequate, and that they have a good attitude and adequate, and that they have a good attitude to the subject and transmitting knowledge. knowledge.

5. The students consider that they have a good and excellent attitude towards mathematics. This helps them to be mentally prepared for the teaching-learning process, as well as to make the necessary effort to acquire the knowledge.

6. The topics seen and the evaluation system are adequate, that is, if they are oriented to what the youngsters are expected to learn and the way of grading it together with the percentage value of each evidence.

7. A large part of the student body considers that they have an average level of retention with respect to mathematics, which is an important point to consider for this research.

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8. The young people, according to their grades, consider that they have had a good achievement in this subject, since they show that they study to learn.

9. The taste for mathematics is varied among young people, i.e., among young people although they consider mathematics to be important, it is not that they consider mathematics to be important, it is not enough reason to have a taste for it. reason enough to have a liking for numbers. numbers. A percentage does like mathematics, but a similar a similar proportion only sometimes. This is another important point to consider for the research.

Discussion

As can be seen in the results, the hypotheses raised for this research can be verified. Indeed the young people take the subjects with a good attitude. It helps them, together with the teaching-learning process, to obtain good grades and averages between 8 and 10.

The factors that have been neglected by the professor, the career and the university coincide with those proposed in the second hypothesis. It is expected that by taking them into account and strengthening them, the level, capacity and mastery of mathematics will increase. As well as the level of retention and the taste for numbers in this career. This is not easy, since it is a matter of changing a system that has not interacted much with the students in the sense of seeking that all or most of them acquire a taste for mathematics. That they have enough confidence to ask for advice, to make more effort and increase their level of knowledge, to acquire in their totality the competencies and abilities that mathematics develops in man.

Recommendations on mathematics

Based on the research and data collected, the following recommendations are made and shown in Table 2.

Aspect	Recommendations
For curriculum	- Incorporate mathematical logic as a generic competency. mathematics. - Incorporate as specific competencies: problem solving, reasoning and demonstration, communication, connections and representation of numbers and data. - To increase the number of subjects related to mathematics throughout the career.
For the subject	- Add topics related to numerical logic, data analysis, reflection and decision making based on numbers. - Include evidence where they are asked to make decisions based on numerical results, going through the whole process of analysis and problem solving. - Include mathematical tasks that allow them to pose problems and argue their resolution as their own responsibility that will be to their benefit and to the benefit of others.
For the teacher	- Flexibility of thought. - Open-mindedness. - To make classes more reflective. - Generate confidence in the student. - Use examples, exercises, problems and practical cases (real or invented) that develop analytical skills and numerical logic. - Open a space outside of class for permanent individual or group counseling. - Join (by invitation) study groups that students generate. - Search and identify and recommend resources on the web that will help strengthen the learning of young people. - Reinforce the basic knowledge of the students with complementary classes to the subject.
For the student	- Flexibility of thought. - Open-mindedness. - Personalized advice. - Get into the habit of solving problems outside of class and on your own. - Losing the fear of making mistakes. - Form study groups. - To build the notions and basic concepts of mathematics by themselves.

Table 2 Aspects and recommendations on mathematics

Conclusions

All the above implies a change in the teaching of mathematics, a change that has already been achieved in other parts of the world. However, it is a process, and as such it will take time and effort to incorporate it into a system that, although it has a good level, will take time to be effective.

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In mathematics, it is not only the level of a student's learning that should be of concern, but the extent to which that student requires direct teaching of each step. The experiences one has had with mathematics as a teacher and student are what dictate how it is perceived today, good, bad, indifferent. This fact is another aspect that must be considered for teaching and learning in these subjects. All this leads the teacher to raise questions in the classroom whose answer is unique, or that are solved using a certain algorithm, which must be remembered, and takes little into consideration other behaviours.

The teacher is required to develop the procedures step by step and to verify that the student understands them, creating a security of knowledge that motivates a change of attitude towards mathematics; the support and attitude provided by the teacher must be adjusted, according to the characteristics of the learning and the tasks. It is possible to achieve the change, it requires a voluntary and constant participation of the teacher, the student and support from the institution to make it happen.

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ISSN 2531-3002

Article **Journal- Business Administration -Marketing; Accounting**
December 2021, Vol.5 No.9 20-28

Positioning Sucre as a tourist destination

Posicionamiento turístico de Sucre

FERNÁNDEZ, José†, ESPADA, Gisela and ESPADA, Olga

Universidad Mayor Real y Pontificia de San Francisco Xavier de Chuquisaca, Faculty of Law, Political and Social Sciences. Colombia Street corner Germán Mendoza Avenue. Sucre. Bolivia.

ID 1st Author: *José, Fernández*

ID 1st Co-author: *Gisela, Espada*

ID 2nd Co-author: *Olga, Espada*

DOI: 10.35429/JBAB.2021.9.5.20.28 Received July 20, 2021; Accepted December 30, 2021

Abstract

This research analyses the importance of touristic image in the positioning of a destination in the tourism area. Also, the diversity of touristic brands that the city of Sucre presents to develop tourism is examined, which lay in between the destination´s competitiveness and even the sustainability. As a result, we ask each other. How this duality of touristic images affects to the competitiveness of tourism in Sucre? What are the causes for which Sucre has two touristic images? We should also mention that the city of Sucre has a touristic brand designed by the Direction of Tourism of the Mayoralty of Sucre. It is evidenced that it is necessary that the city of Sucre develops a brand image that is based on the touristic strategies of the tourism strategic plan, so this image answers to the local necessities while positioning Sucre in the chosen demand segment. It is no longer possible elaborate a brand image based in personal whims or just the perception of the local population, the most important thing is the perception of the touristic demand.

Tourist image, Images, Sucre

Resumen

Esta investigación analiza la importancia de la imagen turística en el posicionamiento de un destino en el ámbito turístico. Asimismo, se examina la diversidad de marcas turísticas que presenta la ciudad de Sucre para desarrollar el turismo, que se interponen entre la competitividad del destino e incluso la sostenibilidad. Como resultado, nos preguntamos ¿Cómo afecta esta dualidad de imágenes turísticas a la competitividad del turismo en Sucre? ¿Cuáles son las causas por las que Sucre tiene dos imágenes turísticas? También debemos mencionar que la ciudad de Sucre tiene una marca turística diseñada por la Dirección de Turismo de la Alcaldía de Sucre. Se evidencia que es necesario que la ciudad de Sucre desarrolle una imagen de marca que se base en las estrategias turísticas del plan estratégico de turismo, para que esta imagen responda a las necesidades locales y posicione a Sucre en el segmento de demanda elegido. Ya no es posible elaborar una imagen de marca basada en caprichos personales o sólo en la percepción de la población local, lo más importante es la percepción de la demanda turística.

