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INDEX

Articles

Maya writing	6
Living art in the weavings of Venustiano Carranza, Chiapas	31
The sacred dimension among the tojolabal	47
Violent deaths in Mexico, a synthesis of two recent decades	61
Cocoa materials of pharmacological interest, (<i>Theobroma cacao</i> L.)	74
Academic plagiarism from the perspective of copyright	93

Academic Papers

The School of Cosmic Rays in Latin America 109

Factors which contribute to obtaining 500 points on the TOEFL exam as a requirement for obtaining a degree in Tourism Management from the Autonomous University of Chiapas 116

ARTICLES



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Maya writing

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ABSTRACT

This article makes a brief tour on the writing among the Maya of pre-Columbian, summarizing some of its main features, obtained by great advances in its decipherment and knowledge. So says the basic aspects of their history, antiquity, content, languages reflecting, literary figures, stands, writing resources, types of signs as well as some grammatical rules and composition. Also made references to the value of writing, in that complex pre-Hispanic society and some notes about writing in other Mesoamerican cultures.

Keywords: mayas, writing, glyphs, literature, Mesoamerica.

The Mayan civilization is an ancient culture, with established villages existing since 1200 BC (Healy 2006: 24), Cities From 500 BC (Clark, Hansen and Perez, 2000: 464) and complex urban systems interconnected with roads from 200 BC (Hansen 1998). In the centuries prior to our era, they reached a high level of quality in their monumental buildings, with the Mayan corbelled dome and arch decorating buildings, developed complex sculptural and pictorial art, as evidenced by the City of San Bartolo in Guatemala (Saturno, Taube, and Stuart, 2005 ; Taube et al, 2010) and begun to use a writing system that reflected many of their cultural interactions and great mathematical and calendrical achievements. But above all, their writing incessantly reflects a complex, prosperous society until it reaches its period of splendor during the III to X centuries of our time. That stage, by analogy to the history of the Greco-Roman world, has been called by specialists for decades as the Classic Period.

Only five zones in the world invented writing- in ancient Egypt, Mesopotamia, China, India and Mesoamerica (Woodard 2004). From these locations neighboring and subsequent cultures copied and adapted the languages and diverse systems with typical resources such as inverting the meaning of the sign. In Mesoamerica, all signs indicate that it was the Olmecs who were the inventors of writing. There is scattered evidence, with questionable dates for being written in stone, such as the block from Cascajal from around 800 BC (Skidmore 2006) and Monument 13 from La Venta around 400 BC (Lacadena 2008a). The dating of ceramics is more accurate with scriptural evidence from San Andrés, Tabasco from around 650 BC (Pohl 2005: 10). Around 500 BC the Olmec began to decline and its main capital of La Venta was finally abandoned around 400 BC, but the Epi-Olmec peoples developed a writing system that has been called *istmeña*, of which a few examples have been found, although with long texts. The most famous is stela 1 from La Mojarra (Pérez 2005). With this knowledge the Olmecs influenced the Zapotecs around the middle of the first millennium before our time, in San José Mogote and Monte Alban (Marcus and Flannery 2001), with the people of the Pacific coast, such as Izapa (Lowe, Lee and Martinez 2000) -long considered as *Mixes* and today more thought of as Zoques and Takalik Abaj, cosmopolitan population with clear Epi-Olmec influences at Izapa, with the Maya and in the Guatemalan highlands. The Chalchuapa culture of El Salvador (Ohi 2000); the highlands of Guatemala in Kaminaljuyu, El Baúl and El Porton (Sharer 1998) whose exact cultural affiliation is still discussed; and the Maya as seen in San Bartolo (Saturno, Stuart and Beltran, 2006). All this was during the formative or Preclassic/Late pre classic period, between 400 BC and 250 AD.

Interestingly all of these cultures had a tradition where two fundamental aspects can be seen: the use of writing and the representation of individuals with attributes of power such as ceremonial bars, feline heads, and masks of fantastic beasts or claws, sculpted in relief in stone (Grove and Gillespie 1992). From the Classic period, most of these cultures stopped producing stone monuments and their cities stopped growing, although they weren't abandoned until six or seven centuries later. The Maya were the only ones who continued growing demographically, developing increasingly numerous cities and monuments and almost always accompanied by writing.

Undoubtedly, the most extensive scriptural evidence is from the Maya, with about fifteen thousand texts (Houston 2000: 131) over twenty centuries. It is a considerable figure, in my opinion, if we think of other peoples with evidence of writing in Mesoamerica, with just about 200 texts surviving in various languages -without considering the Nahua texts with glosses in Latin characters that contain mostly lists of villages or people and are more numerous. At the same time it is a low figure if we contrast it against the 2 million Egyptian texts (Woodward 2008a), where dry weather contributed greatly to their perpetuation. We know that the Maya wrote in countless types of material: stone, bone, shell, jade, and obsidian- but also in softer materials such as wood, paper, plaster and a lot of paint that decorated rooms and exteriors (Johnson 2014: 11). Inclement sun, humidity, the jungle and time has taken away the majority. However the Maya culture was characterized as perhaps the only ancient culture to resort to writing on their clothes, as can be seen in the representations in paintings, ceramics and stone (Valencia 2009). Not only that, they also painted images of deities or mythical characters on their clothes, as seen in characters of the Bonampak murals.

The evidence of the oldest Maya writing is from 300 BC, and comes from a painted block on a column with 10 few glyphs found in the fill of a substructure in the pyramid of paintings of San Bartolo. For specialists, it is an indication of a clearly developed writing, suggesting that the Maya wrote long ago. In fact, about a dozen short texts have appeared in the material of the rubble of San Bartolo with similar ages (Stuart 2014). We know that paper was manufactured since at least 500 BC, as the evidence of tools suggests in Motul de San José, in the Peten and in Blackman Eddy in Belize (Castellanos 2007: 30). In addition to San Bartolo, just over thirty examples of Maya writing from the Pre classic or Late Formative (400 BC-250 AD) periods, the majority of unknown origin, denote however their belonging to a system that still escapes decipherment by specialists (Mora-Marín, 2001), except for isolated glyphs. These cases reflect writing with clear links to contemporary systems of neighboring cultures, particularly the isthmus. Some signs are almost identical but reversed in the direction or disposition- a typical resource

as has been mentioned and which is frequently mentioned in the history of the scriptures.

