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In Pro-Research, Teaching and Training of human resources committed to Science. The content of the articles and reviews that appear in each issue are those of the authors and does not necessarily the opinion of the editor in chief.

In Number 1th presented in Section of Education an article *Analysis of ways of thinking in the approach to systems of homogeneous linear equations* by BARRERA, Jaime, BAUTISTA, Lilia and PÉREZ-CAMPOS, Antonio, in Section of Crowdsourcing an article *Tutorial for life* by VALENZUELA, Teresa, LEÓN, Yolanda y LUNA, Leticia, in Section of Operation of Academics Corps an article *Academic bodies in Public Schools in the State of Mexico* by VELÁZQUEZ, Héctor, GONZÁLEZ, Lucio, REYES, Basilio, in Section of Regional Development an article *Human capital management for sustainable agribusiness from the perspective of the securities* by CERVANTES-ROSAS, María de los Ángeles, CONSTATINO-LEMUS, José Mallel` and CARRANZA-ORTEGÓN, Gabriela``, with adscription in the `Universidad de Occidente, Universidad de Occidente Unidad Guasave, ``Universidad Autónoma de Guadalajara, ````Universidad Autónoma de Guadalajara, in Section of Fiscal an article *Professionalism and financial developments in manufacturing SMEs* by QUIJANO-GARCÍA, Román Alberto, AGUILAR-TELLO, Jorge Raúl y ARGUELLES-MA, Luis Alfredo, with adscription in the Universidad Autónoma de Campeche, in Section of Architecture an article *Habitat improvement in Chipilo of Francisco Javier Mina. Puebla: Use of biogas as an alternative energy in the productive activity of dairy cattle animal house* by ARTILES-LÓPEZ, Dora María, DUEÑAS-BERRA, Laura Yanela and SANTIAGO-AZPIAZU, Gloria Carola, with adscription in the Benemérita Universidad Autónoma de Puebla, México, in Section of Networks an article *Loyalty index of students, a view from the Tesjo stage with data mining* by LÓPEZ-GONZÁLEZ, Erika, ALEJO, Roberto and VELÁZQUEZ, Juan.

## **Content**

	<b>Article</b>	<b>Page</b>
Analysis of ways of thinking in the approach to systems of homogeneous linear equations		81-86
Tutorial for life		87-93
Academic bodies in Public Schools in the State of Mexico		94-103
Human capital management for sustainable agribusiness from the perspective of the securities		104-109
Professionalism and financial developments in manufacturing SMEs		110-122
Habitat improvement in Chipilo of Francisco Javier Mina. Puebla: Use of biogas as an alternative energy in the productive activity of dairy cattle animal house		123-132
Loyalty index of students, a view from the Tesjo stage with data mining		133-139
<i>Instructions for Authors</i>		
<i>Originality Format</i>		
<i>Authorization Form</i>		



## **Analysis of ways of thinking in the approach to systems of homogeneous linear equations**

BARRERA, Jaime†\*, BAUTISTA, Lilia and PÉREZ-CAMPOS, Antonio

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### **Abstract**

This research to analyze the modes of thinking synthetic-geometrical, analytic-arithmetic and analytic-structural in Linear Algebra Sierpiska (2000), and approach in solving problems Homogeneous Linear Equations Systems and their relationship with concepts of linear independence, as well as strategies and present difficulties by students of the first semester. The study was done by writings and interviews, questionnaires applied in two stages. The first exploratory stage questionnaire was applied as a group as two different groups who were in linear algebra, then a student selected were interviewed. In a second phase an interview was applied to three successful undergraduate students who had recently completed Linear Algebra. The answers to problems were recorded on paper and interviews students were videotaped and audio for analysis. The research analysis shows that there are difficulties with the student in the transition of different modes of thinking, we see that the concepts are fragmented, does not exist in the mind of the student relationship among these are concepts without significance was also observed you do not have a clear concept of homogeneity, and there is difficulty in the transition on modes of thinking.

### **Modes of thinking, Linear Equations Systems, Linear Algebra.**

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**Introduction**

In recent decades they have developed research focused on the teaching of linear algebra by different groups of researchers in many countries, including a French group composed of Jean Luc Dorier, Aline Robert, Jacqueline Robinet, Marc Rogalski, Michele Artigue, Marlene Alves Dias; In Canada a group led by Anna Sierpinska, Joel Hillel and T. Dreyfus and the United States two groups, one composed of Gershon and the other by Ed Harel Dubinky with the theory (APOS). In the curricular part there is a group led by David C. Lay (Author of Linear Algebra and its Applications, Addison Wesley, 1994). In Mexico a group of researchers led by CINVESTAV-IPN Asuman Oktaç.

As a result of these studies it was concluded that any approach that is given to linear algebra (arithmetic, geometry, computational, axiomatic), difficulties in learning remain so they must accept that linear algebra is a complicated matter for many students. Jean Luc and Anna Sierpinska Dorier as leading researchers have identified two sources of difficulties in students: the nature of linear algebra as such (conceptual difficulties), and the kind of thinking required to understand linear algebra (cognitive difficulties), the which are not reported separately. As conceptual difficulties considered different types of languages and registers used in linear algebra, such as the formal language (Dorier, 1987), algebraic, geometric and abstract language Hillel (2000) also records charts, tabular and Pavlopoulou symbolic, (1993), and cognitive difficulties as regards cognitive flexibility-Dias Alves (1998), trans-level object of thought Sierpinska (1999) theoretical and practical thought Sierpinska, (2000).

This paper aims to identify the challenges and strategies that have undergraduate students to travel on different modes of thought into systems of homogeneous linear equations. In equations (1), (2) and (3) equations SELH and their correspondents ranges are shown in Figure 2 and its graphical representation.

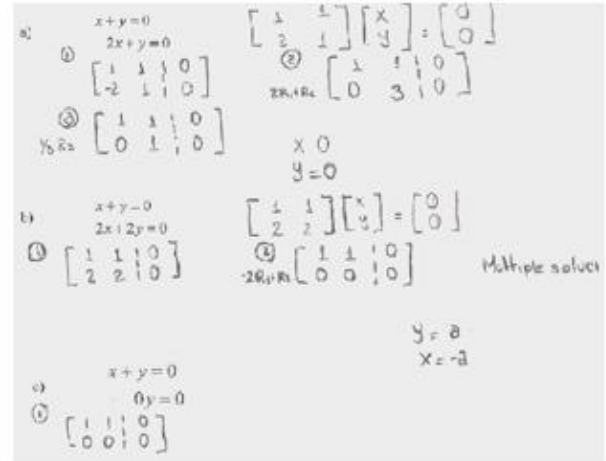


Figure 1 Responses from students

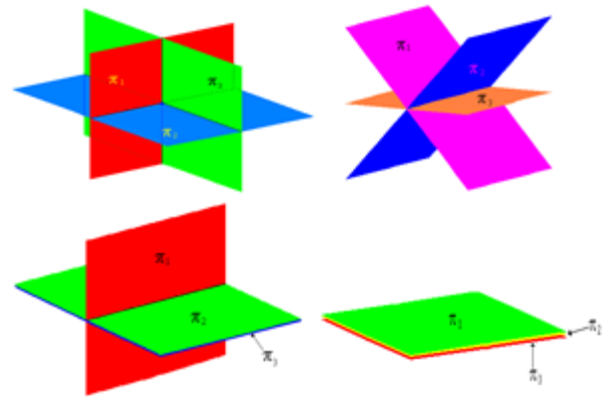


Figure 2 Graphical representation of some SELH

$$\begin{aligned} a_{11}x - a_{12}y + a_{13}z &= 0 \\ a_{21}x + a_{22}y + a_{23}z &= 0 \\ a_{31}x + a_{32}y + a_{33}z &= 0 \end{aligned}$$

(1)

Range A is three

$$\begin{aligned} a_{11}x - a_{12}y + a_{13}z &= 0 \\ a_{21}x + a_{22}y + a_{23}z &= 0 \\ a_{31}x + a_{32}y + a_{33}z &= 0 \end{aligned} \quad (2)$$

Det A = 0 and the rank of A is two

$$\begin{aligned} a_{11}x - a_{12}y + a_{13}z &= 0 \\ a_{21}x + a_{22}y + a_{23}z &= 0 \\ a_{31}x + a_{32}y + a_{33}z &= 0 \end{aligned} \quad (3)$$

## Methodology

This section of the research methodology is described, in which one can distinguish two phases, which have been carried out with tools, methodologies of quantitative and qualitative analysis. We begin by describing the objectives. The research was carried out with senior students in Pachuca Institute of Technology, to the race of Civil Engineering and Industrial Engineering.

The overall objective is to analyze the ways synthetic-geometric, analytic-arithmetic and analytic-structural Sierpinski (2000) thinking, difficulties and strategies that have top-level students to solve systems of linear homogeneous equations and concepts related with the structural part of linear algebra. The analysis of the interviews and questionnaire identifies the difficulties and strategies presented by the students.

We can distinguish two phases, exploratory, which consisted of applying a questionnaire to two groups of Engineering Pachuca Institute of Technology.

One of the careers of Industrial Engineering with a total of 13 students and another group of Mechanical Engineering with a total of 8 students who passed the course Linear Algebra and later an interview to a student selected from the same groups.

In the second stage interviews were applied to two successful students of the Engineering who were in differential equations and had approved the matters Vector Calculus and Linear Algebra.

The documentation for the evidence in the analysis was taken from the writings in their worksheets and audio and video recordings made during the course of the interview students. All students who participated in the first phase of the research had previously studied at least one college course were finalizing Vector Calculus and Linear Algebra course. In the second phase the students interviewed were selected based on taste for mathematics and the success they have for their good grades in math, students interviewed had half a year of study vector calculus and linear algebra.

## Results

### Some of the results are

Evidence that the analytic-arithmetic thinking takes precedence in the respondents because the solution of the systems, obtained by applying a reduction method, when it is questionable whether there would be another way to tell if the system is trivial or no solution (line shown 61 and 63), the respondent says that the only way you taught (line 64), not the characteristics of the system relates to the solution and this is reflected in subsection c) of the same problem where no response, although sometime referred to in subparagraph b) the solution is manifold because the equations are multiples of each other.

Again he has trouble passing the arithmetic analytic analytical-structural thought, subsection c) thought, possibly due to having  $Oy = 0$ , and therefore does not express his solution, although he was again leads (online 69 and 71), can not express the solution as in paragraph b). As shown in Figure 1.

## Conclusions

Product research about teaching and learning of linear algebra are not, in general, statements like, "This is how to teach linear algebra resulting in a better understanding by students of the basic concepts of the theory and a better performance on standardized test questions ", complemented by classroom materials, as: textbooks, software, etc. Such statements and steady supply in the market, textbook linear algebra, tutorials and software, are generally not based on research. In fact, the most reliable research results are, in a sense, "negative" in nature. Explains to some extent why many students fail in linear algebra courses, show why some innovative approaches in teaching linear algebra can fail. These results lead to some "well-founded Recommendations" or "good advice" regarding the practice of teaching, but the council should not be confused with a foolproof recipe; in fact, the recommendations are only conjectures that are still liable to be questioned.

This work tried to pinpoint some reasons why many students find it difficult to learn linear algebra. They are:

1. The axiomatic approach in linear algebra appears in many students. All linear problems within the reach of first-year college students can be solved without using the theory of vector spaces. Therefore, this theory has little chance of being perceived as an intellectual need for these students.

Students can "recognize" its existence, or even "Appreciate" and meaningful information, but the theory is unlikely to become "cognitive supply" in the minds of students. It will be considered superfluous and vain to many students.

2. Linear algebra is an "explosive compound" of languages and systems of representation. There is a geometric language of lines and planes, algebraic language of linear equations, the n-tuples and arrays, the lenguaje of "Abstract" of vector spaces and linear transformations. There records "Graphic", "Tabular" and "Symbolic" the language of linear algebra, Figure (2). There is also representations "Cartesian" and "Parametric" subspace. Teachers and texts move between these languages, records and modes of representation without considering the need for conversions and talk about their validity. They seem to assume that these conversions are "Natural" and obvious and need no conceptual work at all. Linguistic and epistemological studies and observations of students demonstrate, however, how these claims can be misleading.

3. Linear algebra is very demanding from the cognitive point of view. At the most general level, an understanding of linear algebra requires a fair amount of "cognitive flexibility" among the different languages so that they can move freely (eg The language of matrix theory and language of the theory of vector spaces), points view (Cartesian and parametric) and semiotic registers. The understanding of linear algebra also requires students in identifiable conceptual structures encapsulate a substantial range that was encapsulated previously as individual objects and actions on these objects in the conceptual structures identifiable. (For example, the functions must be seen as objects themselves, elements of vector space procedures instead of assigning numbers to other numbers).

In addition, the understanding of linear algebra requires the ability to use the "theoretical thinking." Indeed, it is essential to have a means of control over the ways of thinking, in the same way that the "Insights" and the characteristics of practical thinking mental image. It is however the "practical thinking" necessary to avoid a situation where the linear algebra is nothing more than a strange, secret and formal language that can be written but can be used to think.

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**Tutorial for life**

VALENZUELA, Teresa\*†, LEÓN, Yolanda and LUNA, Leticia

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**Abstract**

This article present the study of impact of mentoring done in blended way to support students of Administration degree in Centro de Reinsertion Social in Pachuca, Hidalgo. Two groups of internal students were tutored from January 2013 to June 2015, in addition there was applied some motivational and trainer activities like talks, meetings and artistic shows. We worked with the certainty that a good mentoring is beneficial to the students, especially when they live in a difficult and hostile environment. The instruments used to demonstrate the results were the Beck Depression Inventory applied to the 15 students in the initial and final moments of mentoring and assessment survey applied only at the end. The study results show that the impact of mentoring they received was positive, decreased depression and increased self-esteem and desire to excel. Consequently, academic performance improved dramatically. It was instrumental tutor's commitment to consider for professional development and comprehensive training is necessary to provide the guidance and tutored required and in a special way, in this environment, decent treatment as a human being.

**Mentoring, depression, self-esteem, distance learning**

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**Introduction**

The mission of institutions of higher education, to meet the training needs of the students, involves not only the attention of academic and professional, but also personal development (Del Rincon, 2000) aspects.

In this regard, a key element in the development of learners is mentoring, understood as the "process of group or individual support that the tutor gives students during their stay in the technological institute for the purpose of contributing to their comprehensive training and influence institutional goals related to educational quality; increase terminal efficiency rates, lower failure and dropout rates "(Guideline, 2011: 2).