Imagen turística, Imágenes, Sucre

Citation: FERNÁNDEZ, José, ESPADA, Gisela and ESPADA, Olga. Positioning Sucre as a tourist destination. Journal-Business Administration-Marketing; Accounting. 2021. 5-9:20-28.

† Researcher contributing as first author.

Introduction

The city of Sucre has been an important tourist destination since the 1970s. Over the course of these years, Sucre's tourist image has changed due to different circumstances. The different tourism actors elaborate their tourist offer based on different perceptions of the tourist image. This situation prevents the positioning of Sucre as a competitive destination in the tourism market. This implicitly affects the sustainability of tourism activity.

In the current environment of globalization of tourism markets with internationalization business strategies, tourist destinations are immersed in a competitive gale against each other, even if they are geographically dispersed. As a result, destinations face a complicated process of survival in which the strategy of differentiation and competitiveness mark their trajectory. In this sense, one of the guidelines that mark the differentiation is the tourist positioning of a destination within a competitive context. Consequently, the objective of this academic work is to analyze the tourist positioning of Sucre based on its tourist brand image. In this context, the research question guiding this work is: To what extent is Sucre's tourism positioning with its current tourism brand image competitive in the field of tourism?

Many destinations have problems with tourism positioning, and it is argued that it is the lack of communication. In reality, what we must affirm is that communication is the problem. In the field of tourism, a new way of looking at communication is through the approach of positioning, a concept so simple that tourism authorities fail to understand how powerful it is. First of all, we must clarify that tourism positioning does not refer to the destination, but to what is done with the minds of the probable clients or people to be influenced; in other words, how the destination is positioned in their minds. Positioning is the first thing that comes to mind when trying to solve the problem of how to be heard in an over-communicated society.

Tourism has become one of the most important socioeconomic activities for the city of Sucre, given the lack of a business structure in other economic sectors. In this sense, public authorities and tourism entrepreneurs are investing in this growing activity.

However, the city of Sucre is not unique with its offer in the national and international context. For this reason, it is urgent to analyze the importance of the tourist image and its impact on the competitiveness of the tourist activity developed in Sucre.

This is due to the fact that the agencies responsible for promoting tourism have little coordination in this area, which means that each of them has a different perception. Nowadays, in the field of tourism destinations, one of the factors related to competitiveness and sustainability is the image of the tourist destination (OMT, 1999).

It is necessary for the tourism authorities of the city of Sucre to know the perception that consumers (tourists) have of the product(s) of this city. This will allow them to establish, among other things, the current position of their product with respect to those of the competition or with respect to a series of attributes. Correct differentiation and positioning will constitute a competitive advantage for the city.

Tourism branding allows products to be identified and, at the same time, to differentiate them from their competitors. They can be powerful tools for creating a positive image of the product and the company. And image is a matter of great importance in tourism. The commercial management of the company or those responsible for the promotion of tourism destinations should strive to establish an image that distinguishes the city from other destinations and determine whether they are willing to invest significant resources in creating a strong brand image and what kind of branding strategy they want to follow. A tourism image should communicate the attractions and distinctive positioning of the place. Developing a strong and distinctive image requires creativity and hard work on the part of these stakeholders. Symbols are often very important for the recognition of a tourism brand, and the differentiation of its image. The symbols chosen should be communicated through advertisements that express the personality of the tourism brand.

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The inclusion of marketing strategies in the actions carried out by public institutions, such as municipal governments, can generate very positive results in both economic and social terms. In particular, the creation of a brand image-provided it is managed correctly- can satisfy objectives as diverse as obtaining greater opportunities for economic expansion, strengthening relations with other governments, improving public opinion, attracting investments (domestic or foreign) and consequently reducing the unemployment rate, increasing foreign exchange income by attracting international tourists, helping to preserve both the historical-cultural and natural heritage, among others. It is precisely because of these qualities of the -city brands‖ that a growing number of municipalities are currently including the creation of a local brand in their strategic plans, in order to be identified and differentiated. At the same time, it is also possible to identify the same strategy at higher levels of government.

But what is a brand image technically? As José Crespo -an expert in strategic communication- mentions, it is the effect of global meaning -activated‖ by a country in the minds of citizens around the world; that is, an imaginary or abstract construction, configured from the interaction of meanings associated with identity (given by the distinctive features and characteristics of a country), personality (human aspect with which the image of a country is clothed) and the general service of the country (i.e., the functions and utilities provided by the country within the international concert, through what it does). The reasons that, according to Crespo, justify the need for its development are related to the maximum competition between regions, countries and companies, the tariff and para-tariff barriers of the central countries, the concentration of distribution channels, the saturation of messages in the global media space, the difficulty of countries of lesser geopolitical weight to access third markets, among others.

Based on the above, the brand image of the city of Sucre was not designed exclusively to position it competitively in the tourist activity, but rather, it is a municipal institutional decision, under criteria of limited social consensus. Although the tourism sector encompasses multiple sectors, it is necessary to seek consensus.

On the other hand, when speaking of the multiple sectors involved in this activity, reference should not only be made to the public and private sectors, but the local community should also be considered from the outset, since it is its members who will experience the consequences of any decision, and on whom the outcome of the strategy depends to a large extent, whether it will be positive or negative, since the favorable or unfavorable attitude of the residents is a determining factor in the strategy's implementation process. Furthermore, in order to create an effective brand image, it must first be accepted by the local inhabitants. Once local acceptance and internalization of the brand, as well as the values it promulgates, have been achieved, the community will be the main promotional agent. And in this way, the tourist positioning of the Sucre tourist destination will be linked to competitiveness and sustainability criteria.

Finally, having reflected on the concrete benefits of creating a brand image, there is no doubt about the usefulness of this type of strategy as an integral tool for tourism positioning. However, it is necessary to emphasize that the branding strategy is a tool, not the solution to all the problems of a destination. Therefore, it is necessary to urge the municipal government of Sucre to develop a brand image, without forgetting that it should not be an end in itself, but a means to achieve the desired results, since it is not simply a matter of positioning the city of Sucre in the minds of the target public, but of what can be achieved thanks to this tourist positioning.

Currently, the city of Sucre has, implicitly, two tourist images, on the one hand is the architectural wealth, reinforced by the nomination of UNESCO, as a cultural heritage of humanity. On the other hand, there is the tourist image of the Dinosaur footprints in the area of Cal Orcko. Consequently, it is worth asking how this duality of tourist images affects the competitiveness of tourism in Sucre. What are the causes for Sucre to have two tourist images. Also, it is worth mentioning that the city of Sucre has a tourist brand designed by the Directorate of Tourism of the Mayor's Office of Sucre.

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Results and discussion

For the development of this work, bibliographic documents were analyzed, as well as the tourist brands used in Sucre. The survey technique was also used to obtain information about people's knowledge of Sucre's tourist image.