Writing was increasingly taking greater relevance among the Maya. Over time, simple columns with a few complex glyphs hidden within complex moralistic compositions converted into extensive monuments with approximately 2,500 glyphs, such as in the steps of Temple 26 of Copan in Honduras, which is the longest text that has survived to today. Researchers originally thought that probably the Maya had a writing system during the Pre-classic and another during the Classic. Today, everything points to being the same system that evolved and achieved spectacular developments in the second period. There still lacks an understanding and deciphering the more ancient texts, which is now only partially understood, alluding to the general sense that has been mentioned previously.

About 1,100 written signs have been identified throughout its development to the Classic Period, although the Mayans used in a specific time around only 500. Other signs were constantly being developed and others abandoned, while receiving influxes of Mayan languages or those of other cultures (Kettunen and Helmke, 2014).

All writing systems in the world, in any time, have only two types of signs: logograms and phonograms. The first represent a value of the full word, the second represent sounds and can be syllabograms or alphagrams. Writing systems with only one type of signs do not exist, they combine everything. We basically use alphagrams and some logograms- for example '4' is a logogram which is read as "four", the latter written with 6 alphagrams or alphabetic signs. The Maya used a system of logograms, which are more than 850 of their signs, and syllabograms of which there are about 200, although many of these are homophones because in total there are 80 syllables in the Classical Mayan language – there are no syllables for the consonants d, f, g for example, but they have other that we do not use such as the glottalized *ch* ' , *k* ' , *t* ' or *tz* ' (see syllabary in Kettunen and Helmke, 2014). The syllabograms of Mayan writing are composed of consonants and vowels, CV as linguists call them. There is nothing to appreciate if a sign is a logogram and when it is a syllabogram. Today, by linguistic convention, our writing system of logograms is fully capitalized and phonograms all in lowercase (figure 1).

As with any system there are allografts- variations of the same sign; homophones- different signs but with the same reading; polyvalences-when the same sign has different values- one as a logogram and another as a syllabogram-and signs that they used at a particular time or in a particular region. Reading was done through paired columns, from top to bottom; although they made texts in a single column, in a circle, inverted L or inverted U, mirrored or in the form of a woven mat, thus altering the order of normal

reading. The signs were grouped in a sort of box or cartridge that usually contained the words, but not always and the hieroglyphic cartridge (Lacadena 2013) were dominant.

It is totally wrong that writings evolve alphabets. This depends only on the development of the people, of the transmission of writing systems and other factors such as the story itself. Proof of this can be found in the Chinese system with more than 5,000 signs, the great majority being logographic and with more than 3000 years of use (Woodward 2008b: 136-162). There also does not exist in writing signs called ideograms or pictograms, pretending that pictorial signs are legible when they can be simply interpreted, starting from the possibility of understanding what they represent, their context or other sources. It is easy to get confused in these aspects since we will see how all scriptures begin with strong iconic loads, and therefore many paintings or drawings mean something but cannot be read, for this there be by convention a value in a specific language, whether by sound- Phonogram- or be a complete word-logogram. It is important to stress that the images of the codices and monuments, particularly in Mesoamerican Studies, are highly relevant and provide valuable information for understanding and interpretation, but they are not a system of actual writing. They support mechanisms of oral tradition.

Not only are the academic constructions elaborate but also improbable-in the literal sense. Like semasiography (Boone 1993), which proposes a writing system without 'words', supposedly readable from pictorial representations for different peoples with different languages, having an almost universal significance- which is something never before seen in human history. Or Galarcist school (Mohar and Fernandez 2006; Galarza and Libura 2002) which advocates for a-plastic-symbolic-phonetic grammarian writing, denoting its attempt to combine every way possible, even the color or position in a pictorial composition, to espouse original writing systems that have not ever been seen in the history of man in another latitude or time. This school arose when trying to combat ideas into vogue in the seventies in Europe (Mohar and Fernández 2006: 10), the latter being absurd because they thought that the Mesoamerican peoples were semi-civilized for not having writing, for never supposedly reaching that accomplishment.

Many of these distortions come from inadequate theoretical framework. In our country until recently, for example, there were no studies on writing systems invented by humans that also considered linguistic issues of language- from there many aspects are clarified. Proof of this are the so-called reconstructions, made by epigraphists-name that has been used to describe students of Maya writing, more by extension that rigor, as epigraphy is specifically the study of writing on hard materials- in the case of Maya writing, completing words where some syllabic parts are not reflected which is

made from mechanisms identified as abbreviation or knowledge of a language and script, which determines how they behave and therefore how to remake a text that presents omissions either by deterioration or by using abbreviations (Lacadena 2013: 12-13). For instance, we wrote “Mr.” but we know that it reads *Mister*, rebuilding between brackets the omitted alphagrams. I have personally been at conferences where some scholars refuse these reconstructions, for lack of familiarity in studies of writing systems.

This does not mean that the codices of the Mexican plateau or Mixteca, for example, were documents that lacked writing, since they usually only contain place names, personal names and dates mostly from logograms. Leaving the pictorial representation in their books, as we have said, was to support an oral narrative, a key part of Mesoamerican cultures generally west of the Isthmus of Tehuantepec. The regular use of writing does not determine the importance nor did neither the quality nor the degree of civilization attained by a culture- it simply shows part of its idiosyncrasy. Do not forget that Homer himself has been considered part of an oral tradition that very belatedly had his stories discharged into text (Bowra 1948: 16). We will discuss other writing systems in Mesoamerica later.