In the performance of the guardian, the relationship established with students by providing academic, professional and administrative information, as well as motivate and counsel is fundamental. The tutor accompanies, directs, proposes alternative ways if the required tutoring and warns of complex or conflicting situations. In addition, the tutor as a person is a carrier of values and evidence on each contact, suggestion or proposal (Schmid, 2004).

To achieve this, you must take special care to respect the conditions of the social context. A good tutor serves students with care and commitment, in any situation where they are.

In search of the best results in both the educational work and some tutorials activities are designed various strategies, such as teaching in small groups (EPG), where students are encouraged to move from being subject receiver teaching to active learning (Exley, 2007) subject.

Cooperative learning (AC), which requires that students participate actively and directly to achieve common and individual objectives, sharing, trading and re-evaluating their learning, the protagonists of their own growth, or flexible learning (AF), which involves changes in class, in the educational space and the roles of teacher and student.

In the tutorial, as in the whole educational process, proper management of ICT facilitates fluid, relevant and timely communications. To achieve success in education, these technologies must answer a thorough planning of the training process; thus, will enable constructive approaches that enhance the interactive and communicative. (Guzman, 2011).

The use of ICT has expanded comprehensively in education. The possibilities of communication in virtual environments that allow the use of platforms has made distance education (ED) a current no future reality.

For Schmid, (2004), "the conditions of flexibility and customization significance of distance education processes are largely in the hands of the guardians". Also in this mode, the guardian is appointed by the institution to establish contact with the student and, through a personal relationship, facilitate the development of their intellectual potential and communications professor.

In ED, the relationship established between the tutor and the student makes this increasingly assume greater control over their learning process and perceive that this control is a direct function of the quality of the exchanges with the mentor. The processes of interaction studies conducted online among students and between students and tutor.



The tutor is responsible for encouraging students to participate in online discussions, forums or through email exchanges. This article provide mentoring experience through the virtual platform Moodle to two groups of students from ED Pachuca Institute of Technology (ITP), located within the Centre for Social Reinsertion (Cereso) Pachuca, Hidalgo shared, analyzing and presenting academic and personal impact on them.

The hypothesis that motivates this study is a tutorial accompanying mood improves conditions for students, resulting in improved academic and social performance.

Important aspects of tutoring and academic problems, administrative and personal nature are presented, and described how they were addressed and resolved some of them as complicated as it is a Cereso context. They rated through a psychological test results and an opinion poll presented.

### **Background**

Distance learning in the ITP began in August 2011, offering synchronous chat sessions and activities at set times and asynchronous tasks, using the Moodle platform. The first students were interns Cereso of Pachuca, the Bachelor of Administration, which also offers career in person at the institute. The second group started a year later in the same center.

The first premise of the new method was to act considering the Cereso internal unity as students, without any discriminatory prejudice, with the same obligations and rights as modality, knowing that their conditions are different.

Although academically demonstrated from the outset that there is great potential, there have been some situations that have affected the development of several students, who arrived in some cases desertion. In this situation, in January 2013 the tutoring program with two groups of the unit, a total of 16 students was implemented.

### **Development**

To comply fully with the charge as the following questions were raised: how to accompany the student to be detained in a criminal? how orientated them?, What kind of information they need?, How to motivated?, how to influence their comprehensive training?, how to help students solve their problems?, how to achieve coexistence in this difficult environment?

It was important to consider the guidance for tutors of the National Technology of Mexico, the Tutor Manual. This indicates that it is essential to start tutoring knowledge, their family situation, economic, social, health, context, among others.

After starting the program, mentoring appeared on the platform as another course, one hour for each group chat Saturday, participation forums and other activities resulting from the needs assessment, without ruling out the email messaging.

Mentorship to students two semesters obviously needs both group and personal problems as were different, mainly because of the diversity of situations of legal nature; in many cases the abandonment, family rejection, health problems, and others who come to cause the terrible risk of falling into depression.

Mentoring work was initiated through the means described above, providing related guidance educational model and its implications, with the institution and with the guidelines Version 1.0 for 2009-2010 curricula concern them, such as evaluation and accreditation subjects, operation and accreditation of social services, Accreditation of complementary activities, Operation mentoring program, distance education, operation and accreditation of residency and comprehensive professional qualifications.

For cases of handling emotions, stress, depression and teamwork classroom lectures were given with the participation of Institute staff on the following topics: Teamwork, communication, self-esteem, forgiveness and life direction.

Another motivating factor was the artistic participation in the Cereso, of representative huapango and theater groups, made up of students of the institute.

The number of people involved in this project is great. Table 1 shows the names of those impacted significantly.

Name	Form of participation
CP Teresa Valenzuela Rendon	Mentoring and management support
Ing. Erick Leon Olivares	ED coordination and support
Martha Leticia Moon LP Soberanes	Counseling and conferences
M.Sc. Salvador Pagola Martínez	Conferences
Francisco Espinoza Soberanes	conference
Dip. Rocio Tello Zamorano	conference
Joshua Guadalupe Hernandez	Course Office 2010
Rosario Hernandez Valencia	English course
ITP Theatre Group	Presentation
ITP Group Huapango	Presentation
Teachers distance education	Support for
Yolanda Leon M. C. Castelazo	Support for

**Table 1** Staff, students and volunteers who participated in an activity in the project.

To monitor progress and impact of the program on student interns, test called the Beck Depression Inventory (BDI) shown in Annex 1, February 2013 (starting mentoring) and in June 2015 was applied ( a half-year graduation of the first). This month the students a survey of discretion with the main elements that could influence changing moods and behavior (Annex 2) was also applied.

## Results

The results were highly satisfactory; only two cases of desertion, one discrepancy in vocational and another had a lack of adaptation to the environment in the period of tutorial work. Students of the first generation, mostly, are regular, and have won the first places in harnessing the race (including the modality groups) in several consecutive periods. In the second generation they lag some problems were taken into subject's mathematics and accounting situation has been resolved through peer tutoring

They have succeeded in providing guidance and support necessary to advance the grid, so that the regular students of the first generation are to be in the final semester, with great enthusiasm to finish the race.

The psychological and motivational impact was essential to achieve this. Tables 2 and 3 as well as Figures 1 and 2 shows the results obtained with the Beck Depression Inventory at the start and end times of the tutorial process, and is noticeable change in the different aspects involved in the test.

Student	Score	Depression level
1	9	normal ups and downs
2	15	Mild mood disturbance
3	31	severe depression
4	17	Mild mood disturbance
5	10	normal ups and downs
6	9	normal ups and downs
7	6	normal ups and downs
8	7	normal ups and downs
9	15	Mild mood disturbance
10	12	Mild mood disturbance
11	11	Mild mood disturbance
12	23	moderate depression
13	26	moderate depression
14	31	severe depression
15	27	moderate depression

Table 2 Results obtained in the IDB before tutoring

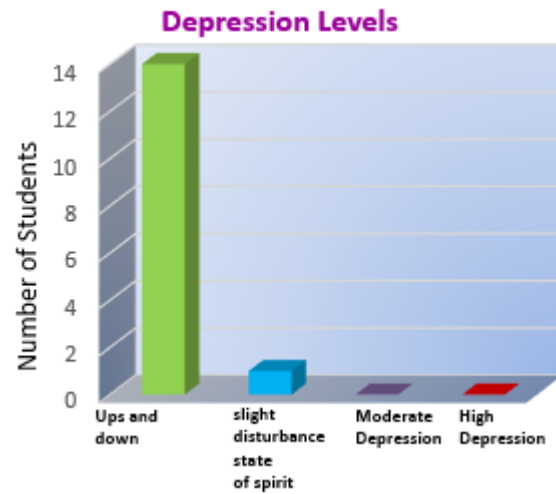


Figure 2 Results obtained in the IDB after the tutoring

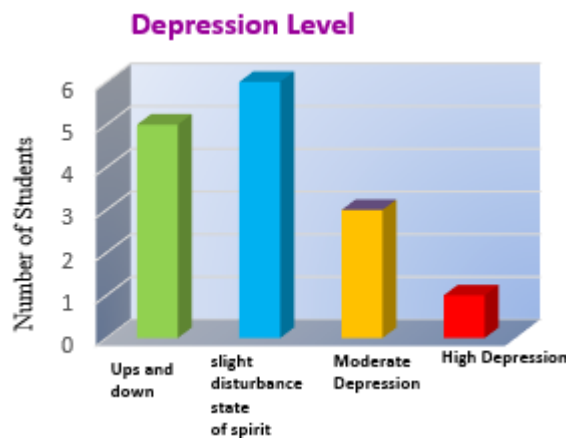


Figure 1 Results obtained in the IDB before tutoring

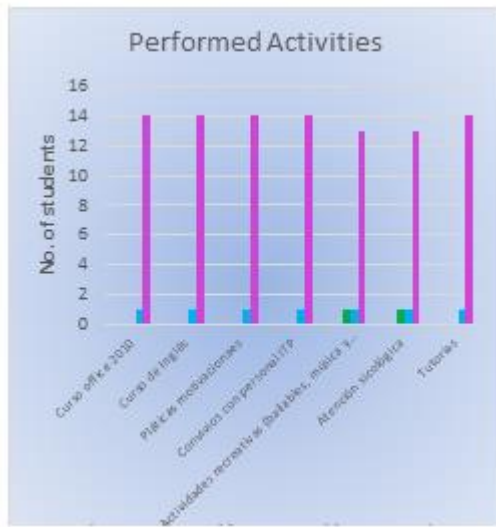
Student	Score	Depression level
1	0	normal ups and downs
2	0	normal ups and downs
3	1	normal ups and downs
4	9	normal ups and downs
5	0	normal ups and downs
6	3	normal ups and downs
7	7	normal ups and downs
8	4	normal ups and downs
9	0	normal ups and downs
10	0	normal ups and downs
11	1	normal ups and downs
12	0	normal ups and downs
13	0	normal ups and downs
14	15	Mild mood disturbance
15	2	normal ups and downs

Table 3 Results obtained in the IDB after the tutoring

Assessment survey indicates that most of the activities were appropriate, as shown in Table 4 and Figure 3. Highlight the impact of English course, the mentees considered very necessary; they expressed that the presentation of theater groups and huapango was a great motivation in the absence of healthy and happy distractions inside the penalty. Special mention in the opinion of all students, the work of the tutor and the close relationship that developed between her and the group.

activity	Bad	regular	Good	Very Good	Excellent
Course of Office 2010	0	0	0	1	14
English course	0	0	0	1	14
motivational talks	0	0	0	1	14
Together with ITP staff	0	0	0	1	14
Recreational activities	0	0	1	1	13
psychological care	0	0	1	1	13
tutoring	0	0	0	1	14

Table 4 Results obtained in the survey of appreciation after tutoring



**Figure 3** Results obtained in the survey of appreciation after tutoring

Additionally, employees who worked in some way with the project have said before meeting the group did not expect to find people so friendly, clean and very own behaviors. This gives confidence that has worked for a real reintegration of inmates into society students.

### Conclusions

Using the platform, chat, forum and email were excellent means to communicate, understand, monitor and partial or complete solution to some situations. It was the basis for personal accompaniment of the mentees, the weekly visits by the guardian, the involvement of school staff and students from different races, representative groups and foreign volunteers; all to support the tutorial activity.

Students feel more and more pleased with the presence of participants; they have accepted the messages of love, fellowship, equality, and are integrated as students of ITP, a spirit of belonging to the institution.

But most gratifying is to see the psychological impact on them, security in each of its actions, healthy and close coexistence between members of the group, the degree of confidence and gratitude to the ITP and the people that have been linked. Some claim that the school changed their lives; their faces of sadness and hopelessness have changed smiling, able to receive and make a joke, abandoning themselves to the rescue of its existence faces.

The purpose of mentoring has been magnified in their practice groups Administration academic program in a blended format of ITP, located in Pachuca Cereso. It has not been limited to accompanying their students to avoid censure or desertion, but has helped rescue their intellectual potential and, above all, human.

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**Academic bodies in Public Schools in the State of Mexico**

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**Abstract**

The article describes the characteristics of the academic bodies of the public normal schools of Mexico State, as well as the profiles of the teachers of these academic bodies. It is descriptive and explorative and is drawn from a larger project that aims to identify the formative process of the academic bodies of the public normal schools in México State. The question that guided this exploration was: What are the characteristics of the academic bodies of the public normal schools, and which profiles do its members have? The study was conducted in a quantitative manner, based on data collection from official sources of information, catalogues of academic bodies recognized by the PRODEP and databases of the Dirección General de Profesiones. The article shows that there are few schools with academic bodies, these academic bodies having limited membership and lains knowledge lines linked to teacher training. The professional training of teachers is the master's degree and they studied programs related to the science of education, in private schools. Few teachers possess a desirable profile; however the majority graduates with a master's degree.

**Academic bodies, normal schools, teachers**

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**Introduction**

The Professional Development Program for Teachers (PROMEP) attempts to professionalize the full-time faculty (PTC) of the Higher Education Institutions (HEI) to develop the capacities of research, teaching, application of knowledge and innovation and articulate in bodies academics. The intention is to generate a new academic community, able to transform their environment.

Since 1994 regular schools IES are considered, but not always worked as such. Some Public Normal Schools in the State of Mexico have managed to combine academic bodies and register to PRODEP, but what characteristics do these academic bodies? What profiles have their members? These are the questions that guided our study descriptive. We assume that the collegiate groups have a high degree of integration and its members have a solid background for research.

The answers to the questions are important as would the standard for other schools that have failed to combine academic bodies, have concerning the conditions of collective and profiles that comprise teachers.

The study is quantitative, it focuses on the twelve recognized academic bodies and 48 teachers that shape. The information comes from statistics from official sources; from these data we try to characterize the groups and their members. The article contains some background PRODEP are some facts about the academic bodies in teacher training institutions, a brief characterization of Public Normal Schools in the State of Mexico, the study methodology, the results obtained, a brief overview and challenges future in the form of conclusions.

**Brief background of PRODEP**

In 1996 the Ministry of Education (ANUIES, 1996), in collaboration with the National Council of Science and Technology (CONACYT) and the National Association of Universities and Institutions of Higher Education (ANUIES) designed the program for Faculty Improvement (PROMEP Now PRODEP) to address the problems of higher education.