The fieldwork was carried out during 2 months in the city of Sucre.

Tourism in Sucre

Tourism in the city of Sucre dates back to colonial times, however, institutionally, tourism in Sucre is considered a priority activity since the seventies. Since then, the tourist flow has been increasing. Currently, Sucre has a tourist flow of around 22,904 tourists, which represents approximately 5% of the total flow of foreigners to the whole country. The flow of domestic tourism with a total of 35,942 national residents in Sucre represents 4% of the total flow of national residents.

The main international issuing markets are very diverse: 15.8% of them are French, 10.8% are British, 9.3% are German, and 6.50% each are American and Swiss. It is possible to mention that the remaining percentage shows great variety in terms of nationality, including Australian, Canadian, Dutch, Spanish and others. Regarding national tourists, 23.2% come from Cochabamba, La Paz is in second place in outbound tourism to Sucre with 21.1%, then Potosi with 17.6% of the total of national tourists arriving to Sucre, and finally Santa Cruz is in fourth place with a share of 15.8%, making these 4 cities about 67% of the total visitors to the city of Sucre. The rest of the national tourists are made up of travelers from the cities of Tarija with 8.7%, Oruro with 7.9%, Beni with 3.4% and finally Pando with 2.4%.

This influx of tourists is conditioned by the tourist seasonality. That is, the flow of visitors is marked by two seasons: low and high. In the high season, the international market visits Sucre in winter and the national market in summer. During the low season, the tourist flow is limited. However, the average stay of visitors in Sucre is 2.3 days for foreigners and 1.9 days for Bolivians.

The tourist offer that motivates the flow of tourists to Sucre is based on tourist services and attractions. Within the services, Sucre has means of transportation in regular conditions, since the airport infrastructure is precarious and within the terrestrial infrastructure there is only the asphalted stretch that is Sucre-Potosí. There are different categories of lodging. During the last decade, the hotel offer has improved ostensibly. In terms of places to eat and recreation, the offer has also increased. Travel agency services have also increased and offer different possibilities for tourist activities. Regarding tourist attractions, Sucre offers cultural resources based on the colonial architectural heritage, the paleontological wealth of Cal Orck'o and District Eight with the presence of ethnic groups and archaeological remains.

The main actors involved in the development of tourism in the city of Sucre are related to the public sector, whose main articulator is the Municipal Mayor's Office. The private sector includes travel agencies, hotels, restaurants, tourist transportation, museums, and tour guides.

Sucre tourism products

The supply of tourism products in the city of Sucre has increased over the years. The initial products were the city tours or tourist visits around the city and the Sunday visit to the Tarabuco indigenous fair. The city tours product is based on visits to museums and tours of the city since the city has the title of heritage city. On the other hand, the visit to the Sunday fair is based on the presence of indigenous people and local commerce. This Sunday market is one of the most authentic in Latin America. Subsequently, travel agencies began to offer the cultural and archaeological richness of District Eight. This product, called District Eight, offers activities based on hiking, trekking, visits to the communities and observation of archaeological and paleontological remains. And, in the nineties, dinosaur footprints were discovered in the Cal Orck'o area, becoming the star product. For this reason, a park was built, called Cretaceous Park.

ISSN 2531-3002

Of the products, the products that make up Sucre's tourism offer are: The cultural and architectural heritage of the city of Sucre, the ethnic and archaeological cultural richness of District Eight and the paleontological richness of Cal Orck'o.

From this identification we can conclude that there are several elements to consider for the elaboration of a brand image: urban culture, ethnic culture, architectural heritage, archaeological heritage and paleontological heritage. Obviously, this diverse set of tourism products complicates the positioning of tourism and the design of a brand image. However, decisions have to be made in order to be competitive. With this in mind, in the next point, we will analyze the brand image at the state and municipal level, with the purpose of analyzing to what extent Sucre's tourism brand image is consistent with the tourism products offered by Sucre's tourism entrepreneurs.

Tourist image of Bolivia and the city of Sucre

Bolivia's tourism brand image has two elements: a slogan and a logo. The slogan has the following text: Bolivia, the authentic still exists. This slogan contains elements that are based on the products. That is to say, this slogan tries to transmit the message that in Bolivia, authentic cultures and authentic nature exist. What kind of authenticity does it refer to? The concept of authenticity is very complicated to define. According to the definition of the Royal Spanish Academy, authentic means: Accredited of certain and positive by the characters, requirements or circumstances that concur in it. As you can see, this concept has many vertices of definition. Therefore, what this slogan mainly transmits are the characteristics of the product and the benefits that the consumer or tourist can obtain. That is, to see culture and authentic nature. But ironically, Bolivia is not the only country that has these products.

Regarding the logo, it is represented by a llama and a stylized palm tree on a background with a handmade fabric texture and the colors are red, yellow and green. Analyzing the image, we can mention that once again it transmits an image of the tourist product that Bolivia offers.

However, this logo does not manage to transmit an image of the tourist destination Bolivia, because the characteristics of the logo are not unique, and can be confused with those of other destinations. For example, llamas and palm trees exist in many places in Bolivia.

Figure 1

In summary, this image of Bolivia's tourism brand is very focused on the product, but not on positioning the country in the minds of visitors. Since, from the aesthetic point of view it is perfect, but it generates a very confusing visual image of the country. Going deeper into the analysis, the slogan, translated into other languages, acquires connotations that are different from the original conception.

It is very important for Bolivia to rethink its tourism brand image in order to position itself competitively in the minds of potential tourists and to consolidate its position in the minds of current tourists.

The tourist brand image of the city of Sucre is made up of two elements: a slogan and a logo. The slogan is based on the text:

The colours of time‖. This text fails to convey any message, since it is very ambiguous. In a more detailed analysis of the slogan, it can be interpreted that the city of Sucre has a diversity of historical periods. From another perspective, perhaps, it is related to the changes that existed in Sucre. In concrete terms, it is very complicated to interpret this slogan.

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Figure 2

From a touristic point of view, it fails to convey any message, not even from the product perspective. Regarding the logo, it is structured in a rectangle, based on two colors, red and blue, divided in the middle by a white line and has the silhouette of a tower in the middle. This logo sends two messages, on the one hand by means of the colors that have no relation with the colors of the city, which are red and white. Therefore, the meaning of the colors of the logo is unknown. The image of the tower, we consider that it alludes to the architectural heritage of Sucre. From the academic analysis. It can be mentioned that this logo is focused on the characteristic of promoting the tourist product, but not the image of Sucre. It is understood that the image of Sucre is not only conformed by the colonial architecture, but it is the set of diverse factors, such as its climate, people, environment, among others. Therefore, the tourist brand image promoted by the mayor's office of Sucre has ambiguities that prevent the Sucre tourist destination from achieving a competitive position in the potential and real tourist demand.