Maya writing stands out for its high graphic content or iconic charge, which has sometimes been confused in its decipherment. But the graphics load is not exclusive of Maya writing. Actually all writing systems began in this way, some despite the centuries continue to use very graphic elements, like the Egyptians. It wasn't until cuneiform or Chinese that had very clear graphics loads at an early stage (Woodard 2004). Those who would say that our own sign for the letter A, for example, was originally the head of a bull in the proto-Semitic form, turned to the left by the Phoenicians and returned by the Greeks, thus passing to the Romans (Moorhouse 1961). Like all systems, graphical content originally determined many of the values of reading and phonics, through mechanisms such as acrophony, signs that taking their sound from the initial part of the word they represent. A case in Maya writing is the syllable *chi*, represented by a hand that unites the thumb and forefinger, perhaps representing *chij* = pinch; or the Maya syllable *yo*, when it represents a leaf and derived from *yop*, *yopol* = leaf.

Focusing too much on what the signs represent is not a good methodology, and has led to some confusion. It is perhaps the last thing to consider in deciphering. The graphical charge of Maya writing is a big part of its appeal. Often they seem to be simple lines or elementary representations, and only when the work of reproducing the signs does one realize how complex they are. This helps a lot to know and distinguish them (Lacadena 2010).

These graphic loads allowed the Maya rulers to constantly return to capture in their headdresses and ornaments the elements of writing by

prominently combining decorative elements with ritual aspects and texts that proclaimed the name of the ruler or his ancestors and dynasties (Figure 2).

The Mayan signs, starting from their representation, are basically divided into two variants: the symbolic and those of the head- the ideas expressed by Dimitri Beliaiev in the workshop advanced than he gave in 2013 are still present. The first are the representation of objects or parts of objects or body parts which are schematizations of natural elements or parts of something. The head variants are signs that are head-anthropomorphic deities or human-beings and animals. In various examples there are variants of the same head but representations of the full body, fascinating in their shape and interaction, in addition to the singular idea of a script that takes bodily form (Figure 3).

A feature of the Maya system, which has greatly helped in a large part to the recent decipherment of writing, is use of the resource called phonetic complementation. This is the use of syllabograms, to indicate the correct direction of reading the signs or words-we are no strangers to these mechanisms when we put 1st or 4th, indicating that reading is not ‘one’ but ‘first’ and is not ‘four’ but ‘fourth’, respectively, in these examples we use logograms with alphagrams in phonetic complementation. The phonetic complementation can be at the beginning of the word or the end. In the example that is shown (Figure 4) the reading is, in the first case, *waj* “tamale” and the second *tuun* “stone”. It is not the only scriptural resource- There is the rebus procedure where the value of reading for a logogram-which in itself is a word-is used to construct a different and longer word, adding logograms or syllabograms. There are also auxiliary signs as a resource, they have no reading value themselves but help it. Those of our current writing systems are the punctuation or diacritical markers. Among the Maya there exists for example the duplicator, which consists of writing two points usually in the upper right of a sign which indicates that the value of reading a syllable or logogram should be read twice (Lacadena 2010: 9-19 6; figure 5).

Like other systems, the Mayan writing tends to simplify and superimpose the signs, sometimes leaving only part of them or hiding a part behind each other (Figure 6), also called overlay. Or they make an infixion, when a sign is inserted fully or partially in another (Figure 7). But they also combine or merge elements, mixing characteristics (Lacadena 2010: 8; Figure 8).

What language reflects Mayan writing? Experts call it *Cholano* (Houston, Robertson, and Stuart 2000), also known as Classic Maya language, which prevailed in the southern lowlands formed by Belize, the Peten region and the Rio Pasion (Passion River) . The Cholano derived during the Classic period, in a western variant in the region west of Lake Peten Itza, the Usumacinta River and the eastern lands of the current Tabasco, with differences in word endings. The original or oriental Cholano resulted during the time Post classic and

Colonial to Cholti and Ch'orti'; while the western resulted in the Chontal and Chol. In the Yucatan Peninsula the Yucatecan-antecedent of spoken Yucatec- soon was reflected in Maya texts, which in fact shows relevant features such as the expression of the positions and titles rather than names, to the contrary of Cholano. Yucatan shows varying degrees of combination between Cholano and Yucatecan as to the languages of their texts. Chichén Itzá is quite Yucatecan and very syllabic, Ek Balam meanwhile is more Cholano but with Yucatecan names. Scholars have come a long way to be able to distinguish some degree of dialectal variants of the same language such as the Yucatecan, which can be distinguished from Lacandon or Itzá (Davletshin 2013: 72) at the time of the Late Classic (600-900 AD) Yucatecan dialects. In the final centuries of the Mayan splendor, during the prescribed Late Classic new linguistic variations arise in the texts. In Tonina, Chiapas, the *tzeltaleano* (Ayala 1997), which is the antecedent of Tzotzil and Tzeltal appears. Meanwhile in Chama and Nebaj, in the beginning of the highlands of Guatemala, further south, there are traces of the Kicheano linguistic group (Beliaiev 2005). But by far the predominant language in writing is the eastern Cholano, all surviving texts are written in this language with variations especially in terminations, motivated by the other mentioned languages. It has been possible to reconstruct the classic Cholano largely thanks to its derivations indicated in Ch'orti 'and Cholti- although these are extinct, known by colonial dictionaries who tried to compile- the eastern branch, Chol and Chontal from Tabasco and Chiapas; but also epigraphers of all Mayan languages, extinct and not, were helped by dictionaries or colonial references.