The program had positive points. An important aspect that stood out was that it represented a shift in focus on academics to move from policies focused on individuals focused on policies (De Vries and Alvarez, 1998, p. 184) academic bodies. PROMEP intended to raise the quality of higher education by strengthening full-time teachers (PTC) and its integration into academic bodies. According Zogaib (2000, p. 140), in the early years, the program had supported nearly three thousand teachers who meet the required profile.

PROMEP also had negative points. Guzman (2006) points out the false individualism which arose between the teachers and the little impact they had newly trained doctors in educational programs. The program, then, was to strengthen the profiles of PTC but was not contributing to raising the quality of education.

The program benefited greatly teachers by providing economic incentives. He became one of the three major programs dynamic epistemological processes of Mexican public universities, along with the National Research System and the Performance Incentives Program of Teachers (Lastra and Comas, 2014, p. 65).

But increased economic incentives also had its dark side. Before the peer evaluation system implemented by PROMEP key resource for the granting process, the risk of forming a scientific elite bureaucrats (concept of Alexander, quoted by Lastra and Kopewics, 2006) ran: bureaucratic meritocracy with academic leadership committees, practicing their own methods to science and away from the social sector. The program appeared to be beneficial but ran the risk of contamination.

Academic bodies in teacher training institutions. In 2008, public colleges were included in the rules of operation of the program to participate, from 2009, in granting economic incentives and recognition of academic bodies (Official Gazette, 2008).

Academic bodies are, according PRODEP (Official Journal of the Federation, 2014), groups of teachers or full-time teachers who share one or more lines of generation of knowledge, applied research and technological development and innovation in disciplinary or multidisciplinary topics and set of objectives and academic goals. The basic elements relate to all teachers who follow definite lines and share academic goals, all for the benefit of educational programs of the academic unit to which they belong. Also it conceived as a space for training: essential to the training of professionals and instrument of professionalism and updating teacher support. Academic bodies classified into three types: in training (CAEF) in consolidation (CAEC) and consolidated (CAC).

From a review of a number of concepts that characterize epistemic communities and collective knowledge producers, López (2010, p. 10) proposes a different definition for the academic bodies:

Small scientific community that produces and applies knowledge by developing of one or more lines of research and work in the same functions as the glue of the team. Add the concept of PRODEP expression scientific community, instead of group of teachers, which would presuppose a requirement difficult to cover.

Regardless of the definition, the establishment of academic bodies is not easy. There are conditions that favor or hinder integration. Mijangos and Manzo (2012, pp. 12-13) recovered some of the conditions that affect the strengthening and consolidation of academic bodies. From the study of three educational area consolidated academic bodies, but non-normal schools, identifies four key elements: the definition of a research broad enough to include all work and achieve, at a time of labor interdisciplinary way; the identification of important items, according to the regulations, to move towards consolidation; identifying strengths and weaknesses to achieve doctoral level rating; and the successful use of disciplinary diversity to better adapt to teamwork.

Lopez (2010, p. 17) recovers some elements that could strengthen the work of the academic bodies. According to the survey results, the most important factor (57.7%) refers to the production and application of knowledge. The second most important (29.5%) is related to a common agenda and shared interests. Between them they add just under ninety percent of the opinions. Also it refers (p. 21) certain elements that inhibit the development of academic bodies: the concentration of labor in some researchers and other overprotection (32%); hampering the development of individual members (27.6%); and distrust among members of the collegial group (25.8%).



Among the difficulties to strengthen collaborative work within the academic bodies, Dimas, Torres and Castillo (. 2012, p 200) emphasize: the need for better organization of work, lack of detail and clarity as to the requirements of each of the stages of development, insufficient recognition of the impact of these bodies in educational programs and, therefore, in the training of students and the need to strengthen further the teaching-research link.

Vera (2011, p. 82) points to the homogeneity in the training of teacher educators in both undergraduate and graduate, as a condition to facilitate the integration of academic bodies in regular schools. But also anticipates a voltage by the size of these institutions (p. 83): those academic bodies, management capacity and the amount of resources that could be incorporated into the institutions, could exceed the capacity of decision and power of directors or deputy directors.

Mendoza-Morales (2014) recall the case of normal school, where they have not been able to integrate academic bodies. He notes that the main problem is that educational research has not developed as an institutionalized practice then identifies the educational research as the prerequisite for full-time teachers could be integrated as groups that generate knowledge and apply it in innovative ways requirement. It also identifies a number of challenges for the normal school, in general, and his school, in particular, where you forget the root cause of the problem and merely states a series of platitudes relating to education policy and institutional organization that they have little to do with the educational research as the basis for analyzing and improving teacher training.

One of the trends that have been observed in normal academic bodies belonging to their schools are unlikely to consolidation. Yanez, Mungarro and Figueroa (2014) address the case of academic bodies of Sonora. Six who obtained their registration in 2009, five years later, two were missing and the other four kept its connotation of academic bodies in formation. The concrete experience of this entity indicates that the academic bodies in regular schools have little chance to consolidate, rather tend to remain at the elementary level of specificity or disappear. The main problem faced has to do with the limited academic production of collegiate groups, mostly reduced to conference presentations.

### **Public Normal Schools in the State of Mexico**

The State of Mexico has 36 public colleges, who are teachers for basic education: school and preschool, elementary. Administratively, the institutions are integrated into four geographic regions: north west, which includes five schools in the capital and four north of the entity; south west, which covers nine schools in the south and southwest of the state; east; which includes eight institutions from the east side of the border entity with the Federal District; and the northeast, bringing together ten schools of the metropolitan area of Mexico City.

Normal schools offer one to four educational programs, depending on demand in the region where enroll. The Ministry of Education is the entity that determines the programs must offer each and the number of applicants that make each generation.

Teachers working in them belong to the state education subsystem and can be of two types: full-time (PTC) and class hours. The PTC can have four types of appointments: teachers with more than 35 hours class, teachers "A", educational researchers and assistant.

The hours are class teachers who have an allocation of 35 hours or less. Principals do not have a teaching appointment, but a place of public servant. Then are teachers with four types of appointments who could, or should, do research and integrated into academic bodies.

### Methodology

The study is exploratory in nature. The intention is to characterize the academic bodies of the Public Normal Schools in the State of Mexico from a quantitative perspective, based on data collection from official sources of information. Some contributions qualitative in nature, grounded in our experience as faculty and as advisor to the standards with educational researchers PRODEP regular education group are also made.

The official information sources employed were twofold: catalogs recognized by PRODEP (Programme for Teacher Professional Development, 2015) and the databases of the Directorate General of Professions of the Ministry of Education (Directorate General of Professions academic bodies, 2015).

The sample academic bodies are the twelve Public Normal Schools Mexico State recognized by PRODEP, eleven training and one in consolidation, and 48 full-time teachers that form.

### Results

The revision of official information allowed us to describe the following characteristics of academic bodies and define the profiles of its members. Watch it separately.

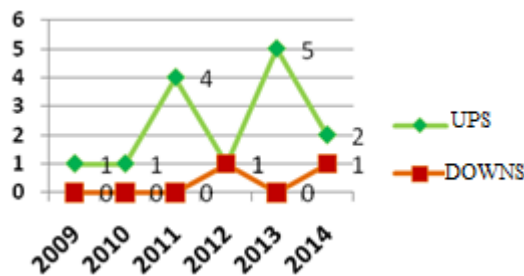
### The characteristics of academic bodies

Public Normal Schools in the State of Mexico have twelve recognized academic bodies by PRODEP, which would be 10.34% of all of this kind at the national level. The ratio is negative considering that the company is home to 13.84% of all teacher training institutions in the country. It is also considering the number of schools has recognized collegiate groups. Only eleven colleges (30.5%) have academic bodies, ten to one and one with two. In all other groups are full-time teachers who meet to work but have failed to establish a line of generation and innovative application of knowledge (LGAC) or have a scholarship established around the lines. Two more schools had a faculty, but lost after registration evaluation after three years.

The LGAC academic bodies have specific characteristics. Most of the bodies (75%) is only one line, the rest (25%), develops two. As the rules of program operation (DOF, 2015) suggest that develop lines with special emphasis on teacher training, ten bodies (83.3%) address lines in that sense, adapted to their school context: training and corporeality and training for physical education in schools that are licensed in Physical Education; reflection on practice, skills development, educational research in teacher training institutions for preschool education; skills development and assessment of learning in schools that prepare graduates in primary education and actors practice and processes, skills and track graduates in teacher training institutions of secondary education.

The formation of the academic bodies can also check from the seasonality of its recognition. The first recognized case of academic staff was recorded in 2009, but lost its connotation three years later. The 2010 recognition was granted one more, which remains in force.

In 2011 four bodies obtained recognition, one registration lost two renewed their status as collective training and the remainder was recognized as being consolidated. In 2012 only one faculty was recognized as such. 2013 was the most productive year for five bodies more received official recognition. In 2014 the figure dropped to only two (Figure 1).



Graphic 1 Ups and downs of academic bodies.

The number of members that make up the academic bodies is low (Table 1). Some of them (33.4%) only have the minimum number of members to be recognized as such, three. Most (41.7%) consists of four members. A minor proportion (16.6%) consists of five members and the rest (8.3%) is composed of six. Three out of four academic bodies are made up of the minimum number of members or the minimum number plus one.

The proportion of teachers with desirable profiles faculty is variable. Four bodies (33.4%) do not have any integral with appreciation desired profile, that is, one in three of that registration. Other four (33.4%) have more than half of its members with this recognition. Two (25%) have a single member with desirable profile. In one (8.3%) half of its members is recognized and the remaining

N.P.	Registration year	Membership	With desirable profile	Degree of consolidation
1	2010	5	3	CAEF
2	2011	5	4	CAEC
3	2011	3	2	CAEF
4	2011	4	2	CAEF
5	2012	4	0	CAEF
6	2013	3	3	CAEF
7	2013	3	1	CAEF
8	2013	3	1	CAEF
9	2013	4	0	CAEF
10	2013	6	1	CAEF
11	2014	4	1	CAEF
12	2014	4	0	CAEF

Table 1 Formation of the academic bodies

Profiles of full-time professors

Of the 48 full-time faculty comprising academics twelve bodies, most (64.6%) does not have the desirable profile recognition, only two in five (39.6%) have done. Of these, the majority (68.4%) has obtained a master's degree and only a few (31.6%) with PhD.

The professional training of members of the academic staff is heterogeneous, but keeps some similarities. Most have a master's degree (52.1%). It is followed, in quantity, those with a bachelor's degree (27.1%). The proportion is lower for those with doctoral degree: 16.7%. The remaining members (4.1%) did not find official information proving their professional preparation. One in two members of the academic staff has a master's degree, a significant proportion has only bachelor's degree and only one in six has a doctoral degree.

In the area of vocational training we observe some constants. The largest proportion of those with undergraduate is inserted into the area of education (30.7%). They are followed in number those who were enrolled undergraduate studies in primary education (15.4%) and secondary education, specializing in educational psychology (15.4%).

The same proportion (7.7%) are those who were trained to teach in the areas of preschool and secondary education with a major in English and who were enrolled careers not directly related to education: economics, chemistry and computer engineering. Most graduates were trained for teaching, only a small proportion (23.1%) came from other specialties.

Forming area	Academic degree		
	Bachelor's degree	Mastery	doctorate
Sciences		20%	37.5%
Science Educ.		48%	25%
preschool	7.7%	4%	
primary	15.4%		
English	7.7%		
pedagogy	30.7%	4%	
psychology	15.4%		
Administration		12%	
Social Sciences		4%	25%
Investigation		4%	12.5%
other	23.1%	4%	
Total	100%	100%	100%

**Table 2** Areas of PTC training

The teachers have a master's degree such training. Just under half of them attended programs in science education (48%). One in five (20%) accredited education program and a lower percentage (12%) he attended one over educational administration. The rest studied other programs: preschool, education, teaching and research, educational technology and social sciences, each with 4%. All teachers integrated in academic bodies coursed programs related to teaching, what a change is the area of expertise or the approach assumed.

Teachers with doctoral degree programs were enrolled in the area of education (37.5%), education sciences (25%), social sciences and humanities (25%) and educational research (12.5%). Most doctors were formed related to teaching and a significant proportion focused on research areas.

As for the institutions where, they were formed, we see an interesting phenomenon. Most teachers with bachelor studied in a public institution (84.6%). Only a small portion is formed in private institutions (15.4%). Of those from public schools, the majority (63.3%) attended a teacher training institution, both the entity itself as surrounding states. The rest (36.7%) was formed in universities, state or entities with which limited.

Academic degree	Percentage of total	Institution of origin	
		Public	Private
Bachelor's degree	27.1%	84.6%	15.4%
Mastery	52.1%	40%	60%
doctorate	16.7%	50%	50%
No Records	4.1%	-	-

**Table 3** Formation of PTC professional

Contrary to graduates, most with master teachers studied in private schools (60%). Only two out of five were formed in public institutions (40%). Almost everyone who studied in a public school, did a teacher training institution (90%) of the entity or the Federal District. Only a fraction (10%) graduated from a university, established abroad. Four out of five coming from private schools studied at universities (80%), especially in extramural facilities equipped in the state and in the nation's capital. The rest (20%) graduated from teacher training institutions, which have offices in several parts of the state.

With doctors we observe another phenomenon. Half of them (50%) studied in a public school and the other half (50%) in a private school. Half of those studied in a public school (50%) did so in a teacher training institution, the other half (50%) he graduated from college, all established in the state. Those who were trained in private schools, studied at teacher training institutions (75%) and universities (25%), based in the entity or its parent from other states.

According to these data, the majority of graduates were trained in public institutions, most of the teachers come from private institutions and half of the doctors studied in public institutions. It seems that those with a master's degree education programs have chosen to obtain the degree which is flexible and does not necessarily require the development of a thesis. In half of those with a doctoral degree this same trend. In the other half, from a public school, we observed a singular fact: all have a university degree, all working in normal schools established in the capital of the entity and all have the desirable recognition profile of PRODEP.

### **Balance**

Based on the statistical revision made, we can venture the following statements. Few ordinary public schools in the State of Mexico that have academic bodies, two out of three institutions still fail to put together a group of teachers to produce and apply knowledge collaboratively. Registered academic bodies are in the process of formation, except one, which is in the process of consolidation. The years in which the largest number of academic bodies reported these institutions were 2011 and 2013.

Academic bodies follow a line only generation and innovative application of knowledge, but three of them cultivate both. In all cases, the LGAC following are directly linked to teacher training. One in three bodies does not include teachers with appreciation desirable profile and only the body that is in the process of consolidation has four with that distinction.