In this context, there is also another tourism brand image where Sucre is involved. This tourism brand image was designed by the Destination Management Organization - OGD, Sucre-Potosí-Uyuni. The main objective of this organization is to promote the development of tourism in the cities of Sucre-Potosi-Uyuni. To this end, it developed various activities in the different cities. However, a common factor was the design of a tourism brand image for the three regions. This image has two elements, a slogan, and a logo.

Figure 3

This corporate brand image does not reflect from any point of view the characteristics of the city of Sucre.

At present, the municipal tourism department uses the brand image under the slogan: Sucre turístico.

This new brand image has serious limitations to position Sucre as a competitive tourist destination.

Results obtained

In order to obtain information, a survey of 60 people was carried out with three questions, the first one with a closed answer and the other two with an open answer that allows for multiple responses.

First question: this question has a closed answer in the first part, but if the answer is affirmative, it is requested to indicate which is the tourist image they know, to know if the image issued by the tourist authorities is known and really responds to the characteristics and appreciation of the people.

1.- Do you know Sucre's tourism brand image?	
YES	39
NO	21
TOTAL	**60**

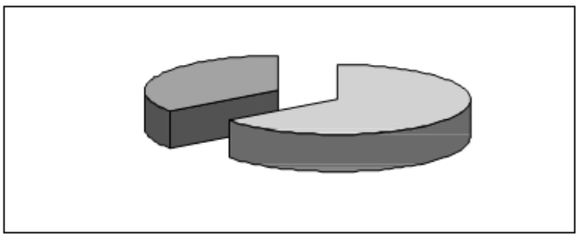

Table 1 Do you know the image of Sucre's tourism brand?

Within this response it is possible to appreciate that 65% affirms that they know Sucre's tourism brand image; however, when asked to indicate which image they know, they indicate options that are not really the brand image. The responses that stand out the most are those detailed in Tables 2 and 3 below.

What is? Answers that encompass many aspects	
City architecture	3
White City	4
Colonial City	6
Tourist Attractions	2

Table 2 What is it?

What is it? Responses that encompass only specific tourist attractions or sites	
San Francisco Bell	3
The House of Freedom	8
La Recoleta	5
Dinosaur footprints	19
The Sica-Sica and Churuquella Hills	7
Tarabuco	4

Table 3 What is it?

Among the responses that stand out the most are the dinosaur footprints, followed by the house of freedom and the Sica-Sica and Churuquella hills. Thus, it can be assumed that people do not really know Sucre's tourist brand image.

Second question: the objective of this question is to know what is the most representative in Sucre, in order to issue a tourist brand image that really represents what Sucre has to offer to visitors. The answers are diverse, which is why the analysis is based on two parameters: first, the answers that include many tourist aspects and the second part in answers that point only to certain tourist attractions.

2.- Which image represents Sucre? Answers that encompass many aspects	
City Architecture	7
White City	6
Colonial City	5
Cultural City	1
Student City	2
Historic City	8

Table 4 Which image represents Sucre?

In the first part of the analysis of the second question, it is possible to observe that the most representative for the people, in terms of image, is represented by the characteristic of Sucre as a historical city, followed by the architecture of the city, then the name of White City, colonial city and the other responses that are detailed in Table No. 4 and the percentages of the graphic 4.

2.- What image represents Sucre? Responses encompassing only specific tourist attractions	
The image of a Tarabuqueño	3
Textiles	3
The Sica-Sica and Churuquella Hills	14
La Recoleta	3
La Casa de la Libertad	11
Dinosaur footprints	25
Glorieta Castle	1

Table 5 What image represents Sucre?

As for the second part of the analysis of the second question, referring to the attractions specifically speaking, we find the dinosaur footprints, followed by the Sica-Sica and Churuquella hills, the Casa de la Libertad, and the other answers as shown in Table No. 5 and graph 5.

Third question: the purpose of this question is to determine the image that, according to local people, tourists have when they visit Sucre. There were also several answers, which were divided, as in the second question, into two parts of analysis: the first one encompassing different characteristics or aspects of Sucre and the second part into specific attractions, as detailed in Tables 6 and 7.

2.- What image represents Sucre? Responses encompassing only specific tourist attractions	
The image of a Tarabuqueño	3
Textiles	3
The Sica-Sica and Churuquella Hills	14
La Recoleta	3
La Casa de la Libertad	11
Dinosaur footprints	25
Glorieta Castle	1

Table 6 According to your perception, what is the tourist image that tourists have of Sucre?

ISSN 2531-3002

In the first part of the analysis, many people assume that tourists perceive Sucre as a Colonial city, Historical city, White city, architectural city and other aspects that are found in a lower number of responses, as described in Table Nº 6 and shown by the percentages in the graph 6.

3.- According to your perception, what is the tourist image that tourists have of Sucre? Responses encompassing only specific tourist attractions	
the Pujllay of Tarabuco	2
The House of Freedom	1
Dinosaur footprints	6

Table 7 According to your perception, what is the tourist image that tourists have of Sucre?

In the second part, it is possible to verify that some people assume that the tourist image of Sucre for tourists is represented by the dinosaur footprints, then the Pujllay and finally the Casa de la Libertad, as shown in the table below Nº 7.

From the results obtained, it is possible to indicate that Sucre's current tourism brand image is not well known and that it does not contemplate the characteristics that people have of a tourism image for Sucre. The analysis of the results shows that the most representative tourist brand image of Sucre is the dinosaur footprints, followed by the characteristics of the city's colonial architecture.

Conclusions

According to the analysis carried out, it can be concluded that the city of Sucre underwent a metamorphosis in the field of tourism image, but under no circumstances did these changes manage to represent the tourism attributes of the city of Sucre in a competitive manner.

This situation shows that the tourism activity developed in our city is still at the stage of artisanal development. Where, the main axes of tourism development are the intensive use of the rich diversity of resources by the actors to achieve short-term benefits. In the same tone are the public institutions that have serious limitations in terms of tourism planning, which has repercussions in the fact that it is still not defined what type of tourism is developed in Sucre and what type of tourists are the target audience.

For these reasons the current tourist image of Sucre is: Sucre Turístico, trying to suggest that all kinds of tourists can come to the city of Sucre, that this tourist destination is inclusive, that we are a destination where there is everything for everyone, a huge fallacy.

These circumstances generate that the competitive participation of the city of Sucre is limited and confined to wait for tourist flows of overflow. Economic investments that generate limited returns, given the diffuse tourist image of Sucre. Intensive and improvised use of resources without taking into account aspects of preservation and valuation.

It is also possible to observe that the results of the surveys show that the most representative tourist image for the people are the dinosaur footprints and the characteristics of colonial architecture that has different infrastructures in the city, and the authorities should work on the basis of such characteristics so that they really represent what Sucre implies in the tourist activity.