Pre Classic texts have not been able to be deciphered except for some signs. Those of the Classic period have mostly been deciphered. While much remains to be done, as there are still around a quarter of signs un-deciphered which are known by a few examples, without complementation that clarifies their reading or evidence to assist in their decipherment. Progress on this point has been very significant from the beginning of this century, considerably enriched by linguistic contributions that have allowed the understanding of much of classical Ch'olan language; as its transitive verbs-with their active, passive, and anti-passive – half passive and intransitive voices, depending on whether the action falls on an object or not; on the character aspect of their verbs, which indicate no time, but if the action was performed (completive), if you are doing it (progressive) or has not been done (incomplete); their pronouns absolute or ergative (see Lacadena 2010).

Although one must consider that the decipherment has many chapters since the nineteenth century. Advances and setbacks were giving for decades, from the mid-twentieth century advances by Knorosov and Proskouriakoff-

the first in the Soviet Union and the second in the US-let specialists identify, without reading, the meaning of certain signs. In the seventies the Roundtables of Palenque give new impetus and soon advanced considerably. The story of the decipherment, which began in the late eighteenth century, is an adventure of Western human intellect (Houston, Chinchilla and Stuart 2001; Coe 1995).

Most words in classical Cholano consist of consonant-vowel-consonant CVC, with the CV syllabograms, the construction of words in Maya writing syllables or phonetic complementation using syllables after a logogram necessarily result in the termination in a vowel. That is why elation is done, which is a mechanism that bypasses the vowel pronunciation of written termination except in rare exceptions. This is another argument that suggests that the Maya invented writing, adopting and adapting the system of a language, such as the Mixe-Zoque, which used vowel endings (Wichmann 2006: 2).

The classic Ch'olan language had unique characteristics that were difficult to express in the Mayan spellings, mainly aspects related to vowels: short, long, followed by suction or glottal and called rearticulated. For example for the vowel 'a' would be: a , aa, ah, a ' , A'A, respectively. How do you express this in graphs? A short while ago epigraphers realized that the Maya wrote with vowel harmony or vowel disharmony, depending on whether the vowel was in a syllabogram or was the last member of a logogram-corresponded or not to the vowel of the syllabogram that came next-although the latter vowel is pronounced. If the vowel harmony is given, then the first vowel is a short, simple mechanism. But when the second vowel is disharmonic of the first vowel, then the other 4 examples of vowels can be presented: long, with suction, with glottal and rearticulated (Houston, Robertson and Stuart 1998; 2004; Lacadena and Wichmann 2004). In a variable scheme and whose rules are still discussed among epigraphistas, the most viable scheme in my opinion is the following proposed in 2004 by Lacadena and Wichman:

1. If the first vowel in the logogram, or on the first syllable, is: a, e, o, u and the second vowel is i then the vowel is long; Examples: B'AK-ki, b'aak "bone"; ke-ji, keej "deer" (in Yucatecan); It is the same if the vowel is i and the second vowel is: a; Example: AHIN-na, ahiin "crocodile".
2. If the first vowel in the logogram, or on the first syllable, is: e, o, u and the second vowel is a vowel, it is then followed by a glottal; Example: se-ka, Se'k "name of the month"; it is the same if it happens that the first vowel is a, i and the second vowel is u; Example: CHAN-nu, Cha'n "watch, see."

3. Another scheme is to double the vowel, but not the second part of a CV syllable, only the vowel; for example: te-e, which gives the word te ‘meaning “tree”’.

Although these rules work in most cases, there are some exceptions that are still under study—all examples are taken from Alfonso Lacadena (2010) .

Most of the texts that have reached us are in stone. A smaller portion is found in various objects such as wood, bone, shell and others. But there is another important quantity in ceramics that, unfortunately, come largely from looting. Although its use is debatable, it is precisely the recent decipherment of writing which can qualify, in general, their authenticity. Its text is not easy at all. On ceramics we usually find two texts, one brief secondary one, which refers to the scene and is inserted therein, accompanied by another main text which is a little larger and usually on the edge, which refers to the dedication of the vessel, if it is glass or a dish. Boot identifies 26 vessels of different types (2005) - its content, if it was for atole or cacao- and the name of the owner of the vessel and his titles; we know it as a ‘dedicatory formula’ (Stuart 2005a). For some years it was called the Primary Standard Sequence, unable to be read but appreciated for the reiteration of some signs (Coe 1973). It’s a pity that the texts of the scenes are brief, because many ceramics contain painted scenes of myths in which the Mayan gods are represented, a huge cultural wealth that just lets us see some signs that help their understanding (Robicsek 1981). The texts are also short on the objects, which also indicate the type of object -earring or bone- and the name or title of the owner.

The most common stone monuments, stelae and the altars that sometimes accompany them, deal mostly with their rulers whose main title was k’uhul – sacred lord. The Classic Maya world revolved around these characters. It is peculiar that the deities appear a few times in monuments, in fact the ruling personifies many times to different deities. These texts refer mostly to the lives of these rulers, their birth, enthronement, his ancestors, the commemorations of the end of calendrical periods – which were very relevant to these people-, capture of enemies, political relations, wars and death. While they can be seen as very historical, we should not lose sight that this society is deeply religious and everything has a ritual character (Martin and Grube 2008). Two cities stand out for a style not linked to leaders in their records: Pomoná and Xcalumk’in; the first seems to allude to calendrical rituals and the second refers to scholars and scribes.

Both in ceramic and stone, many Maya artists inscribed their name on the piece of art that they made, leaving their identification and fame for posterity.

Like Western artists since the Renaissance, the classical Maya artists signed their works (Reents-Budet et al., 1994: 48-50).

The writing had a very important function. It was an instrument given by the gods and provided a prominent social prestige, especially for the elites. It is not believed that all social strata had access to this knowledge. The monuments in public squares referred to rulers- talking about their lives and rituals, which were most likely read by the common people. Some basic signs are embodied to ceramic types that reached most social strata, which were easy to understand, allowing the reading of elementary strata of known aspects of the writing system. The writing was such an important status in several sites in Yucatan, where the Maya society was entering deep crisis by the ninth century. Several sites left evidence of pseudo-glyphs; Similar signs that had no reading value (Grube 2000), denoting the loss of that knowledge but prolonging the use of writing, which surely impressed their subjects, but above all their rivals or allies, though not more than as fiction.