Most teachers integrated in academic bodies lack the desirable profile recognition. Only two out of five have obtained and of these most have been master's degree.

Doctors with desirable profile are the leaders of their respective bodies, except when more than one matches in a collegial group.

The prevailing degree among members of academic bodies is the master, but the number of teachers with bachelor's degree exceeds that of those with a doctoral degree in an area close to two to one ratio.

The courses taken by teachers who are graduates, teachers or doctors are related to education and science education. As there is diversity in the institution that trained them graduates come from teacher training institutions of public support; teachers graduated from teacher training institutions of private; and doctors studied both in public and private schools and come from teacher training institutions and universities. Doctors who come from public schools have initial university training, have the desired profile and are attached in institutions of the state capital.

### **Conclusions**

Public Normal Schools in the State of Mexico faces a series of challenges to be overcome in the near future. Institutions that do not possess any faculty should create conditions for strengthening research collaboratively and achieve the formation of one or more conditions. Schools that have them, will enhance the processes for registration of a greater number of bodies and consolidation of existing ones.

Existing academic bodies must consider the option of integrating more teachers, since some work with the minimum number of members, leading to a permanent risk of disintegration. The members of academic bodies are to increase production and raise academic levels enable to achieve recognition of desirable profile and increase the chances of consolidation.

The recognition will be desirable profile with a doctoral degree and not only with the master.

Members should ensure the empowerment of institutions of public higher education, having academic recognition and focus their research programs to improve the training process and acquire experience in developing thesis.

Some Public Normal Schools in the State of Mexico are in the process of conversion to institutions of higher education have meant that their teachers are integrated in academic bodies and achieve the desired profile recognition, missing assess whether these efforts positively impact the collegiate groups training of future teachers of basic education.

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## Human capital management for sustainable agribusiness from the perspective of the securities

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### Abstract

One element that has a greater impact on the strategic plan of an organization's human is the capital so their management becomes crucial for organizations. In this research the human capital management sustainability-oriented agribusiness (; SAGARPA, 2012 ILO, FAO, IUF, 2007) is addressed. It is based on the Estrada Monroy and Ramirez (2005) authors; Garcia (2008); Pirson and Lawrence (2009) Research takes the importance of values and their implications to work (Shalom, 1999) and sustainability (UNESCO, 2014; Florea, Cheung and Herndon, 2012) and organizational culture Schein (1996 2004) and the process of change (Cameron, KS and Quinn, RE, 2006). The methodology used is qualitative using case study and main findings, we mention that the management of human capital from the time of joining the company, ensures the consistency of objectives and values with organizational, impacting on the sustainability of agribusiness.

### Human capital, sustainability, agribusiness.

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**Introduction**

Small and medium businesses show sustained serious difficulties in the market due to constant changes in the environment in which they operate; therefore it becomes essential to seek and implement strategies to not only survive, but to obtain yields that facilitate them to continue their normal operations. One resource that has the greatest impact on the business plans of the companies is human capital, so it is necessary to properly manage it.

In the agribusiness labor faces a series of adverse working conditions: they require a great physical effort, usually live below the poverty line, away from the workplace, are employed individually or the whole family, in unsanitary conditions, and environmental and safety are the least likely to access effective forms of security and social protection (ILO, FAO, IUF, 2007).

Resolve the current situation of this sector regarding human capital implies profound changes in thinking (Estrada Monroy and Ramirez, 2005), it must return to the basics, it is necessary to question the understanding of how we see ourselves as human beings and how we build that understanding based organizations (Pirson and Lawrence, 2009). In this sense the change of organizational culture is the key to successful implementation of the main strategies for improvement (Cameron, KS and Quinn, 2006, p. 11 and 12), for without an alternation of individual or organizational basis The change will remain superficial and short-lived (Quinn, 1996 quoted in Cameron, KS and Quinn, 2006, p. 11 and 12). To properly manage human capital, it strengthens what is a competitive advantage and fosters improved organizational climate (ADEC, 2009).

**Values and organizational culture**

A more humane organizational culture that is founded on values that appeal to the humanity of the employees, it is more valuable in the long run than one that is based on values such as competitiveness or contingent innovation, not because they are unimportant, but because away of the natural aspirations of man, these strategies of competitiveness and innovation and participation are relevant, whether they are connected with their aspirations and values (Alvarado and Monroy, 2013).

The values have been associated with the club, when personal and organizational values are not aligned, higher levels of dissatisfaction and stress (Posner, 2012) are given place, it is then that the alignment between the values related to the welfare influences health in human capital, contributing to the Corporate Social Sustainability, being one of its health indicators (Dyllick and Hockerts, 2002; Baumgartner and Ebner, 2010).

Organizational culture plays a role in achieving motivation, since the difference or discrepancy between one of the personal and organizational values suppress motivation (Posner, 2012), motivation is one of the internal indicators of Corporate Social Sustainability (Dyllick and Hockerts, 2002; Baumgartner and Ebner, 2010), to achieve not just treat employees rewarding way, which in the short term is effective, but in the long run is insufficient, so the values are taken as lasting factors (Florea, Cheung and Herndon, 2012) serving time at the beginning of Sustainability (Brundtland, 1987 cited in Florea et al. 2012). The International Labour Organisation (2014) mentions that the promotion of dialogue and collective bargaining are drivers of productivity and good business practices contribute to have a place of sustainable and responsible work.

Socially Sustainable company seeks increased employee loyalty and business partners (Dyllick and Hockerts, 2002), culture and beliefs are implicit shared meanings, which reinforce the commitment (Hofstede, 1997 Alvarado said Monroy, 2013 ), values such as responsibility and solidarity promote ownership and streamline the organizational culture deploying affective attitudes that reinforce the unity, cooperation, friendship, commitment and respect (Alvarado and Monroy, 2013) and matching values, create identity among workers and so the organization can be the basis for greater commitment. (Ashforth and Mael, 1989 cited in Alvarado and Monroy, 2013) contributing to employee loyalty.

A separation between the social and the economic is strategically untenable (Nicholls, 2006, p.24 quoted in Pirson and Lawrence, 2009), the universal ambition of humanism multiple targets supposed to be integrated and harmonized as stated Pirson and Lawrence (2009 ) values are closely related to employee behavior and that underlie and guide many personal behavior and work (Florea, Cheung and Herndon, 2012) and its alignment with the organizational culture leads to positive work attitudes and organizational results (Posner, 2012), since the behavior of employees have financial consequences for the performance, productivity and even the workers themselves (Casio, 2006).

### Methodology

The case study method that Wacheux (1996) is a spatial and temporal analysis of a complex phenomenon by conditions, events, actors and implications was used for this investigation. The case study can describe reality so it was considered important to analyze agribusiness in the municipality of Guasave, Sinaloa, how human capital is managed, from the perspective of values and their influence on sustainability.

For this was used as an instrument unstructured interview the board of directors, head and middle managers. Additionally, it was supplemented with documentary information collected and no participant observation notes.

### Results

The studied company is constituted as a society of rural production oriented to the domestic market and export to the United States; dedicated to the production of potatoes, corn, beans and tomatillo, mainly; according to the stratification of enterprises of the Ministry of Economy it ranks as medium enterprises, has a senior at fifty years in the market in which it has evolved a moral person physical person.

The manager has a bachelor's degree like all middle managers; the company has a lean organizational structure and has no temporary workers despite the seasonality of production, so it is the same staff that provides services in Sinaloa, Sonora and Baja California, which are states in which planting. It promotes the quality of life of employees, families, investors and suppliers, combat corruption practices and fosters respect for human rights; so for this and other actions has been recognized for two years as a socially responsible company Distinctive (ESR) in Mexico is awarded by the Mexican Center for Philanthropy (CEMEFI).

In their view points to be a company formed with people of integrity and experience and professional development mission opportunities for the team of collaborators. The number one informant says that initially is more common sense used today but well-trained and skilled in the use of technology professionals combine knowledge. Human capital is for the company a competitive advantage in the training courses offered by providers on best practices, environmental protection.

Use of products, demonstration plots prey; no use of child labor is done, pregnant women do not work in the field.

The informant says that the number two technical staff is trained to handle chemicals, processes tending to not pollute the environment, is produced and used for organic fertilizing soil conservation, compost is produced, water use is optimized by New mechanized means of irrigation systems and focus on the production of healthy food. The leaders do not skimp on investing to train staff so that they have a high degree of specialization.

It seeks to raise the level of worker satisfaction making them participants in each of the decisions made to strengthen the organization; looking from the time of hire, the business objectives are aligned with personal and there is coincidence with the values and organizational culture. Human resources department whose main objective is to hire the right people according to the analysis of the place of origin, values, habits, motivations, personal goals, knowledge of their family life project, professional profile, skills, attitudes, competencies are created, among others.

It has a training program in which even involved the members of the board, who point out the need to return to the classrooms, updating, investing in cutting-edge knowledge and that cannot be left behind and stress the importance of leading by the example.

All behaviors of staff must be aligned with the Code of Ethics and Code of Conduct; respect, honesty, teamwork, communication, continuous improvement and commitment to the community for social, economic and environmental improvement in the region where the values are highlighted.

The code of ethics includes anti-corruption practices and is signed not only by employees but by suppliers and customers in order to strengthen the value chain. The company promotes shared by the organization and its employees through dynamic communication flow values.

In the future are displayed as a company committed to its stakeholders, focusing his market in older people, providing practical products, the company run by people who do not necessarily belong to the family but must share its values, objectives and goals; all well aware of the changing environment and anticipating, as far as possible on the impact they may have on the company, without fear of competitiveness and as a world-class company independent of location.

### **Conclusions**

After analyzing the information gathered through documents, interviews, observation can rescue as major contributions of this work to the study of corporate sustainability are, first, an approach to the reality of agribusiness in the region Guasave, Sinaloa. Which shows that proper management of human capital is constituted as a competitive advantage (ADEC, 2009); and improves the welfare of employees.

Second, values-centered management contributing to social sustainability by increasing motivation, health and loyalty of employees to the extent that personal and organizational values are aligned and whose focus on values, contributing to the creation financial value of the company; have a flow chart which not only authority but also the values shared by the company and its employees.

The main limitation of this research is the difficulty of generalizing the results by the fact that a case study; however, it gives us insight into the particular phenomenon which provides important information about how human capital is managed.

Another contribution is that, contrary to the characteristics of agribusiness indicated by different authors in relation to little or no academic training of administrators, it was found that both the ruling and middle managers have undergraduate or related standard.

From the findings and contributions of the work we can conclude that the human capital management contributes to improving the sustainability of the companies in the agricultural industry but also impacts productivity, improving organizational climate, the commitment not only by employees but by all stakeholders (suppliers, customers, community, and shareholders), the permeability of shared values and job satisfaction.

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**Professionalism and financial developments in manufacturing SMEs**

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**Abstract**

In family SMEs the management positions are traditionally occupied by the children as likely successors, with the intention to prepare them for their functions and create awareness of the responsibilities and commitment that represents, however, in several occasions there are not considered the aspirations or capabilities of the family members that not necessarily converge with the goals of the business. The case under study is an uncommon example of the decisions made by a leader who faces the dilemma of professionalizing the management positions with staff outside the family due to the lack of identification from the family members with the goals of the business, or allow that their financial position could be discredited at the point of jeopardize their existence.

**Financial position, strategic management and professionalization.**

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**Introduction**

The Mexican government, through the Official Gazette of June 30, 2009 indicates that MSMEs are "fundamental to the economic development of member countries, thus contributing to employment and its contribution to Gross Domestic Product ". According to information obtained from the Economic Census 2014 prepared by the National Institute of Statistics and Geography (INEGI, 2015), in Mexico there are 5'654,014 of economic units, and according to its method of tour 99.8% are Small and Medium Enterprises (MSMEs), which create 74% of jobs and generated 35.9% of total Gross Domestic Product (INEGI, 2015). The constant challenge is to establish mechanisms of survival for these organizations to develop remain in time.

**Theoretical reference**

According to literature, to decide who manages an SME and the time begins its management is one of the widespread problems in these organizations, usually the decision was initially leaning towards a relative of the leader or founding partner, however factors the degree of commitment, performance and adherence to corporate culture can cause the final decision rests with an unfamiliar professional manager.

**Professionalism in SMEs**

Olazarán, Albizu, Lavia and Otero (2013) assessed the relationship between vocational training, SMEs and innovation in industrial entities and thus be able to identify the role of the first to the positioning of the companies in the market. The results show that despite the notable inclusion of professionals and technicians in the operation of these organizations is emerging recognition of the role that they occupied by companies, originated from insufficient connection with innovation systems.

In a comparative study of the financial and administrative profile in SMEs in Mexico, developed by the SME-CUMex Red (2010), it was determined that more than a third of employers in the study population (State of Mexico, Hidalgo, Puebla, Sonora and Tamaulipas), rarely or never perform human resource practices such as recruitment and selection, promotion, wage and salary programs, incentive plans, programs and safety and risk prevention, which is reflected in a lack of suitable staff selection methods to motivation and development.

Zapata (2004), made an analysis-diagnosis of the difficulties Colombian SMEs considering internal and external influences in nine cases developing a comprehensive systemic diagnosis, included among its strategic areas of strategic orientation, knowledge management, logistics, marketing, environmental , communication, financial and human resource management; in this regard noted that the activities of human resources are made informally with recruitment by recommendation, you do not have profiles of the charges, it does not take into account the training and the training is done quickly and career development does not obey a performance evaluation.

Shu-hui and Shing-yang (2007) developed a study where they question who should lead a family business, does a family member? Or a professional manager? And the impact of this decision on the performance of the organization. They try to identify companies and their characteristics that must have when the administrator belongs to the family or on the contrary, those whose features suggest a better result with the guidance of a professional manager, ie a foreign executive to family.

To do analyze the performance of both types of executives and the results show that firms with low requirements in management skills and high potential for expropriation tend to select as CEO a member of the family that is also known as nepotism they give prominence to blood ties and not to the ability of the manager. On the contrary, when the family business has a poor control and requires cash flows tend to select a CEO that allows them address these needs primarily evaluating their experience, culture and capacity.

Shu-hui and Shing-yang (2007) applied an empirical method that includes variables such as the degree of risk and development, firm size, expandability, cash flow and ownership structure. The study was conducted with a sample of Thai companies and shows that they prefer mostly hiring a professional CEO and turn the analysis of professional and personal characteristics that should have it done by a professional agency to conduct the Initial election, this situation arises when the same companies recognized to have a high need for efficient administration and require improve the overall performance of it not risking their cash flow requirements experimenting with CEO's family.