In summary, it is necessary for the city of Sucre to develop a brand image that is based on the tourism strategies of the strategic tourism plan, so that this image responds to local needs and is positioned in the chosen demand segment. It is no longer possible to develop a brand image based on personal whims or only the perception of the local population, the most important thing is the perception of the tourism demand.

Acknowledgments

The researchers would like to thank the Dirección de Investigación Ciencia y Tecnología (DICYT) of the Universidad San Francisco Xavier de Chuquisaca for their support in the development of this work.

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ISSN 2531-3002

Article **Journal- Business Administration -Marketing; Accounting**
December 2021, Vol.5 No.9 29-38

Quantitative methodology and mobile technology to evaluate the quality in use of projects-products-services in innovation events through metrics

Metodología Cuantitativa y Tecnología Móvil para Evaluar la Calidad en uso de Proyectos-Productos-Servicios en Eventos de Innovación mediante Métricas

VARGAS, Laura, GUTIERREZ, Agustín, EDGARDO, Felipe, VARGAS, Vanessa and PERALTA, Jorge

Instituto Tecnológico de Ciudad Madero, Mexico.
Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico.
Instituto Politécnico Nacional, Mexico.
Universidad Autónoma de Tamaulipas, Mexico.

ID 1st Author: *Laura, Vargas*

ID 1st Co-author: *Agustín, Guitierrez*

ID 2nd Co-author: *Felipe, Edgardo*

ID 3rd Co-author: *Vanessa, Vargas*

ID 4th Co-author: *Jorge, Peralta*

DOI: 10.35429/JBAB.2021.9.5.29.38 Received July 30, 2021; Accepted December 29, 2021

Abstract

The PROYEVA System is presented, based on international standards (ISO/IEC 9126, 14598, IEEE 1061) and Mexican models (MECHDAV, MECRAD), which allows a comparative analysis of the different projects and products participating in innovation and invention contests. It is based on the determination of the degree of compliance with the following quality characteristics: functionality, usability, as well as quality in use.As part of this proposal, the PROYEVA computational tool is included, which allows the practical application and testing of the evaluation model created, in innovation and invention competitions... allows to generically evaluate the quality of the projects-products before in the mentioned competitions.

Moquality report, Technical evaluation of projects-products, Creativity contest, Quality in use, External metrics

Resumen

Se presenta el Sistema PROYEVA, basado en estándares internacionales (ISO/IEC 9126, 14598, IEEE 1061) y modelos mexicanos (MECHDAV, MECRAD), que permite un análisis comparativo de los diferentes proyectos y productos participantes en concursos de innovación e invención. Se basa en la determinación del grado de cumplimiento de las siguientes características de calidad: funcionalidad, usabilidad, así como calidad en uso. Como parte de esta propuesta se incluye la herramienta computacional PROYEVA, que permite la aplicación práctica y prueba de los modelo de evaluación creado, en concursos de innovación e invención... permite evaluar genéricamente la calidad de los proyectos-productos antes en los citados concursos.

Informe Moquality, Evaluación técnica de proyectos-productos, Concurso de creatividad, Calidad en uso, Métricas externas

Citation: VARGAS, Laura, GUTIERREZ, Agustín, EDGARDO, Felipe, VARGAS, Vanessa and PERALTA, Jorge. Quantitative methodology and mobile technology to evaluate the quality in use of projects-products-services in innovation events through metrics. Journal-Business Administration -Marketing; Accounting. 2021. 5-9:29-38.

† Researcher contributing as first author.

Introduction

At present it is not easy to face making a judgment on projects that belong to disciplines that are not mastered or to areas that do not correspond to the evaluator's professional training. On many occasions, hasty and light decisions have to be made to determine the quality in use of a project based on subjective criteria, and that do not allow an objective evaluation of the different aspects that make it up.

A methodology and a technical evaluation model of the Quality of the Participating Projects in Innovation contests are proposed through the implementation of a Quality Metrics Plan and the use of software, which serve as support for the evaluators (jurors in certain contests) to issue a more accurate ruling. The PROYEVA model is presented, based on international standards [IEEE610,1994], [IEEE1061,1992], [ISO 9000-3,1991], [ISO/IEC9126, 1997], [ISO/IEC 14598,1998], [ISO 9001,1994], Project SQUARE [ISO 25000,2005], [SUMI, 2000], as well as in other Mexican models (MACS [Gutierrez, 2002], MECHDAV [Vargas-Gutierrez, et al, 2004, 2005, 2006], MECRAD [Vargas, et al, 2008]).

There are various standardized models that serve as a guide for organizations in measuring characteristics that allow them to access a high level of quality in their products and projects.

It is necessary to adjust them, theoretically and practically, to obtain a qualimetric model for the purpose of evaluating and measuring quality characteristics. In these cases, a comparative analysis of several products and projects serves to help decide which one will be selected as the best in terms of its quality in use.

A project can be defined in terms of its distinctive characteristics. Projects are developed at all levels of the organization. These can involve a single person or thousands.

Criteria for the elaboration of projects

1. The project must be realistic above all.

2. Estimate the experimental skills you have in the selected field.

3. Know the basic principles, involved in the project.

4. The estimated time for the complete completion of the project.

5. Lavailability and commitment to work on the project.

6. Analyze if there is the possibility of having external support in the consultancy of the project.

7. Consider the innovative aspect, since the construction of apparatus can be new in its design or because it constitutes a modification of an existing one.

8. Take adequate safety measures to avoid accidents.

9. Thorough elaboration of the protocol of the project to be developed.

10. Estimate of the approximate cost of the project.

Theoretical foundations

Due to the importance of having high-level professionals, teachers, developers and people capable of providing a technical scientific benefit to society, events are created through which creative activity is promoted. This is how creativity contests appear, where projects developed by different organizations and companies are presented and demonstrated. The following description shows how a project should be elaborated in a general way [Solleiro,1994].

The problem

Lo First of all, what is of interest is to know what will be investigated: Why? What for? What is the value or importance of the fact or phenomenon to be investigated? In addition, if the problem to be solved has criteria of priority, novelty, opportunity, conformism or behavior. This statement is subdivided into the following parts:

- Descriptive title of the project.

- Formulation of the problem.

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- Research objectives.

- Justification.

Limitations

Marc reference

It is important to distinguish in the project the close relationship between theory, the research process and reality, that is, the environment must be defined. The research can initiate a new theory and point to different points of view, paradigms or hypotheses; reform an existing one or simply define more clearly, existing concepts or variables that cause some kind of discrepancy or errors in their application. Within the frame of reference, the following points should be mentioned:

- Theoretical underpinnings.

- History of the problem.

- Elaboration of hypotheses.

- Identification of the variables.