Most vestiges of the Mayan writing are linked, as we externalize, to the ruling classes. There is little evidence of expressions linked to the life of other classes or other strata. Some individual objects are highlighted.- above all, the murals of Calakmul in Campeche, which were recently discovered and show scenes of what is probably a market, people performing sales of snuff, bowls, food, beverages, among other things (Martin 2012) . This finally provided a look at another aspect of the life of cities, in this case, trade.

In Teotihuacan, a powerful city that influenced all of Mesoamerica and beyond, has few of its own scriptural records was where Mayan glyphs were found. The style of the graphics date from around 500 A.D. (Helmke and Nielsen s / f), and are impossible to decipher by the incompleteness of their status except in isolated cases. Highlights include colors that are not common among the Maya but very much for the plateau: orange, pink, light blue and dark blue, among others. In Copan, on the other hand, there exists in Temple 26 a seemingly bilingual text (Figure 9). On the one hand the typical Mayan glyphs are shown in their full body versions and parallel characters with Teotihuacan characteristics (Stuart 2005b: 387). It is attractive to think they were from the big city on the plateau, but we have never found any remotely similar sign in Teotihuacan, or anywhere else.

The Ch'olan language has multiple loans from other languages, as usual, but one has special relevance: Nahuatl. What language the teotihuacanos spoke has been discussed in great detail, and there is no consensus- but several signs point to Nahuatl. Some Mayan spellings from the Early Classic point to the probable expression of terms in Nahuatl, known as *kakaw* that is controversial among specialists, as some think that it comes from the Mixe-

Zoque of the Olmecs and another that is Nahuatl (Macri and Looer 2003). What is unquestionable is the appearance of terms in Nahuatl in the Dresden Codex. On page 49, for example, in the document appears *xi-wi-te-I* intended to express *Xiu (i) tei*, or *Xiutecutli* which is literally a Nahuatl word for “lord of the plants”- a Mexica deity (ibid. : 287).

Maya texts, like all writing, reflect literary forms: personifications, allegories, hyperbole- about eleven were detected. For example, a common metaphor is the expression of death of rulers, even when death is referred to by its rival captors, who often use expressions like *ochha* ‘and *ochbi*’, which literally means “entered the water” and “entered the road” . Special mention goes to the diphasic unique literary figure of Mesoamerica consisting of two different words that appear together that constitute a third unit with metaphorical meaning: *kab* ‘*ch’e’n* literally “hollow earth” and actually used to express the concept ‘city’. For a long time it was thought that this figure was typical of the plateau and the Post classic period, but the Maya texts use evidence from the Classic period, demonstrating a deep-rooting in the minds of Mesoamerican peoples (Lacadena 2009).

In the Classic and Post Classic -250 to 900 then to 1,500 AD- there were other writing traditions in Mesoamerica: Teotihuacan, Zapotec, Mixtec, ñuiñes, to name a few. Unfortunately none have enough examples or bilingual texts, fundamental conditions to try to systematically study it and subsequently decrypt them. Work, for example, on Zapotec writing (Urcid 2001, 2005), despite resorting to various methods, failed to achieve a decipherment but interpreted some signs. Teotihuacan, a city of great importance during the Early Classic (250-600 A.D.), which had powerful rulers, is surprising for the few scriptural records or the lack of monuments or paintings relating to specific individuals. Its writing has been studied, despite not having a clear corpus and slow advancement (Taube 2000; Nielsen and Helmke, 2008 and 2011). Again, oral tradition prevailed over written tradition.

But is not the case of the Mexica and other Nahua, who left numerous texts glossed in Latin characters as we have said, and have recently allowed decipherment via reading of the signs in Nahua. The gloss was a direct translation and was almost always correct since the taking up of old ideas of the French Aubin (1849) in the nineteenth century by Alfonso Lacadena (2008b) and other epigraphists (Zender 2008) who have made considerable progress. They have questioned these developments, because unlike the Maya case, the Mexica texts are formed almost entirely of people’s names, place names and calendar dates, leaving no trace except for two or three examples of prayers. While observing what is achieved in the major examples there are clear rules and conventions of a defined and precise writing system no doubt. Very similar to Maya, using logograms and syllabograms surely not

copied from them but from traditions of the plateau, including some examples of repeated signs of vases from the Teotihuacan period from Las Colinas, in Tlaxcala with the Santa Codex Maria Asuncion 30v or page 86 of the History of the Chichimeca Toltec (Lacadena 2008b). But as we have often stressed, we must also consider that the civilizations of the Mexican plateau responded to a cultural tradition that favored orality before writing-without which they were thereby less relevant or transcendent.

In the Post Classic, the Maya civilization had collapsed. The southern lowlands were virtually depopulated and the population in Yucatan was dramatically reduced. There is no evidence that in those centuries large buildings were erected like in the Classic, or there were monuments carved with texts. The only scriptural evidence of the period are the ones that are in the three surviving Mayan codices: Dresden, Paris and Madrid, appointed and named after the cities where they currently lie. They are not considered authentic by Grolier after the UNAM practiced some physical studies. It is considered that they are copies made of older books of the Classic period, but made with signs from the Post classic and with the same artistic conventions which by then had changed. They are no small thing- these documents begin to reveal their written information as their characters have been deciphered with a little more difficulty, they have been worked over for the overwhelming mathematical and astronomical information, studied since the nineteenth century and continue to shed light on the enormous astral knowledge of the ancient Maya (Bricker and Bricker 2011; see also the special issue of April 2016 of *Archaeology Mexicana* on Dresden Codex).