Royer, Simons, Boyd and Rafferty (2008) conducted research in support aspects pointing literature as to why choose as a successor to a family, not a professional manager in family SMEs. The study was developed over 860 Australian companies, allowing them to determine which specific knowledge of features combined with a favorable atmosphere transition, in certain contexts, make a family member the ideal choice, although several studies indicate that nepotism is generating conflicts in organizations, especially when other participants within the firm are interested in leading your future but unfamiliar.

Royer et. al (2008), focused their study on whether the election as successor of a family is more successful in an industry that in another, as seems to occur in the construction industry and the craft sector.

The study was based on the theory of transaction costs which assesses the likely costs of transferring knowledge signature to outside directors; and finding them to be as low as possible; as this transfer has to publicize internal family values (honesty, mutual support) and different types of knowledge directly related to the business activity (operational, administrative and current technology as well as planned and strategic planning); This transfer must occur within a communication process established and tested within the organization to avoid deviations in the same given to you at the chosen successor. Maybe the transfer of administrative control and family values is not seen as something complex, but just imagine those cases you have to give to know and trust to an unfamiliar successor information and protects patent It is the axis on which turns the family economy. Also you have to imagine how to explain or establish communication with a non-blood successor when to transmit the ethical values of predecessor and family together to be seen and even encouraged by him; this stage is known as idiosyncratic knowledge and usually has family members at management level.

Roger, et al. (2008), designs a contingency model for succession in family businesses, and to identify whether the likely successor is familiar or not; it has general knowledge of business management and technological aspects of the industry, posing for it the following scheme:



General knowledge of the specific industry of domestic successor of the family (CGIE1) more specific technological knowledge industry internal successor (CTEI1) more knowledge and specific experience in the family business of a successor outside the family (CEEE1) It must be equal to or greater than the general knowledge of the specific industry unfamiliar successor (CGIE0) more specific technological knowledge industry unfamiliar successor (CTEI0), which can be expressed as follows:  $(CGIE1) + (CTEI1) + (CEEE1) \geq (CGIE0) + (CTEI0)$ .

Overall compliance with the amounts as proposed in the formula leads us to conclude that if the domestic successor gathers all the elements required, then, may be who directs the company; otherwise you should opt for an external professional manager to the family.

### Leadership in SMEs

Velázquez (2005) proposes an empathic style of leadership as an alternative to the Mexican organizations in the design of their schemes of work and organizational structures around work teams through a leader, achieving high performance aiming at the full integration of human capital and optimal utilization of material and financial resources.

As Mendez (2007) notes the management in SMEs can be considered easy because their organizational structure is simple to focus in leading decision-making. Mannucci (2007) states that the design and use of new tools that allow them to manage their resources, strengthen their relationships and their products in a dynamic and complex context, therefore the leader faces uncertainty when conditions intended design is necessary for these organizations strategies for the future of organizations.

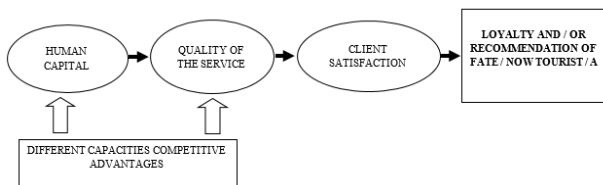
### Competitiveness in SMEs

Many of the elements defining the concept of competitiveness for some years have begun to be overtaken by a reality that today is characterized by a highly demanding and dynamic market. The globalization of markets, the emphasis on technology, quality products and service to customers make up some of the main guidelines that companies must address as a priority if they want to be left behind compared to its competitors. In the case of Mexico, as well as most Latin American countries, it is important to consider the role that SMEs have played as drivers of economic and social development. In a survey conducted in 1991 by the Mexican Institute of Small and Medium Enterprises, Mexican entrepreneurs identified the following as the main problems of SMEs (Bensusan, 1996): a) lack of stimulation and excessive tax burden, b) absence adequate and timely financing, c) price controls, d) shortage of technically trained for all levels work, e) bureaucratism, f) inconsistent government support programs and lack of credibility in them, g) excessive government inspection h) duplication of government agencies related to SMEs. In addition to this list, drawn up by employers, many scholars agree that the informality and paternalism are also two conditions that have recently benefited SMEs in Mexico.

The need for competitive SMEs is a local concern but has been detected in different countries and excludes sectors such as tourism as noted by Rodriguez and Stew (2002), in the study of competitiveness and strategic analysis of tourism in Galicia, Spain aware that tourism is capable of stimulating the economy, which is reflected in its contribution to GDP, although not all tourist areas exploit their full potential, therefore they suggest the need to redefine strategies collective to maximize their comparative advantages and to turn them into competitive advantages.

Having as main objective the sustainability of the activity over time.

Meanwhile, Lillo, Ramon and Seville (2007), analyzed the human capital as a strategic factor, which they consider key in a new international context to bring intangible but differentiating values that become competitive advantages. These authors state that the personnel working in SMEs must have derived from education policies that raise the quality of human resource training services with which it is told, and no one would like to have, Figure 1.



**Figure 1** Human Capital and Competitive Advantage.

For the services sector, the human factor is inextricably linked to the process, becoming a link in the value chain, and the customer perception of the quality level achieved compared to the initial expectation (Lillo, Ramon and Sevilla, 2007).

### Profitability in SMEs

These organizations face problems affecting profitability regardless of geographic location and hence its stability in the long term as stated Rivera (2007), in the study developed to assess factors affecting the capital structure of SMEs in the garment sector of Valle de Cauca (Colombia) using the economic and financial analysis, finding that a high or low level of indebtedness and its cost are decisive factors for the selection of financing which affects the cost of capital.

In Venezuela Restrepo and Vanegas (2009) analyzed the financial profile of SMEs through an empirical approach which concluded that the return on assets (ROA) acquired through financing, often negative because remain idle in Mexico Navarrete and Sansores (2010 ) analyze the profitability based on the Theory of Hierarchies and an econometric model applied in a sample of 317 SMEs established in Quintana Roo, Mexico, and the results suggest that the age of the company and its size determines the financing policy which It reflected in the structure of capital.

### Current situation of external financing for SMEs

According to Vargas (2003), most SMEs lack the necessary management to become innovative, self-sustaining and growing units, being part of this problem the difficulty they face in obtaining financing that favors the development of strategies and generation resource. Casasola and Cardone (2009) note that in the case of Spain, opacity in the management and the high concentration of risk are two of the main problems that traditionally have faced these organizations in obtaining financing, whose lack in often prevents them achieve significant growth and restructuring cases of financial insolvency costs for the refinancing option also affect the capital structure as studied Aybar, Casino and López (2006) in the case of Spanish SMEs crisis.

Most MSMEs do not opt for financing from commercial banks, (Echavarría, Varela and Morales, 2007) coupled with the limited availability of credit, which warrants a question: what are the sources of financing of MSMEs are? Although financing alternatives are not most of the time an option for businesses in Mexico (excluding credit from suppliers), the main sources are:

a) The supplier credit, b) credit cards department stores, c) the sale or rental of obsolete or non-strategic assets, d) Asset leasing manufacturer e) sponsorship, subsidies and support providers.

### Research methodology

According to Yin (2003), the case study is an empirical investigation of a contemporary phenomenon in its real context, where the boundaries between the phenomenon and context are not displayed accurately, and in which multiple sources of evidence are employed. The case method seeks not only to identify the factors that affect a phenomenon, but detailed knowledge of these factors in the analysis units (Marcelino, Baldazo and Valdes, 2012).

### Methodological design

According to the classifications proposed by Yin (2003), the methodological design used for the analysis of this case is illustrative type, it presents or exemplifies the phenomenon under investigation under a particular theoretical approach.

Professionalization of senior management and financial developments, which are described through the problems that arise in the company where they carried out the intervention, which is analyzed under different theoretical approaches were considered as the main units of analysis presented for these constructs.

The case design is nested, it is constituted by a single phenomenon with more than one analysis unit (Yin, 2003).

### Development of the case

#### Company Background

Biosynthesis S.A. CV is constituted in August 1998 as part of a group of companies with family background, focused on product development manufacturing value-added of the primary sector. Administrator knowledge of the company and head of the business group (Raul), develops an interest in forestry and agricultural products (dyewoods) for production of dyes for the leather and textile industry, this led him to conclude a strategic partnership the National Polytechnic Institute resulting in the creation of a jointly research center biotic products aimed at developing new products from species endemic to the region. This work began in late 1978 two projects were generated: a) natural dyes own wood from the region (wood and wood red mulberry) and b) extraction of concentrates from the aloe vera plant known in the region as aloe.

The process began in the state of Yucatan able to generate a range of aloe vera products in liquid forms and powder for the food industry and cosmetics. The goal initially was the American market and the products are marketed through a representation of the same company located in Miami Florida, however, this decision generated some internal problems in the company that was not allowed to grow financially:

a) Lack of market and dependence on a single client that was part of the same group, which did not allow for sensitivity to the needs and expectations of it.

b) Lack of liquidity, since the shape distribution generated a very low profit margin.

c) Both management and the sales were in charge of the administrator who because of their multiple roles within the group not established a comprehensive plan and business strategy.

d) Not had an adequate costing system that would allow timely meet the costs of production and margins (a situation that was repeated in the pricing of retail dealer and actual market prices).

From the transfer of businesses to the city of Campeche in 1998, we tried to change the way you manage the business, then the children of the household were already adults. The first intention in this change was to allow the eldest (Angelica), which lay in Campeche, administer the business, and see the distributor jointly with the second daughter living in Miami (Georgina). However this change, how to manage and especially the decision followed within the same dynamic, always being centralized in the founding partner.

By 2000 after participating in an international fair in the natural products industry, the interest was in the market to focus on food products more natural value (biotic products) was observed, generating a new product concept: 1) Liquids aloe vera concentrated base products for the food and cosmetic industries, 2) concentrated aloe vera powder as a base for cosmetic products and medical industry, and 3) nutraceutical drink with concentrated flavors of aloe vera active end product for consumption, (a nutraceutical compound can be defined as a dietary supplement, a concentrated bioactive natural substance, usually present in foods and that, taken in excess of the dose existing in those foods has a favorable effect on health, greater than You could have normal food).

Therefore, the alliance with the National Polytechnic Institute and through the support obtained through a project submitted to CONACYT jointly with biotic development center IPN resumed, resources were obtained to develop the process of developing the new line of beverages. The result of this research was drinks for final consumption of concentrated aloe vera natural flavorings: a) jamaica, b) pear, c) handle, d) maracuyá e) natural.

During this time, Biosynthesis followed in the manufacture of its original products, starting to gain market share and sales levels, liquidity and financial aspects began to change amount so before the administrator's decision.

"... .. In the expectation of demand for the new product it will be impossible that the current form of distribution to cover all needs, so the distribution of liquid concentrates and powder to remove US to concentrate all efforts on the distribution drinks.... "Raul.

The above decision was positive from the point of view sales and market knowledge as Biosynthesis went from two customers in 2000 to over 25 by 2003. However, the method of administration remained unilateral and Angelica showed little commitment the company (and by then decided to create his own trading and vehicle leasing company), this was reflected in erratic financial results.

### **Innovative processes**

All tests proved positive on a pilot basis and product interest in foreign markets seemed to be growing prompting the CFO to make a decision in 2003 that eventually generate a radical change in the company.

"... .. We have it could not find an appropriate way to maquillage a new product - commented one day - so it is important that Biosynthesis have its own production and bottling line ..." Raul.

After several unsuccessful attempts at commercial banks in late 2004 BANRURAL support was achieved by means of a credit of \$ 2 million for the purchase and installation of a bottling line first level conjuntándose with the company BEPENSA transfer by way of loan from a blower PED equipment for the production of the bottle in the plant and minimize costs. Credit conditions gave a period of two years to start amortized and interest payments; however the automation of processes must increase production and reduce costs thereof.

For 2006 we have a critical situation and that factors not considered initially gave the administration:

a) Family and personal

1. Angelica decided definitively gets away from the company, 2. Georgina decides to come and live in Campeche after many years, closing the representation in the US and 3. An important disease financial manager (Raul), it moves away a long time of it.

b) Market and Finance

1. Although the project had facilities and processes, visualized now that was not the same sell concentrates focused to a very specific sector customers; to drinks that are consumer and require a major network marketing and logistics and distribution, 2. The project was delayed in the payment periods and credit he was restructured twice while BANRURAL disappeared and Rural, which was the new financial institution, could qualify the portfolio risk and 3.

Although the traditional concentrated range of products had grown significantly, it was insufficient cash flow generated to cover all the needs of the new line product, the net losses of the company were important, as is reflected in the indicators in Table 1:

Year	Accounts receivable turnover	Inventory turnover	Liabilities Capital	liquid reason	Return on investment	Return on equity	utility
2006	69.5 days	482 days	2.58	2.19	- 6%	-42.3%	- 4,805

**Table 1** Financial ratios at the end of 2006.

As the recovery period can be seen accounts receivable is greater than two months and inventories are low turnover; asset investment and capital is not profitable and incurred significant net losses.

In 2007, before the complexity of the financial situation, options to move forward with the project, which was in danger of falling into arrears before a maturing, are sought:

"It is overwhelming ..... this situation, raised the administrator, I do not see the interest of my daughters by the company, I am sick and elderly, will not allow the company disappears, I prefer to sell or lease part of it, not I considered the aspect of marketing the product .... "Raul.

In mid-2007, after attending a trade fair of the food industry in the United States, Raul met the CEO of Chato Group, a leading Mexican company in the sale of Mexican products with demand in the United States and leading brands placing the north, also had the license for production and distribution of leading brands of drinks and especially an important distribution network throughout the United States.

After Chato Group undertake valuation work, outer self-interest to bid for the 51% stake in Biosynthesis under the following conditions:

a) The resources obtained with the purchase of capital would apply to the full settlement of the debt with Rural by the bottling line.

b) The bottling line would move to the city of Mexicali, to use its full capacity in the production of the drink (new for them because their knowledge was on soft drinks) and traditional products (Jarritos and stately Sangria)

c) Administration of Biosynthesis is completely Chato who included Biosynthesis Group as a subsidiary sending a new general manager.

d) Pressure founding partner is designated as sales director Georgina (living in the United States, had greater knowledge of the company and showed interest therein)

e) The founder and head of the family, socio remained as honorary president of the board of Biosynthesis without voting rights.