Methodology

The methodology to follow is not necessarily so strict or marked and in some types of projects guidelines are given to follow; For example, in a project oriented to the administration, it will not necessarily have to follow the same methods or techniques for its elaboration as a project of a technological nature. Within the general form of project development, the following points are considered in its methodological part:

- Design of data collection techniques.

- Population and sample.

- Analysis techniques.

- Tentative analytical index of the project.

- Field work guide.

- Administrative aspects

They are of greater importance in those projects that need to obtain financing, total or partial, of a political, economic or social nature. At this point, aspects such as:

There must be a Technical Committee, which reserves the right to evaluate and admit the ideas presented and not admit ideas that are not aligned with the specific objectives and with the spirit of the contest initiative in question. The participation of a group or any of the members and the number of ideas to present has no restrictions, that is, several innovative ideas can be presented by the same group or by some members of the group.

Contest policies

- Human Resources.

- Budget.

- Schedule.

References

These references are important to consult previous works and create the state of the art in the respective areas of each project, as well as to know the origin of the relevant information related to them.

Project competitions

Anyone who has an innovative idea to turn it into a development project can participate in them. The idea should preferably be supported or grounded technologically and may be the result of the inventiveness of a person or a group.

Projects can be of various types: scientific research, technology development: new products, processes or services, or improvement of existing ones, etc. These must be feasible to be incorporated into the national or international production environment and must also meet each and every one of the requirements indicated below:

- Lot obtaining new products, processes and services, or improving existing ones, considering an effective technological transfer of the results, from the institutions that carry out research and development to the producers and marketers.

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- These entities that carry out research and development activities in the country, with companies and other national or foreign entities, producers and marketers of products, processes and services, must contribute to raising the knowledge and level of human resources and infrastructure with which the country counts, in the area of science and technology.

- A higher knowledge and better infrastructure scientific and technological and this sand translate and technology businesses that benefit institutions proponents a productive business that increase the competitiveness of and companies gene Ren be significant economic and social benefits for the country.

- Research and development must allow the obtaining of innovations that generate technological and productive businesses that produce significant economic and social benefits for the country. Its results and expected innovations must have a positive or neutral environmental impact.

- These Resulting innovations must contribute to solving internal problems or deficiencies and/or satisfy or create internal or external markets and must be clearly differentiated from alternative options that may already exist in the national and international market or that are of public knowledge, which will be available in the medium term.

- Especially, the project will be evaluated and qualified in terms of:

- Generation of new scientific knowledge.

- The generation of new and/or improved technologies and their potential uses (patents, technological packages).

- The generation of new lines of research and development.

- The carrying out of project activities by professionals who carry out doctoral, post-doctoral and master's degrees, preferably in the facilities of the participating companies.

- The quality of scientific hypotheses and technological hypotheses, methodologies, results and their coherence.

- The quality and rigor of the formulation of the project: its fundamentals, the analysis of the national and international state of the art related to scientific knowledge, technology and innovations, search for patents that demonstrate the non-existence of competing products, processes or services , analysis of alternative options to the innovation(s) and its competitive advantages in relation to the alternative options, analysis of related projects presented and/or approved with the contribution of public funds.

- The level of characterization of the innovation(s) and its level of development.

- The quality of the analysis of the applicable national, foreign, or international regulations that are related to the project.

National prototype competition today

The exhibition in contests of projects of a technological, scientific nature and technical prototypes has its peak since the 1990s. Creativity contests are of great importance both for the institutions that opt for an award, as well as for important companies and entrepreneurs who are looking for new ideas and services that provide added value to their productive management.

State of the art

An exhaustive investigation was carried out about the possibility of the existence of systems (software) for the evaluation of projects in terms of quality, focusing on this important issue in quality contests, such as creativity contests or where a project is evaluated. project for technological, scientific, social, cultural, environmental purposes, to be approved by and for society.

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The investigation yielded some results since the subject exists but the beginnings are weakly founded and with another approach; for example, there are specialized master's degrees in the field of quality project evaluation, which allow determining the magnitude of the evaluation results, which are a fundamental element of cost-benefit and cost-effectiveness analyses, widely used in evaluation of projects [Solleiro,1994]. No courses were found that prepare and certify juries to evaluate projects that participate in creativity contests, to direct the aforementioned benefits, and better prepare people as evaluators of the quality of projects.

For now there are some software that are dedicated to the evaluation of projects. Among others are: EvalAs [EvalAs, 2000] (Software for the Evaluation of Productive Investment Projects), the objective of this software is to determine, in the best of cases, the financial feasibility; It can also be used to determine the profitability of industrial, forestry and agricultural production projects. Intecplan [Intecplan, 2004], which only performs the evaluation of Investment Projects, both references have a totally different approach to the purpose of evaluating projects in order to obtain a score to determine the best of their kind in creativity contests. (SEPI)

SEPI allows you to register business units and associate investment projects with them. Each investment project will in turn be able to record the necessary inputs to be able to measure and estimate the degree to which the economic objectives set within the project will be achieved, executing profitability projections that will serve as the basis for determining the economic viability of the project.

The only antecedent as a computational tool found, are the articles presented "Software for the evaluation of the quality in use of projects through a plan of external quality metrics" [Vargas and Peralta, 2006], which showed a protocol of initiation of this research.

Project description

To evaluate projects-products participating in creativity, innovation and invention contests, the application of a metric plan is required within the framework of a methodology and a technical evaluation model of the quality of software products for visual environments, MECHDAV, from which this proposal is derived to evaluate products and projects participating in the contests, within a software in a visual environment.

This program of metrics will be reflected in a new model, with its methodology and evaluation software, PROYEVA - Methodology and Model for Technical Evaluation of the Quality of Projects participating in creativity contests, which will be able to guide the results of the evaluations obtained on the quality in use of a project, and propose actions to improve the process; In addition, it will allow the established process to be controlled, to ensure the quality of the evaluation of these projects to support the juries in the creativity, innovation and invention contests.

Oriented to the quality of products and projects

It is important that the measurements of the projects (products) can be done in an easy and cheap way, and that the result of the measurement can be interpreted in the same way. The way in which the quality characteristics have been defined does not allow them to be measured directly, so it is necessary to establish metrics that correlate these characteristics in a product (project). Each quantifiable internal and external attribute interacts with its environment and correlates with a characteristic that can be established as a metric. The basis on which the metrics are selected will depend on the priorities of the product-project and the needs of the evaluator.

A set of product metrics that can be applied to the quantitative assessment of project quality is examined. In all cases, the metrics represent indirect measures, and quality is never really measured, but some manifestation of it. The complicating factor is the exact relationship between the variable being measured and the quality of the product, which can be measured based on the classification of quality metrics in use.

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Quality in use is the user's point of view of the quality of a system (project or product) and is measured in terms of the result of its use before the properties of the product itself; it is the combined effect of the quality characteristics of the product for the user.