Upon arrival of the Spaniards, it is reported by the friars of the destruction of numerous Mayan documents by the beliefs of the conquerors. In the late sixteenth and early seventeenth century, in the campaigns of extirpation of the Yucatan, 12 codices were confiscated, 11 were seized with Maya characters and 1 with Latin characters (Chuchiak 2010). This stresses that only one was from the coast of Campeche, where all the others were from the center and east of the Yucatan Peninsula.

For its part, in the highlands of Guatemala, where we know several dynasties migrated as evidenced by the genealogical records, there is virtually zero information on texts in classical Mayan signs, with all texts about history and Mayan genealogy appearing in Latin characters.

Thus, a long and rich Mayan scriptural tradition perished that had flourished for two thousand years.

—FIGURES—

Figure 1. Writing example, in case logograma phonograms lowercase.
Ya-AL-la-K’UH-IXIK, yal k’uh Ixix, “His son of the Holy Lady”.

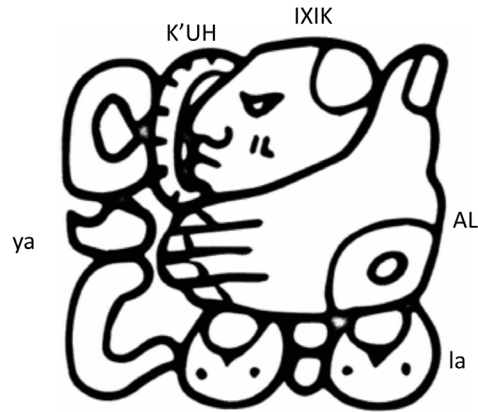
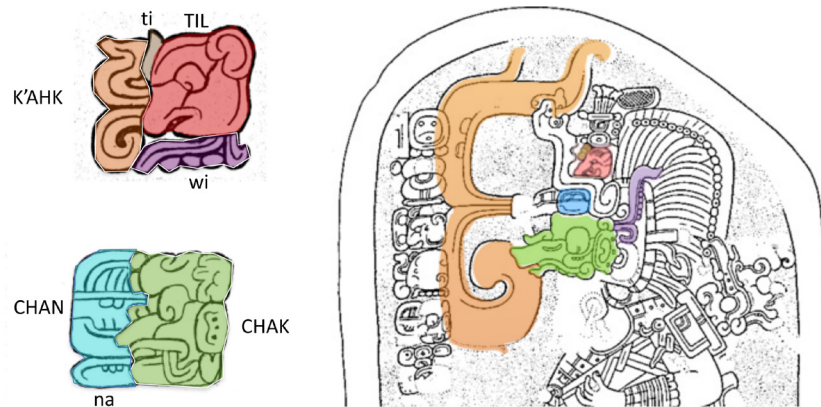


Figure 2. Example name is placed in the headdress Ruler: a) K’AHK-ti-TIL-wi CHAK CHAN-na, K’ahk Tiliw Chan Chahk, “God of Thunder Fire Burning Heaven”; Drawn from side Naranjo Stela 22; b) K’AHK-ti-TIL-wi CHAN CHAK-note the absence of the national *úilaba*, K’ahk Tiliw Chan Chahk, “God of Thunder Fire Burning Heaven”; Stela 22 front. Linda Schele Drawing, FAMSI.



Stela 22 Naranjo. Linda Schele drawing.

The Linda Schele Drawings Collection, 2000 © David Scheme.

Figure 3. Example writing variants as full body. Palenque Palace Tablet.
Redrawn by Jose Francisco Gutierrez, from Linda Schele.



Figure 4. Example phonetic complementation: waaj “Tamal”; tuun
“stone”. Drawn by José Francisco Gutiérrez,
from Alfonso Lacadena (2010).

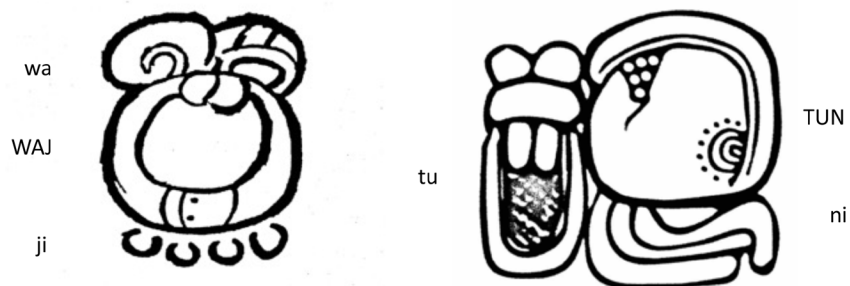


Figure 5. Example of auxiliary signs: ka-kawa, kakaw “cocoa”; tz’u-nu-nu, tz’unu’n “Hummingbird”. Redrawn by Jose Francisco Gutierrez, from Alfonso Lacadena (2010).



Figure 6. Example simplification or overlapping signs, syllables: hi and pi. Redrawn by Jose Francisco Gutierrez, from Alfonso Lacadena (2010).

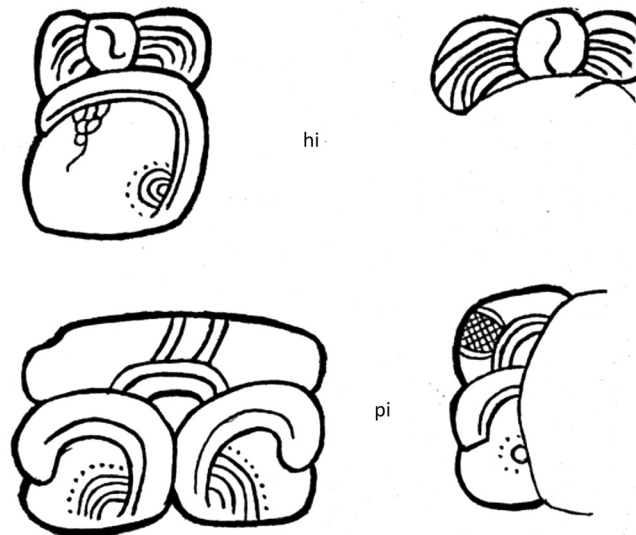


Figure 7. Example of setting signs: winal-la, w al, “month, man.”
Redrawn by Jose Francisco Gutierrez, from Alfonso Lacadena (2010).