### Analysis of the particular problems

In this case an unusual dilemma occurs in family SMEs, since the founding partner must decide before the process of succession, which was leaving the administration of the company, given the lack of interest and commitment to be presented the children and the pressure of the financial situation. According to Shu-hui and Shing-yang (2007), the decision of the administrator is a result of the attitude observed by his successors in the future, reacting to the poor control of production costs and effective low flows. The strategic alliance concluded between Biosynthesis and Chato Group resulted in the implementation and innovation of various processes such as: 1.

The practice of formulating budgets for the entire company and learning from all staff, 2. Establishment of operational goals and financial, 3. Preparation of financial reports and monthly reports to the board meeting, 4. Registration of all areas and constant supervision, 5. Rethinking processes costs, 6. International certifications to be in a position attract new customers, 7. It does have a complete organizational chart, with job profiles and set of objectives for staff, 8. a series of indicators for each department that are useful for measuring performance is generated, 9. programs begin weekly meetings at all levels to disseminate information and also identify problems and 10. It generates between staff continuous improvement teams.

In late 2007, and once materialized alliance, Group Chato decides that the draft beverages will be absorbed by corporate within their structure of drinks as the experience gained leads to that is better than Biosynthesis will focus only the development and consolidation and concentrates on the development of new projects; (Special needs of some clients of specific concentrations of active aloe, and a new process to take advantage of the stalk of aloe so far considered as regular waste), the above coincides with that indicated by Castellanos (2003) and Mannucci (2007), noting that both the management and the organization in innovative SMEs to transcend formalized, with no significant influence of the leader confused with interference processes.

As a result of the professionalization of administrative and operational structure of the company it managed to evolve positively in the period 2007-2011, as shown in Table 2:

Year	Accounts receivable turnover	Inventory turnover	Capital Liabilities	liquid reason	Return on investment	Performance Capital	utility
2007	37.6 days	422 days	0.71	1.06	- 4.5%	8.59%	- 3,612
2008	39 days	286 days	1.61	9.22	6.2%	10.5%	- 2,253
2009	26 days	158 days	1.80	10.96	10.3%	15.82%	1,041
2010	58 days	167 days	1.7	12.91	17.8%	15.36%	2,201
2011	35 days	106 days	0.18	9.27	20.3%	19.52%	2,159

**Table 2** Financial ratios for the years 2007-2011.

By 2012, after a period of recovery, a number of factors both the regional and international context were presented, as well as internal aspects that made the financial results fell drastically and forced the administration to establish a rethinking of business plan, as suggested Kokocinska and Rekowki (2013):

1. A significant drop in the market before the financial crisis occurred in Europe
2. Extreme drought in the region and stop producing plantations (in this regard the weakness of not having carried out a development plan providers identified)
3. Internal costs rise (amid falling sales and lack of supplies is decided, however, retain the staffing in order not to lose the knowledge and experience thereof). The financial results are shown in Table 3:

Year	Accounts receivable turnover	Inventory turnover	Capital Liabilities	liquid reason	Return on investment	Capital Performance	Utility
2012	43 days	285 days	0.19	7.30	- 17%	-16.3%	- 2,725

**Table 3** Financial ratios at the end of 2012.

In developing plans for 2013, a major weakness in the sales structure (until Georgina continued to face far as sales director), also has the strength to go on promotional events abroad is detected and at the same time, as did Angelica also begins a new personal business what limits your attention and market research, this is in contrast to the findings by Royer et. al (2008), who believe that senior management in a family organization should rest with the family, because they will have a greater responsibility to safeguard family and corporate culture, which does not occur in the case analyzed.

Against this background, it was decided with the consent of the honorary president (founder of Biosynthesis partner) Georgina liquidate. CHATO Group hires an external recruitment office to locate the new sales manager who once hired participated in the formulation of the 2013 budget, the plan includes: 1. professionalize the sales department, 2. investing in trademark, 3. Consolidate certifications and 4. Greater participation in international promotional events

The decisions taken jointly by the honorary chairman and the management body of Biosynthesis agree with the proposal of Velázquez (2005) on the need for an empathic leadership with strategic vision to achieve the interrelationship between the areas that make up the company and dynamic management. As a result of the new proposed work plan aimed at recovering an equilibrium level for the year 2013 and over the next three years again reach the levels they had in 2011, see Table 4:

Year	Accounts receivable turnover	Inventory turnover	Capital Liabilities	Liquid reason	Return on investment	Capital Performance	Utility
2013	39 days	174 days	0.16	7.80	0.6%	1.84%	62
2014	31 days	135 days	0.17	9.53	9.9%	12.34%	902
2015**	31 days	81 days	0.17	5.32	11.31%	20.57%	3,442

**Table 4** Financial ratios at the end of 2013, 2014 and part 2015.

**Conclusions**

The analyzed case presents how a company with family background evolves positively, based on a series of decisions led by founder and reflected in the following aspects:

**Professionalism:** The leader of the organization recognizes the inability of children to achieve generational continuity and decides to professionalize the areas of control of the company with managers who do not emanate from the family, but have a better preparation and management commitment to achieving d business objectives.

Genre: Initially management positions are assigned to the daughters adapting functions to your personal needs, however, occupations and aspirations they do not reflect sufficient level of identity, belonging and commitment to the company, which threatens the future Of the same.

Strategic alliances: The SMEs studied accurately reflects the competitive advantages of proper decision-making with a more entrepreneurial than emotional vision and prompting the leader of the organization initially partner with a research center to develop new products and posteriorly a business alliance by the partial sale of its shareholding, to clean up the financial position of the company and improve the logistics operation which is ultimately reflected in an increased presence in new markets.

Financial situation: The study of financial indicators covering a period of 8 years from 2007 to 2014 and a partial analysis of 2015. In this period it is possible to observe how the managerial performance affects the financial position of the company and conversely how Leader major decisions are reflected in a positive development, where he agrees to give up some control of the company, to channel resources to pay liabilities and even the replacement of one of his daughters in the management position he occupied.

The decisions made substantially improved the ability of the company in reducing the time to recover accounts receivable and give greater inventory rotation, minimizing shrinkage and obsolescence. In terms of liquidity it was positively and increases the return on investment in assets and invested capital which eventually allowed a substantial increase in profits generated by the conclusion of strategic alliances.

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## Habitat improvement in Chipilo of Francisco Javier Mina. Puebla: Use of biogas as an alternative energy in the productive activity of dairy cattle animal house

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### Abstract

The proposal is part of the project results funded by PRODEP "Family Treatment Plant as Stable energy attachment Bio digester". Rural housing in Mexico is still a production unit, where productive activities are development, the main livestock and agriculture. There are areas with a clear dairy vocation also complement this productive activity with the cultivation of fodder to produce their own food, in the state of Puebla traditionally a farming community of milk and dairy products is Chipilo of Francisco Javier Mina, Auxiliary Board of the Municipality San Gregorio Atzompa, located twelve kilometers from the city of Puebla. The estabularia livestock produces organic wastes, which become a source of unhealthy and pollution due to various reasons, among which we can mention: the number of existing stables, lack of infrastructure and inability of the ecosystem to absorb wastes and lack of clean the waste management technologies to mitigate this problem. The above clearly shows that environmental problems caused by such activity are important and it is essential to generate specific solutions that help minimize them. The research objective was proposed, provide a suitable technological solution for waste treatment with power generation to "stable housing," and in this way contribute to the reduction of environmental impacts from cattle excreta and it also has the production of renewable energy for various uses (heating, DHW heating, cooking, lighting and power).

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## Introduction

The state of Puebla has an area of 34,290 square kilometers (km<sup>2</sup>), therefore ranks 21 among the 32 states nationwide, with a total of 217 municipalities, one of these areas is San Gregorio Atzompa, with an area of 15.31 square kilometers (km<sup>2</sup>), which ranks 211 with respect to the other municipalities in the state, there are a total of 9128 cattle according to the Agricultural Census 2007, its main economic activities of agriculture and livestock.

The study site is located in the municipality of San Gregorio Atzompa, identified as the Auxiliary Board Chipilo of Francisco Javier Mina, with a population of 3493 inhabitants, is distinguished by being a recognized dairy producer in the country.

There are several rural communities in the state, dedicated to livestock; this determines the problem of unplanned expansion of the city, causing gaps in services, areas of planting and breeding, one of which is the Auxiliary Board Chipilo of Francisco Javier Mina.

Chipilo community, housing is common to find the stable as a basic for raising domestic livestock and there are several stables that are part of the dairy industry space. This Auxiliary Board, the lack of a real plan of development, lack of services and housing growth itself, have caused it to be of vital importance, considering the treatment of organic waste generated by livestock for their use.

In this situation, there is needed to take advantage of this organic waste to generate electricity and heat, to generate a positive impact on the ecosystem not only appropriate but also for productivity for the same resources.

Treatment digesters (bio-digestion) is an option for the use of these organic wastes as through biodegradation and production treatment plant fuel, electricity and fertilizer will occur, attempting to achieve a cycle of sufficiency in livestock.

The stable as a basic construction for the development of livestock, allows the realization of various activities related to it. Much of the production process; It is subject to the use of electricity, so it is important consumption in activities such as:

- Water supply.
- Lighting.
- Fences voltage (electrical).
- Milking.
- Ventilation
- Machinery.
- Electric heater (Cleaning-Agua Caliente).

The use of biogas can be viable for energy saving in the stable, for carrying out their activities and become a viable energy attachment.

For the design and installation of the treatment plant based on bio-digestion must have five basic factors into consideration:

- The availability of water for mixing with the manure.
- The number of cattle that owns the family (3 cows min).

- The operation and maintenance of the technology by the family.
- Variable space.
- HOLD time

The spatial variable depends on the liquid volume and gas volume in the digester, is related to the daily load to be determined by the type and quantity of cattle.

The retention time is related to the ideal temperature required for the anaerobic digestion of the methanogen bacteria, and which may have a heating system or depend on the temperature of the environment; so you should consider an optimal temperature range in the range 10-30 °.

The ideal Family prototype, it is considered that is producing milk, because it can use the whey, to replace part of the water required for the bio-digester mixture and because the fertilizer resulting from this treatment to excreta, it generates a particularly good for growing alfalfa fertilizer.

In Chipilo most families are eligible for installation in a plant biodigester; considering a design and suited to the needs and characteristics of the region installation is needed, the digester has three main limitations and big challenge in terms of climatic adaptation, because, for the production of the plant, the temperature must be greater than 5 ° C.

This becomes a design challenge and adaptation, because in the region where the village is located, the climate and thus the temperatures tend to be somewhat extremes and changing.

Due to the government's promotion of sustainability (not full and deep) and goals set in the five federal strategic axes, where environmental sustainability and sustainable rural development is contemplated; There are some programs within the Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) and the Secretariat of Environment and Natural Resources (SEMARNAT), which allow the processing of a state subsidy for the implementation and construction of a biodigester treated plant.

To take care of the management of waste generated by production activities and seek environmental quality, media obtained to preserve the ecosystem, allowing its sustainable use and prevent pollution, to recover what has deteriorated.

Within the range of energy, Agenda 21 considers that this has a particular development according to the community in which it develops and must meet the following conditions: the standard of living of it, you can become commercial power and to promote energy efficiency. In addition to playing the requirements to be economically viable, socially acceptable and environmentally resonance.

While there are still some discrepancies as to what are the cornerstones that make the sustainability, in this research the Socio Cultural, political, environmental, productive and technological areas.

One of the most important and necessary to resume a particular design limits is the appropriation of the proposed technology, the family will be the same user; considering also to promote political and environmental sustainability area to return as stated in the Energy Sector Program (2013-2018) for renewable energy projects:

Positive environmental impact relative to the axes of air pollution, waste pollution and use of clean power generation resources.

Ensure the economic, technical and environmental medium and long-term feasibility.

Financing and contracting to allow achieving planned goals and objectives in a balanced manner in the project.

This means that the project should be triad of public policy, government programs and social responsibility that allow energy savings, seeking efficiency according to the National Energy Strategy (ENE, 2014-2018).

Biodigester Treatment Plant, seeks to achieve the cogeneration of electricity, understood according to the Public Service Act of Energy (2012), indicating that can be achieved when using fuels produced in processes for the direct or indirect power generation as long as electricity is devoted to meeting the needs of the associated cogeneration facilities, allowing the energy and economic efficiency of the process increases.

### **Rural housing in the study context**

Speaking to housing should always be considered in relation to the environment where it is located, that is their habitat, as this will determine their main characteristics, understood as habitat, organization and change in space, generated on a physical and social environment, influenced by the cultural activity of man, according to the National Housing Commission in 2012.

In Mexico they have conceptual differences between the urban and the rural area, especially in government policies and programs, where distinction according to the following indicators is done:

### **Population and degree of urbanization.**

Rural: smaller localities to 5000 inhabitants, Semi-Rural: localities in 5000 to less than 15 thousand inhabitants Urban: districts with more than 15,000 inhabitants.

### **Administrative Political Division.**

Organic Law, Municipality and Town, where a definition of urban municipalities (more than 15 thousand inhabitants), semi-urban (2500-15000 inhabitants) and rural (less than 2500 inhabitants) is given.

However, since this classification is considered arbitrary, because it characterizes the overall concept of the rural habitat, they are considered for this work the following indicators:

#### a) Characteristics of settlement:

Land use, in general for agricultural activities and integration of productive activities within the housing classification. Distribution and nature of the settlement.

#### b) Administrative Classification:

Within the Administrative Policy Division and within the entity according to the Organic Law, Municipality and Town.

#### c) Productive Activities:

Type of activities performed (primary, secondary and tertiary).

#### d) Relationship with the urban area:

Degree of interaction and distance from urban areas (at least 5 km).

## e) Culture and Traditions:

Existence in the area or region of the presence of culture and traditions that characterize the dwelling, seen as the relationship with the environment, marked by customs and visible in the development of local activities.

Rural housing is part of the built environment of a place, giving expression to the palpable influence in their community activities which contrasts with the city cultural heritage.

To (Orozco y Rojas, 2000: 3), the term of rural housing is the housing unit as a complex of buildings and areas used by the Group for its constant activity; consider housing as housing unit, production and culture.

The researchers in this study considered rural housing construction that allows the living to its occupants, in conformity with their customs and cultures, allowing them to maintain their lifestyle, subsistence services and adequate facilities, for quality of life and benefits.

When you consider milk production as part of the farm, it is no longer considered only lodging, rest and feed cattle; but also facilities that enable the proper functioning of the two main activities are labor and milking.