Methodology

For the development of the methodology, there are the following phases:

Requirement's analysis

According to the data collected by the potential users of the products, different people who have participated, both as a jury and as competitors in creativity project contests, have provided part of the requirements, which, when analyzed, refined and synthesized, provide the components and parameters of the system to be implemented.

Process applied evaluation code

To evaluate the quality of a product, the results of the evaluation of the different characteristics need to be summarized. The evaluator must prepare a procedure for this, which separates criteria for different quality characteristics, each of which can be in terms of individual sub-characteristics or lean towards a combination of them. The procedure includes other aspects such as:

Evaluation specification. This part specifies the scope of the measurement, that is, the characteristics and sub-characteristics established in the proposed quality model, and which determine the starting point for the selection of attributes and metrics proposed for the evaluation. Metrics for evaluation. They are grouped according to the corresponding sub-characteristic and attribute and will serve to carry out the evaluation.

Measurement types. They are used to compare the quality in use of the various products-projects to be evaluated. They are represented by discrete evaluation variables of two types: binary discrete elementary evaluation variables and discrete multilevel evaluation variables.

Range of levels for the metrics. The numerical scale to rate each of the metrics is Figure 1.

Value	% Fulfilment	Meaning / Interpretation	Range
1.0	90.100	Excellent	A
0.8	70-89	Satisfactory	B
0.6	50-69	Acceptable	C
0.4	30-49	Poor	D
0.0	0-29	Unacceptable	E

Figure 1 Ranges of metric levels
Source: [Vargas, et al, 2008].

Capturing the results of the evaluation of the quality of the product-projects, both partial and total, is not an easy task, so simple and understandable formats must be chosen to achieve a rapid and reliable assessment of the quality of the different representations of the products. Projects: For this reason, formats such as checklists and simple relationship tables have been chosen. In Figure 2 it is shown in its 42 Characteristic-Factor / Subfactor combinations / / Attribute / Metric, used for the undergraduate and graduate academic level.

Each component of the requirements of which are represented by a metric, according to the application of the possible model, which corresponds to the one with which the project is most related. The projects participating in creativity contests can be classified as:

1. Scientific – Technological.
2. Health and Environment.
3. Socioeconomic, Administrative and Educational.
4. Craft and Cultural.

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Característica / Factor		/ Sub característica / Sub factor	/ Atributo / Atributo	/ Métrica / Métrica
1.1.1.1	F1	/ Proyecto 1	/ Científico-tecnológico	/ A
1.1.2.1	F1	/ Proyecto 2	/ Salud y medio ambiente	/ B
1.1.3.1	F1	/ Proyecto 3	/ Social-Económico-Educativo	/ C
1.1.4.1	F1	/ Proyecto 4	/ Artesanal	/ D
1.1.1.1.	F2	/ Identificación	/ Definición problema	/ A1
1.1.2.1	F2	/ Identificación	/ Hipótesis	/ A2
1.2.1.1	F2	/ Objetivos	/ General	/ B1
1.2.2.1	F2	/ Objetivos	/ Específicos	/ B2
1.3.1.1	F2	/ Alcances	/ Técnicos	/ C1
1.3.2.1	F2	/ Alcances	/ Socioeconómicas	/ C2
1.4.1.1	F2	/ Limitaciones	/ Técnicas	/ D1
1.4.2.1	F2	/ Limitaciones	/ Socioeconómicos	/ D2
3.1.1.1	F3	/ Originalidad	/ Invención	/ A
3.2.1.1	F3	/ Originalidad	/ Innovación	/ B
3.3.1.1	F3	/ Originalidad	/ Otros	/ C
4.1.1.1	F4	/ Factibilidad	/ Técnica	/ A
4.1.2.1	F4	/ Factibilidad	/ Socioeconómica	/ B
5.1.1.1	F5	/ Justificación	/ Técnica	/ A
5.1.2.1	F5	/ Justificación	/ Socioeconómica	/ B
6.1.1.1	F6	/ Formalidad	/ Nivel	/ A
6.1.2.1	F6	/ Formalidad	/ Grado complejidad	/ B
6.1.3.1	F6	/ Formalidad	/ Modelo matemático	/ C
6.1.4.1	F6	/ Formalidad	/ Modelo gráfico	/ D
7.1.1.1	F7	/ Registros	/ Patente	/ A
7.1.2.1	F7	/ Registros	/ Industrial	/ B
7.1.3.1	F7	/ Registros	/ Modelo de Utilidad	/ C
7.1.5.1	F7	/ Registros	/ Trazado Circuitos Integrado	/ E
7.1.6.1	F7	/ Registros	/ Marca	/ F
8.1.1.1	F8	/ Nivel	/ Cobertura	/ A
8.1.2.1	F8	/ Nivel	/ Exposición	/ B
8.1.3.1	F8	/ Nivel	/ Concurso	/ C
8.1.4.1	F8	/ Nivel	/ Foro	/ D
9.1.1.1	F9	/ Producto	/ Terminado	/ A
9.2.1.1	F9	/ Informe	/ Completo	/ B
9.2.3.1	F9	/ Informe	/ Manuales	/ D
9.2.4.1	F9	/ Informe	/ Maquetas	/ E
10.1.1.1	F10	/ Presentación	/ Dominio del Tema	/ A
10.1.2.1	F10	/ Presentación	/ Diapositivas	/ B
10.1.3.1	F10	/ Presentación	/ Video	/ C
10.1.4.1	F10	/ Presentación	/ Animación	/ D

Figure 2 PROYEVA model

Second - once the location area of the project has been chosen, a general procedure proposed by the PROYEVA model (derived from MECHDAV) is proposed by 10.

A characteristic (factors), 26 sub-characteristics (sub-factors), 42 attribute-metrics, which is fully represented by type I., then (a few less metrics) by type II, III, and finally IV, to which several component elements of the model are needed (subfactors and attributes-metrics).

Third, each category or type of project is assigned a score, according to the percentage of compliance with the PROYEVA model, for each and the combinations factors / subfactors / attributes / metrics that corresponds to it, depending on the type of project. The first score assigned is the first metric to be calculated, which is given as follows for each of the types: I =1.0, II= 0.9, III= 0.8, IV= 0.7.

Figure 3 shows a subset of the PROYEVA model, it refers to the type of health and environment project, used to evaluate projects at the primary level and shows the metrics that intervene at this level and in that category.

Critic proposals for this model

To obtain the final grade for a competing project in any category, for each jury, PROYEVA calculates the metrics (equations) of each of the specified points, depending on the type of project to which it corresponds: the value assigned in each evaluation is combined with the rest of each fraction of the evaluated factor, accumulating the partial values, with which the result of each of the 10 factors is calculated. Finally, an equation is applied, which represents the evaluation of all the factors, to obtain the opinion granted by a jury, for the contestant project.