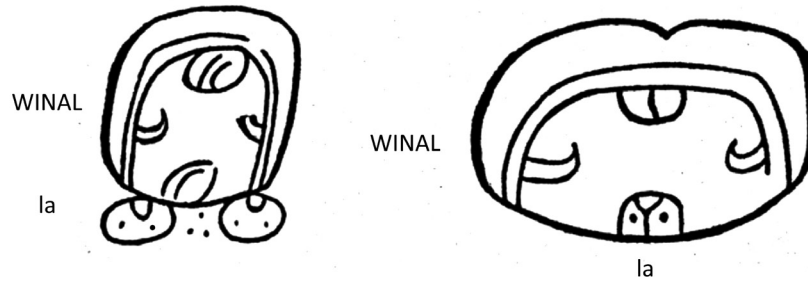


Figure 8. Example combination or merger of signs: KIN-ni-chi, kíh nich,
“bravo” -the title of rulers. Redrawn by Jose Francisco
Gutierrez, from an example of Alfonso Lacadena.

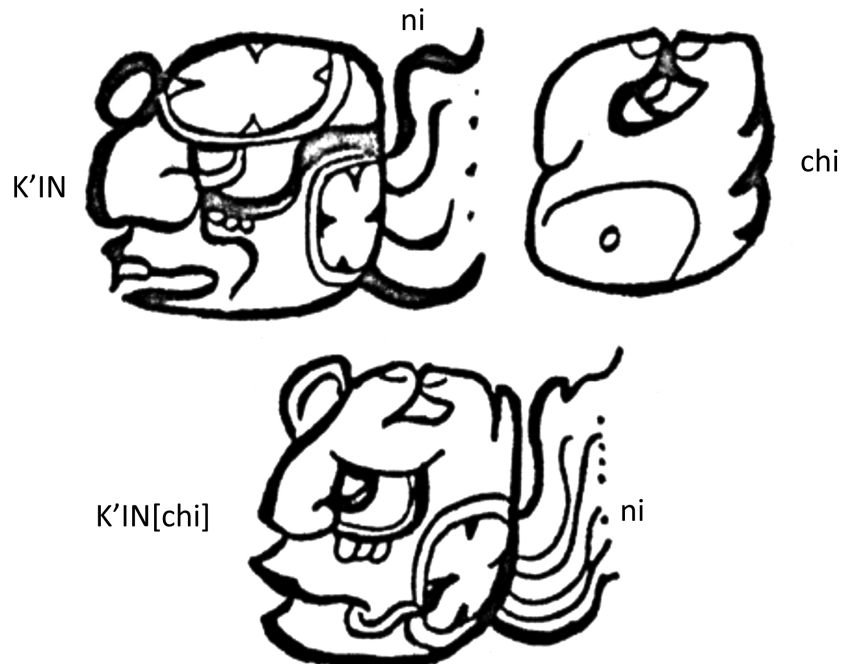


Figure 9. Likely bilingual writing teotihuacanos left and right Maya signs. 26. Temple Copan Redrawn by Mariana Blanco Alcantara from Stuart (2005b).



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Living art in the weavings of Venustiano Carranza, Chiapas

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ABSTRACT

This article presents some interpretations about the textile art of the municipality of Venustiano Carranza, Chiapas, as a way of approaching the cultural richness that make up tissues and typical embroidery of this place. Textile art of the indigenous peoples expressed their cultural identity and is an activity that is part of its tradition. Decoding the secret that saved forms and symbols represented in the tissues implies an understanding of ancient history in its relation to the modern. Textile art is creative and that creativity is expressed from the first generations of native peoples and responds to mythical beliefs, which have been transmitted in family and community socialization processes. In the case of the inhabitants of Venustiano Carranza, that learning is evident from an early age, when girls begin to capture different motives on the fabrics and embroideries, usually with clear allusions to nature. Reminiscences of maya origin are making the dress of the inhabitants of this municipality, since each part integrates elements of that great culture through a combination of yarns, colors, shapes and symbols. This last allows understand that making a handmade product, as typical costumes, goes beyond the needs of dress; It represents the creativity and the permanence of meanings that give form to the cultural identity of this village.

Keywords: crafts, tissues, art, culture, traditions, identity.

HANDHANDCRAFTS, A LIVING CULTURE

Handhandcrafts are studied by anthropologists, historians and many who admire culture in its various manifestations and are interested in understanding the symbols present in handcrafted products. In this paper we present the analysis of weavings of Venustiano Carranza, a village consisting of Tzotzil Indians, whose handcrafts express their identity.

We consider it necessary to note some definitions of handhandcrafts and their characteristics such as being indigenous, traditional folk and contemporary, which combine a number of creative manifestations. They represent the identity of peoples and are based on a way of seeing and interpreting the world. Handcrafts, according to Fernandez (2003), can be defined as a productive and creative activity of a plastic, manual and traditional inspired character, with a design, manufacture and serial planning embodied in objects, works or pieces that respond to a need or everyday functional, decorative, magical, or religious use with an aesthetic or decorative quality necessarily present as an ingredient. They are manufactured in a small domestic or professional workshop, without outsourced processes; by manual and non - manual but noble, genuine and personal control by the artisans' techniques, whose production is intended for a restricted and reduced market, fairs, or commercial sales which are known by the artisan.