Being so for the proper definition and characterization of the dairy farm, it will be considered as a set of facilities that allow not only the housing of livestock with their physiological activities, but also facilitate the development of milk production.

### Methods and tools for the study

In developing research methodological instruments that combined theoretical and conceptual research with empirical and quantitative tools with other qualitative applied.

The research project was structured into the following phases:

Phase 1 (theoretical research): Collection and analysis of specialized information on the topic. Development of the conceptual framework of rural housing in response to habitat and production space. Characterization of the current production process and environmental pollution it causes. Conceptualization and practice the use of cleaner production in best available techniques.

Techniques of documentary research (bibliographic records / hemerographic, worksheets, TABLES, Tables, Matrix SWOT) Field Techniques (Sheets Observation, Reporting tables (observation / typological survey, Maps / Maps, visual memory, Interview, Questionnaire / survey)

Phase 2 (empirical research): Fieldwork research to characterize the social, built and natural area study with the participation of stakeholders through local workshops to exchange and evaluation of experiences.

Application of empirical methods and field techniques: participant observation, inference, interviews, questionnaire / survey.

This stage provided methodological tools as tokens of each of the properties, which is summarized and plotted the location of the property in relation to the external environment, the functional relationship and space physics of the house and the barn, the materials they are built The existing infrastructure, waste management, stable capacity.

Phase 3 (concluding stage): Collaborative work from the documentary analysis and field work context studied analysis and synthesis. Technological proposal develops draft level.

So a general design methodology and calculations based raises, but without standardized solutions, looking to each case study has a framework of guidelines and bases to go by, but that allows for the necessary adaptations and changes that meet the particular characteristics of stable housing

### Analysis and design criteria

Within the Chipilo Community of Francisco Javier Mina, the unit of study is the stable housing, which is characterized by the following variables:

#### - Socio-demographic aspect.

Population and the urbanization process in order to have the data fidelity, national indicators will be taken in the demographic composition of the site and its density.

#### - Economic aspect.

Highlighting the economic activities in place, services and housing characteristics in relation to units of production, income and production rates; besides resuming forms of organization and niche marketing.

- Institutional Legal and political aspect.  
Law regulations, national policies, development priorities and public institutions that serve rural areas.

#### - Environmental aspect.

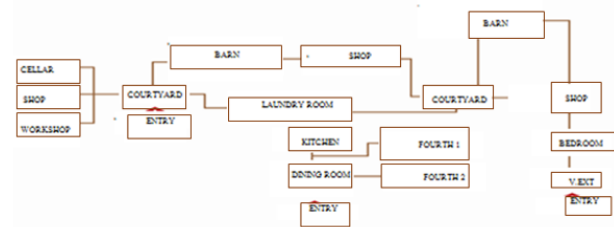
Taking into account three important aspects of the study site, water supply, solid waste disposal and drainage system.

#### - Architectural appearance.

According to the design variables (functional, physical space, constructive, expressive and environmental).

The field survey stable housing in 18 properties with a total of 40, with preparation of the sketch of the floor plan, the plant and cuts set to see the volume, functional and spatial relationship of the house and the barn was performed and operation.

In the location within the field survey, it is considered as part of the indicators for the design of digester orientation and prevailing winds, and the analysis of climate as a major hub structure to achieve the temperature of the digester.



**Scheme 1** Housing-Stable Operation of Chipilo community. Source: Authors

Within the activity of intensive dairy farming wastes are broadly related to the production process, so for the classification of waste the stages of production as is defined: feeding, cleaning pens, milking area and aging and waste generated in each.

Since the existence of different types of digesters and context-specific analysis, we decided to design the fixed dome digester low rate.

The geographic location affects biodigestion, especially for its altitude, in relation temperatures reached. In the Chipilo village of Fco. Javier Mina, it has an altitude of 2139 meters. In general it can be said that the average people of Chipilo according to the study of climate, through the Koppen-García system by Dueñas (2013) environment, temperature has a mild sub-humid climate, with an average annual temperature 17.1 ° C.



With high enough temperature and oscillation extremes.

It is making necessary to conserve the temperature inside the digester, and it is appropriate that is buried, in order to maintain the temperature in the range of 30 ° - 40 ° C, to generate digestion.

Should be considered in the daily mix, the field survey was done in the community, in the stables Dung prefer using shovel and wheelbarrow, having a storage place for it and its removal through trucks; which directly allows the realization of the dung-water mixture in the ratio 1: 1.

Retention time (while remaining the mixture within the digester) is what determines the quality of products especially biogas, if it has a proportion of less methane at 50% this is no longer flammable, as specified by Guardado (2006). Uniting the type of climate (temperature) with the type of manure (cattle) and by reviewing past experiences of others, it is considered ideal a retention period of 56 days for the region where it is proposed, with the least consider a retention period of 40 days.

The information collected and analyzed, allowed classifying the stables according to their common characteristics, serving mainly variables:

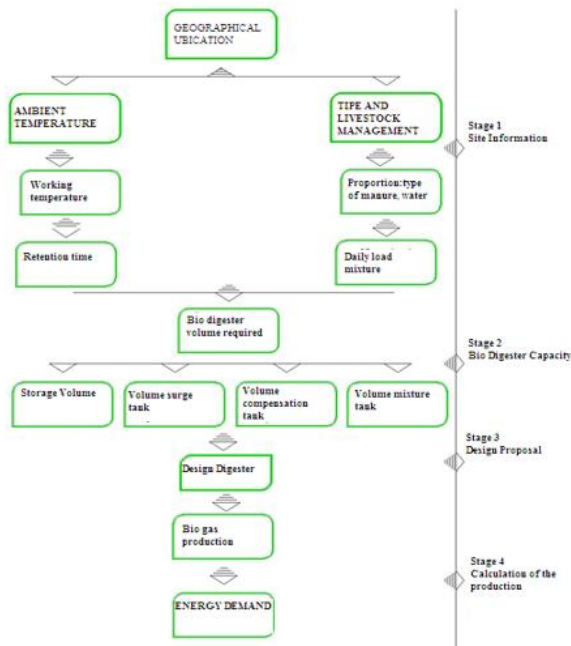
- Number of cattle heads. What determines manure management and the volume necessary to the digester?
- Free Space area that can be used for the construction and installation of the digester.
- Energetic Demand. The electrical energy required for the process through the description of equipment used in each of the stables.

Their study results in three prototypes for the classification of stable homes:

I. prototype barns are grouped with a range of 50 -100 heads of cattle, with more than 100 m2 space, with energy demand for milking bucket, lighting, water pump and alternative use of biogas for heating and Grill Of gas. It has well water supply mainly. The drain is considered to drain outlet and piped drainage ditch according to the age of the construction.

Prototype II. With a range of 40- 70 head of cattle out of a perimeter drainage ditch at the premises and piped drainage considering the position of construction and age, just about free area for the design of the digester, less than 100 m2. Energy demand for productive activity is considered with milking on the site, lighting stable, Prototype III pump. Grouping ranging from 80-200 cattle, with an open area of over 100 m2, with demand for onsite energy, lighting, water pump, gas grill, milk kitchen, boiler and machinery milking. Only one of them has urea treatment of animal waste and a functional electrical generator but can be improved for the needs of the barn. Mostly water supply is well and public water supply, drainage in most lands is cased, though there are open ditches.

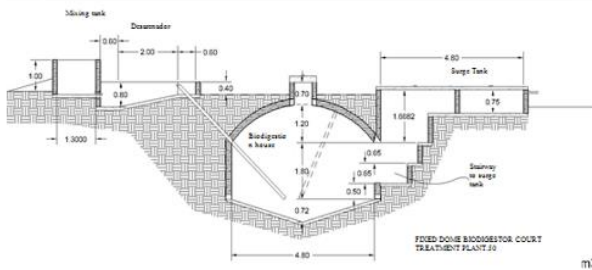
The design of the digester was made according to Scheme 2, to understand what are the steps and factors to consider in the design of the treatment plant biodigester; consists of four steps necessary to obtain adequate information, perform calculations and drawings, helping to make it accessible and easy to understand and apply, omitting in this work the math for information about the number of pages, but may be revised in handbook Design guide for biodigester treatment plant in cowshed housing, (2015) the authors.



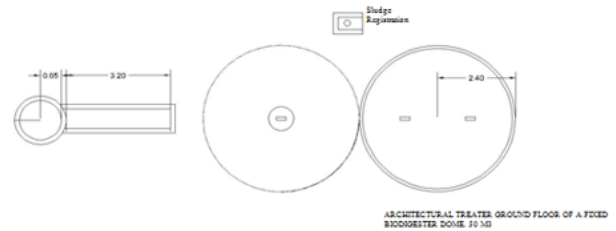
**Scheme 2** Design for fixed dome biodigester. Font. Authors (2013)

To calculate the criteria described by Guardado (2007) Design and Construction of Simple Biogas treatment plants will resume.

The project calculation and design according to the methodology defined for a stable housing Prototype I, with 50 head of cattle, resulting in the following proposal is made:



**Figure 1** Court Biodigester Type Nicaragua Treatment Plant 50 m3, based on Guardado (2007) .Made by authors (2013).



**Figure 2** Basic Plant Treatment Plant Biodigester based on Guardado (2007) Type Nicaragua of 50m3. Made by authors (2013).



**Figure 3** Fixed dome plant. Web image. F. Cut Problems biogas technology. Cuba, CUBASOLAR (No. 36, December 2006).

To calculate the biogas production, there are different ways of doing this work Guardado (2007) and Marti (2008), being more attached to the proposal, in Guardado special because considered very important as is the proportion dung water 1: 1.

It should be noted that in the production of biogas temperature, water type and quality of manure, are decisive factors in achieving a greater or lesser production of biogas.

The, albeit limited, practical and straightforward use biogas production serves as an aid in the production process stable, mitigating expenses LP within the stable housing. If you have dairy, this promotes greater savings, to be used as fuel biogas stove in the dairy, as could occur in other cases within the community.

To produce electricity with biogas several options, and most feasible:

1. Full generator, factory purchased by a dealer.
2. Armed Genset, comprising combustion engine generator, alternator and control panel.
3. Generator.

The generator factory, requires less work for its implementation in the treatment plant biodigester fixed dome, but has a higher cost, require further adjustment for installation and monitoring. Such generators are justifiable given when we are talking about large amounts of cattle in barns equipped and high production volumes.

Instead the generator assembly, from the union of the different proposals parties; can make the necessary adaptations for the needs of housing-stable, is less expensive, allows reuse items that are regional in scope and the ability to perform most of the self-construction process, with the help of a specialist in auto mechanics.

Costs vary serving providers; it is suggested to do research in each case beginning with suppliers in the region and to consult a specialist in automotive mechanics for assembling generator set.

Greater chance of success in the implementation of a digester will itself has a strict observance of the requirements to be met for the design, construction and use, and the performance of a maintenance program for the same.

### Final thoughts

The literature enlightens us about the landscape diversity of projects implemented biodigesters in the world. Comparison and synthesis allow a better idea about the proposal and implementation of a digester and generate power from the self.

Family, designed as an energy attachment, design adaptation to environmental, social and economic conditions of the study context, allow biodigester treatment plant operational best practices that include procedures to reduce the generation of pollutants from the use of excreta of animals in the production of energy use in stable activities and housing.

Design factors to consider in any digester are: the type and amount of excreta or organic to use waste as this determines the type of digester and volume thereof, for which type of treatment is required The availability of water to the mixture, and the usable space available to the user for operation and maintenance.

For the case study, including the design requirements for the digester, it was considered prioritize location due to the somewhat extreme weather site structure, being necessary to adopt strategies for the conservation of the temperature required for the process; also it considered the operation of housing-stable in each case, their type, the amount of livestock and energy demand required for the operation of the production process.

In the community of Francisco Javier Mina (Chipilo), commonly found in the home, the barn as a basic space for raising domestic livestock, there are also several stables that are part of the dairy industry.

So technology biodigesters it is a viable and sustainable alternative, allowing its use as an appropriate low-cost technology.

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**Loyalty index of students, a view from the Tesjo stage with data mining**

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**Abstract**

School dropout is the phenomenon of dropout due to the confluence of external and internal to the institutions that deal with student loyalty counterpart, the main causes of dropout are summarized in this paper according causes a school survey research including working it from the conventional part and the part that addresses the data mining helps determine the thresholds and / or patterns of dropout at a higher level; likewise the case of loyalty is addressed in Higher Education Technology Jocotitlán.

**Desertion, loyalty, factors, data mining.**

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**Introduction**

According to the Census of Population and Housing 2010, in Mexico there are 3,536,369 people attending high school, this represents 5 100 inhabitants which means that only a fraction of young people are embedded in the education system national after 16 years; exacerbating this problem since most leave school because he prefers work, the school does not meet their expectations, their parents did not want to continue studying or because of family economic conditions resulting from the lack of preparation that have had their parents. Considering the importance of achieving lower dropout rates need from the data to be analyzed reliably structuring and coherence among them is needed, it is also necessary to consider that the data contains important information not perceptible.

This paper presents a proposal to develop a system able to automatically identify in real time with students likely to drop out at the Tecnológico de Estudios Superiores de Jocotitlán (TESJo). Also preliminary results of the analysis of the personal and academic data through data mining generations of 2010-2014 are presented. The main contribution of this work is that the claims presented can be used to understand our academic community.

**Problem Statement**

At the end of the school year for each generation of the School of Engineering in Computer Systems TESJo, it shows that the enrollment of students admitted is completely contradictory to which graduates have been considered different factors that trigger this event among which have identified the following:

- a) Lack of information about the race.
- b) Lack of financial resources.

c) Lack of vocation for the race.

d) Poor academic performance.

In this work different harvesting techniques dropouts are described in other case studies. Also mentioned systems to automatically identify in real time with high students likely to drop as data mining, to complete an analysis of Higher Technological Studies Jocotitlán where there is an important fact of loyalty shown to be It considers important regarding the dropout rate.

**Development****Dropout factors based on research**

School dropout is the phenomenon of dropout due to the confluence of external and internal to the institutions of higher education that has to do with factors of social and personal context of the student causes; as quoted by Rodriguez (2011) in the study of dropout; against party loyalty can be understood as a high degree of commitment and satisfaction with student experience at the institution where you are.