The final score of a project will be the combination of the opinions given by all the juries that take part.

Final evaluation report

When the respective values of the evaluation of the chosen project are obtained, as well as its percentage of quality compliance, the final report of the evaluation is generated, where definitive results and the percentage of compliance are given. A scheme is provided where the points are shown, both where the product-project stands out in quality and where it does not reach it.

It also determines what level of quality it achieves according to the points discussed, and, if required, some modifications are recommended so that this project-product is accepted as a quality project, or if it should be definitively modified and improved. Figures 5, 6 and 7 show the main screens that describe the operation of the system.

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Característica Factor	Subcaracterística Subfactor	Atributo Atributo	Métrica Métrica
1.2.1.1	Proyecto 2	Salud	B
2.1.1.1	Identificación	Definición problema	A
2.2.1.1	Objetivos	General	B
2.3.1.1	Alcances	Técnicos	C
2.4.1.1	Limitaciones	Socioeconómicos	D
3.1.1.1	Originalidad	Invención	A
3.2.1.1	Originalidad	Innovación	B
3.3.1.1	Originalidad	Otros	C
5.1.1.1	Justificación	Técnica	A
7.1.1.1	Registros	Patente	A
7.1.2.1	Registros	Indautor	B
7.1.6.1	Registros	Marca	F
8.1.1.1	Nivel	Cobertura	A
8.1.2.1	Nivel	Exposición	B
8.1.3.1	Nivel	Concurso	C
9.1.1.1	Producto	Terminado	A
9.2.1.1	Informe	Completo	B
9.2.4.1	Informe	Maquetas	E
10.1.1.1	Presentación	Tema	A
10.1.3.1	Presentación	Video	C

Figure 3 Subset of the PROYEVA Model Used in competitions at the primary level

In Figure 4, the sample of the documentation of one of the 42 combinations mentioned.

Característica: Factor 9 (F9) Documentación presentada.
Sub característica: Sub factor 9.2
Informe.
Atributo: 9.2.2 Prototipo.
Métrica: 9.2.2.1 Prototipo final completo
Objetivo: Determinar el nivel de la completitud del prototipo final requerido por el usuario del producto del proyecto.
Método: Analizar cada parte del prototipo para determinar la completes que debe contener que debe de contener para que el prototipo final se considere completo.
Fórmula: X=C
Medidas: C= Nivel de completitud del prototipo final **Evaluación:** E(x)= {(0,0), (0.4,40), (0,6, 60), (0.8,80), (1,100) } **Interpretación:** Nivel de completes del total de las partes del prototipo
Final 0<=X<= 1; lo más cercano a 1 es lo mejor.
Fuente de referencia: MECHDAV.

Fórmula para calcular el puntaje de la característica total Factor 9 (F9)
(A, B)= { (0.4, 40), (0.8, 80), (1,100)}, D= { (0.0), (1,100) }

Fórmula: $\overline{X} = A^{x} [C+D]^{*}B$

Figure 4 Documentation of one of the 42 metrics used within PROYEVA

Results, conclusions, and future work

The project is finished in its first phase, which covers the complete model and its methodology for the technical evaluation of the quality of the projects participating in creativity contests through the application of quality metrics in use (PROYEVA). The first prototype of the software was also developed, which is the proposed tool for a jury to efficiently evaluate the quality in use of the participating projects in a given creativity and innovation contest, with four intellectual property registries.

Tests are currently being carried out on the second PROYEVA software prototype with new registrations or software patents.

The software will allow to give a very generic technical evaluation, based on the quality in use, the creativity and the application of the project. The evaluation focuses on very general aspects, so an opinion can be issued on any project and at any level, in order to give a reliable decision as a jury of creativity, innovation and invention contests. Complementary manual evaluation formats are provided for these contests, for various juries, for various applications (academic levels: primary, secondary, high school, undergraduate and postgraduate, and at each of these levels, introduce a craft category).

Figure 5 Welcome screen and Start to the PROYEVA system

Figure 6 Evaluation view with the points to be evaluated of the ruble Statement of the Problem

These manual evaluation formats are used for the traditional evaluation of each project, in each of the stages. At the end of evaluating each project, each point can be captured in the PROYEVA system, so that the results are given automatically, quickly and easily, avoiding the known setbacks and customary deliberations.

ISSN 2531-3002

Figure 7 Results view of evaluation of a project

This prototype is proposed for the creativity contests that are held in: the National System of Technological Higher Education, for the state contests organized by the different universities, for the national contests organized by the National Women's Institute, National Linkage Contests and Exhibitions of ANUIES Projects, among others. The English version PROJEVA is available for innovation events abroad (Figures 8, 9, 10 and 11).

Figure 8 Evaluator data repository, for jury login, in PROJEVA for competitions abroad (English version)

Complementary manual evaluation formats are provided for these contests, for various juries, for various applications (academic levels: primary, secondary, high school, undergraduate and postgraduate, and at each of these levels, introduce a craft category). These manual evaluation formats are used for the traditional evaluation of each project, in each of the stages; At the end of evaluating each project, each point can be entered in the PROYEVA system, so that the results are given automatically, quickly and easily, avoiding the known setbacks and customary deliberations.

Figure 9 Selection screen of the academic level of the project to be evaluated, in PROJEVA for competitions abroad (English version).

Figure 10 Start screen of PROJEVA evaluation items for competitions abroad (English version).

As a finished software product) it can be installed in a multi-user environment, in a WEB environment (client server architecture), with mobile technology.

Figure 11 View of the results of the evaluation of projects with PROJEVA for competitions abroad (English version)

ISSN 2531-3002

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The model can be adapted for the new project-product-service contests that are emerging in the different government and state agencies, among other contests, such as the project contests of the technical conferences of the Association of Petroleum Engineers of Mexico, section Tamaulipas.

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ISSN 2531-3002

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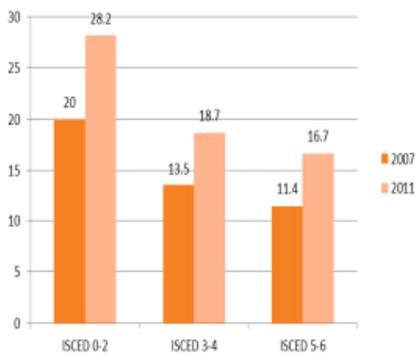

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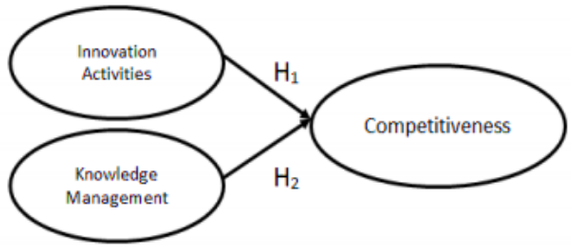

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