In this sense we have generated several studies to identify the main causes of school dropouts to decrease this situation and eradicate this phenomenon as possible. Such is the case of the University of South Colombian Education mentioned that the main factors dropout according to Sanchez (2005) are: personal, academic, socioeconomic and institutional. Also in a publication by the National University of the Coast, Santa Fe Argentina Zandomeni, a sample of 77 students was considered, the results obtained from this research show that the dropout involves several factors like interests, expectations, inclinations towards one or the other area of expertise and institutional issues also appear and educational organization, personal.

Family and work that triggers both students, educational institutions and government agencies involved in university politics. In the analysis of explanatory models of student retention in college written by Donoso (2007), desertion is a way of weakening the initial intentions to follow up his career, where one of the main factors for the output are family history, skills and previous schooling.

The academic factors as the problems of low achievement, repetition, lack of discipline and study methods; deficiencies in academic programs that deal with traditional teaching, academic dissatisfaction, lack of career guidance that is manifested in an inadequate choice of career or academic institution and lack of fitness; are the main causes of dropout as observed in the study of Autonomous University of Puebla by Wietse de Vries (2011). In this investigation it was established that the main causes of desertion were complicated schedules, was not the vocation, the profile of the race, worked and the difficult economic situation; Taking these considerations suggest including reviewing schedules to make them more flexible and does not affect students and promote a system of scholarships for those in need.

Also the college dropout in Mexico in the experience of the Autonomous Metropolitan University Rodríguez (2008) and based on a comparative assessment of populations through surveys deserters and workforce between generations 1994 and 2003 noted that 46.9% defected definitively and 42.1% rejoined another race, which is a high percentage for those who leave their professional studies, also it mentions that desertion is early ie in the first three quarters of the race; Among his most notable dropout points they were found: work activity, home economics and school performance.

An outstanding factor in the dropout are cognitive problems, as cited in a test applied by the Polytechnic University of Sinaloa, in this study expert system of university preferences to a population of 206 aspiring different engineering, it was noted that students whose profile Noted for the test match the selected race had a high academic performance, while those who agreed not show low interest and academic achievement, encouraging the defection as quoted Briseño (2011) arises in these cases. Also a history found at the Autonomous Metropolitan University is that most of the dropout occurs in the first semester especially when there is the registration period to freshmen in universities, ie students stay in schools second option until they again try to enter schools and desired career: the study was conducted in eight races and 1577 subjects described by Duran Encalada. In this analysis the dropout phenomenon is observed in three modes: the voluntary, ie that incurred by statutory provision and the potential when the student ignores their academic activities for whatever reason.

Also the socio-economic factor such as low family income, unemployment, lack of family support, incompatibility between work and study schedule. Strategies to overcome the dropout according Velez (2004), is a predominant factor, since a study was conducted to 378 deserters through two questionnaires, determining that the economic problem is one of the main causes by 59% followed by incompatibility with the race with 29%, coupled with this dropout is exposed between the first half of the race with 89%. Similarly with a sample of 749 young defectors 51.4% decided to work and put aside their professional studies.

### Dropout factors and data mining

To predict the student dropout from the raw material is inevitable start from the data that can provide voluntary and involuntary student, since they have more information than is judged by the naked eye, in this sense data mining to determine the causes attrition using historical data, a process of knowledge discovery in databases (KDD), or "the process of extracting previously unknown information, valid and useful in large databases and uses the information to make decisions crucial "as quoted Azoumana (2013).

In this context the analysis of dropout in the Simon Bolivar University, according Azoumana (2013), applied to a population sample of 707 individuals using data mining techniques, using decision tree algorithm and the algorithm of neighbors k closest, WEKA, work Mark Hall (2009) for generating the results are used; half loss, financial difficulty entering the labor market, other interests and indeterminate, five were considered causal. Its results have a margin of 94% confidence determining that the main cause of attrition is unknown factor with 65% according to the five grounds, followed by financial difficulty with a loss of 8.7% and 4.2% semester.

It is convenient to say that one way to predict the dropout is to use techniques of data mining, as quoted by Ventura (2012), where he worked with a sample population 670 and 77 attributes or variables that were selected 15, in step of data reprocessing algorithms re-rolling as SMOTE WEKA, at the stage of experimentation were used 10 classification algorithms provided by this tool is manipulated because classification rules are obtained with decision trees easy interpretation will identify students with problems or trends to abandon their studies, which will allow for an adequate system of early warning of desertion.

Proposal and results tesjo loyalty index

The present work was focused in the 2010-2014 Generations career in computer systems engineering from Tecnológico de Estudios Superiores de Jocotitlán, considering that 831 students were surveyed with turarías format, record of identifying students tesjo-fo-39 ; which questions related to academic, socioeconomic and family background of each student that can help determine the main causes of dropout or loyalty index presented by the student.

It is also noted that each year school starts the race for the freshmen are about 130 of them for the generation that graduated in 2014 were under 40; It can be determined that more than 50% of students are lagging or did not complete the race. Therefore an automated system that is able to determine the main causes of desertion and act on the data collected, is proposed steps that are considered for the proposal are seen in Figure 1.

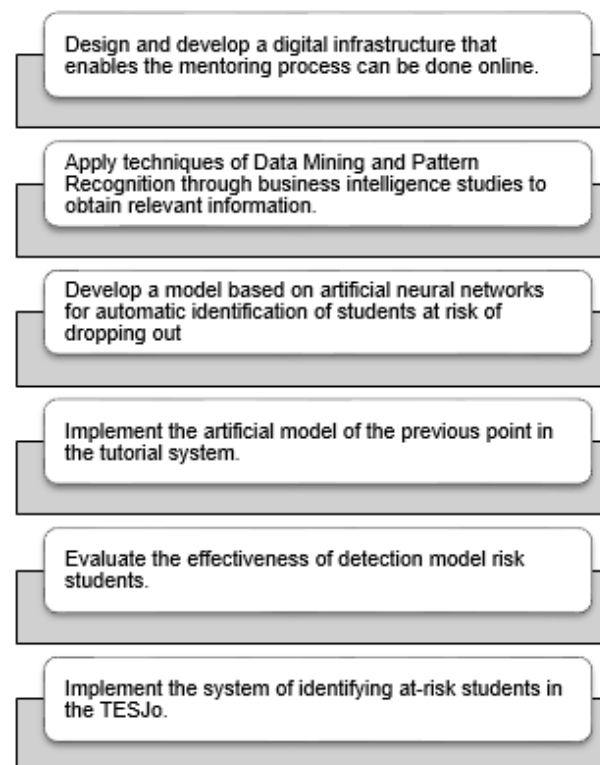
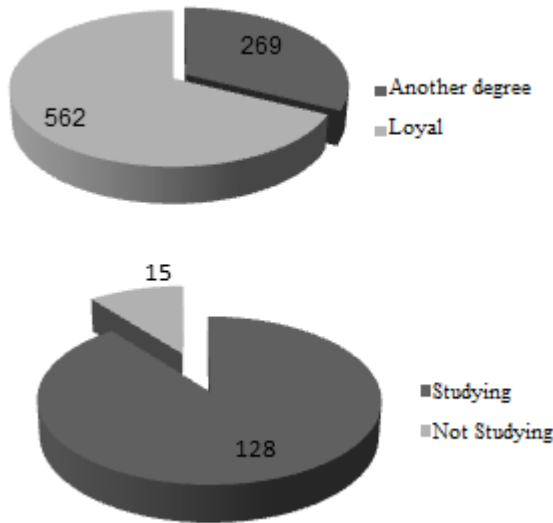


Figure 1 Proposal dropout rate.



So far they have worked the first two steps of this proposal and has obtained the following preliminary results:

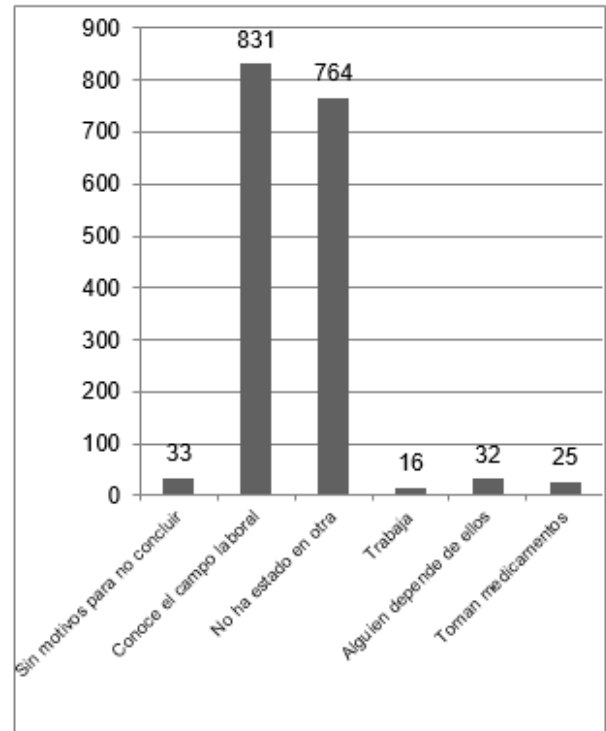
Of the 831 students surveyed, 269 students have another degree in mind, it is obtained the following chart, Figure 2.



**Figure 2** Index loyalty

60% of students who take medications, their parents have different studies of secondary school

All Students 4% have no reason not to conclude, was his first choice and have no degree in mind, ie are completely loyal to the race; and some other data are seen in Figure 3.



**Figure 3** Desertion factors

Of the main causes that have been identified to have no loyalty to their professional studies at first point is that the students have another career in mind what hinders this point since students are there because they have no other at the moment and sooner or some decide to retire early; however is to guide the student to leave coupling and adapting to the race, the approach to the likes without taking the decision to leave; is also the action of the race was promoted as is, with profiles of study and plans that emerge from this so there is no confusion to recruit students.

The economic issue was addressed by promoting all scholarships that students can get both from the institution as government departments, all done in the registration process and during the semester.

In the case of those who are currently taking medication, it has been observed that the insurance offered by the institution to enroll helps them to resolve this situation even in severe cases.

### **Acknowledgements**

Tecnológico de Estudios Superiores de Jocotitlán

### **Conclusions**

The study shows that the problem of dropout is mostly affected by the preferences of students to another career that meets personal needs or tastes, considering that 32% of students in this sample of students has either poor performance Academic and / or incompatibility with the race, to solve this part raises institutional strategies oriented to refocus and motivate students attention, such as mentoring programs that give students continuous monitoring, raising the risk factors and the states desertion; also make a selection of candidates remainder subjectivity to the procedure used and adheres to the profile of the race, supporting the academic performance, this of course does not remove responsibility the student's academic performance.

Another factor impeding loyalty to the race is taking medication or disease may suffer the student, for these situations the institution to all students who are currently enrolled technological are provided health insurance.

And finally, the economic factor because only 2% of the students work and almost 4% have someone under them, to solve this factor acquaint the students of the various scholarship programs that provide both educational institutions and government.

In this sense the use of data mining to predict dropout is certainly adequate for consent to gain a thorough understanding of the data and can analyze the behavior of the student generating useful learning-teaching thresholds that allow early identification of the pattern of institutional neglect.

It certainly that a job that can address a national and even international issues, however each case study is different and each of them is unequal causes and prevention measures that should be covered in different ways.

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A. Submission of papers to the areas of analysis and modeling problems in the areas of Education, Crowdsourcing, Operation of Academic Corps, Regional Development, Fiscal, Architecture and Networks.

B. The edition of the paper should meet the following characteristics:

-Written in English. It is mandatory to submit the title and abstract as well as keywords. Indicating the institution of affiliation of each author, email and full postal address and identify the researcher and the first author is responsible for communication to the editor

-Print text in Times New Roman #12 (shares-Bold) and italic (subtitles-Bold) # 12 (text) and #9 (in quotes foot notes), justified in Word format. With margins 2 cm by 2 cm left-right and 2 cm by 2 cm Top-Bottom. With 2-column format.

-Use Caliber Math typography (in equations), with subsequent numbering and alignment right: Example;

$$\sigma \in \Sigma: H\sigma = \bigcap_{s < \sigma} Hs \quad (1)$$

-Start with an introduction that explains the issue and end with a concluding section.

- Items are reviewed by members of the Editorial Committee and two anonymous. The ruling is final in all cases. After notification of the acceptance or rejection of a job, final acceptance will be subject to compliance with changes in style, form and content that the publisher has informed the authors. The authors are responsible for the content of the work and the correct use of the references cited in them. The journal reserves the right to make editorial changes required to adapt the text to our editorial policy.

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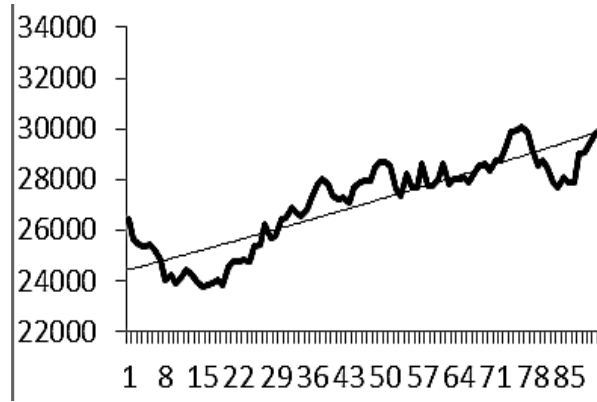
D. The identification of authorship should appearing a first page only removable in order to ensure that the selection process is anonymous.

E. Charts, graphs and figures support must meet the following:

-Should be self-explanatory (without resorting to text for understanding), not including abbreviations, clearly indicating the title and reference source with reference down with left alignment number 9 with bold typography.

-All material will support grayscale and maximum size of 8 cm wide by 23 cm tall or less size, and contain all content editable.

- Tables should be simple and present relevant information. Prototype;



**Graph 1** Stochastic versus deterministic trend

F. References are included at the end of the document, all its components will be separated by a comma and must the following order:

- Articles: Kejun, Z. (2012). Feedback Control Methods for a New Hyper chaotic System. Journal of Information & Computational Science, No.9. Pp : 231-237.

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VALENZUELA, Teresa, LEÓN, Yolanda y LUNA, Leticia

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“Academic bodies in Public Schools in the State of Mexico”

VELÁZQUEZ, Héctor, GONZÁLEZ, Lucio, REYES, Basilio

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CERVANTES-ROSAS, María de los Ángeles, CONSTATINO-LEMUS, José Mallel and CARRANZA-ORTEGÓN, Gabriela

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“Habitat improvement in Chipilo of Francisco Javier Mina. Puebla: Use of biogas as an alternative energy in the productive activity of dairy cattle animal house”

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