Artisanal products have different meanings depending on the people who produce them. They are an expression of man's creativity, his sensitivity and imagination to convert simple inert materials into works of art or items and utensils that will make your life and that of others less difficult. Angelotti (2004), citing Euan, Burgos and others, notes that handcrafts are handmade objects, made by people from the interior, peasants and indigenous people, follow a tradition and are produced mostly by ethnic groups that represent a culture. These objects are bearers of a historical, cultural, utilitarian or aesthetic value, that meet socially recognized function, made by craftsman, individually or collectively, using simple techniques.

Handcraft production does not produce identical units as in industrial production. Each handcrafter, in each product, used their creativity to make it different. Where you want to make several identical objects, it will be difficult to achieve. The craft can be seen as imperfect or defective art, for the lack of uniformity in the development of products. Each craft product reveals the individuality of the craftsman, although some of his creations present coincidences, so that many of the artisans tend to employ a kind of signature to these creations, bringing as a consequence that these will stop being anonymous. Regarding handcrafts, UNESCO (2015) states that they are "are made by artisans, either completely by hand or with the help of hand

tools or even mechanical means, as long as the direct manual contribution of the artisan remains the most important component of the finished product “(Artesanía y Diseño, paragraph 2).

In this context it is possible to define some types of crafts that, while they may be qualified based on several factors, maintaining a common denominator: the manual work of a craftsman. In first place we can speak of indigenous handicrafts, which is defined as the production of useful, rituals and aesthetic goods, conditioned directly by the physical and social environment that constitutes the material expression of the culture of communities with ethnic unity and which are relatively closed . This craft is done to satisfy social needs, which are integrated as a practical activity, the concepts of art and functionality and community awareness about the potential of each resource of the geographical environment, transmitted knowledge materializes directly through generations (Naranjo, Brown, Jimenez and Echavarría, 2005). These handicrafts show an interesting hybrid between a tradition charged with symbolic, mythological meanings and a new tradition in harmony with aesthetic values inculcated by contact with the creole culture. According to the Law for the Promotion of Indigenous Handicrafts of Baja California (2001), indigenous craft is defined as:

A good that artisans produce individually or collectively and for their technical or symbolic, religious or cultural elements of an ethnic nature, has a cultural, utilitarian or aesthetic value. Handicrafts can be traditional or newly invented and developed manually or using instruments, tools or machinery (p. 2).

Indian handicrafts are recognized as the livelihoods of many communities struggling to assert their identity through imaginative talent of its artisans. In some cases they even constitute the main source of economy. This is why people should understand that by acquiring an indigenous craft they not only carry home a souvenir, but a small part of the identity of the state or place where the product was purchased and, above all, contribute to an economic activity necessary for survival . Finally, it can be said that when speaking of indigenous handicrafts they can be referred to the set of items that identify and differentiate one from another ethnic community and that, through these assets one can learn about the customs and traditions of each location.

Another expression of cultural value are the traditional folk handicrafts. This type of craft, according to Cando (2012), can be considered as:

It is a historical process of collective creation, which has as a primary motive a creative activity that constitutes a social need. Its realization as

a work tends to reflect an empirical consciousness of cultural property; its essence is considered as the bearer of the popular tradition. Stability or variability of the creative process depends on the popular tradition itself and the extra-traditional processes that influence the activity (p. 96).

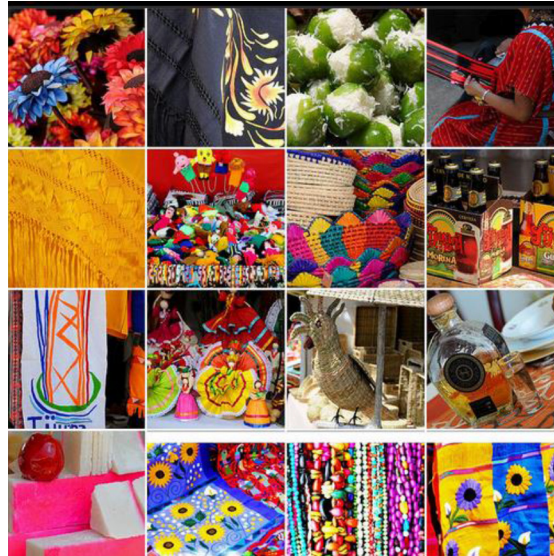


Figure 1. Indigenous Handcrafts
Source: Buelna, 2006

Traditional handcrafts, before being an object for the market, is an object that serves as support for the preservation and transmission of memory. It is one of many points of crystallization of a collective imagination. It is said by her that is dominantly anonymous “is done more in series and depends mainly on the manual skill rather than creative imagination” (Bartra, 2005, p. 17).

Another type of handcrafts is so called *contemporary* crafts. According to Dávila (2012), contemporary crafts are “producing useful and aesthetic objects within the framework of the trades and which process technical elements from other cultural contexts that are synchronized and has a characteristic of transition to modern technology” (p . 28). That is, this type of craft is based on the production of handcrafts that has its roots in traditional craftsmanship but has been transformed to fit the existing trends and new needs, keeping features of their national identity and orientation towards application of aesthetic principles of universal or academic trends.

THE ART OF TEXTILES

In the municipality of Venustiano Carranza, Chiapas, craftswomen express their identity and represent their culture through their weaving and embroidery. From the period of colonization to the present day, their weavings are covered with Mayan motifs. The designs are geometric abstractions or have naturalistic forms, depending on the technique in which they are made. The creativity of the artisans is evident in the attractive and bold color combinations for fabrics and embroidery. According to the Center for Textiles of the Mayan World (2013):

Among the geometric Mayan motifs, there are included diamonds, stars, lightning and zigzag lines; among phytomorphs: corn plants or flowers. We also find zoomorphic designs, such as birds, frogs, monkeys, scorpions and butterflies, or anthropomorphic patterns of saints. Some of these elements have been preserved in the weavings from pre - Hispanic times and have been passed down from generation to generation. Each creator imbues these reasons their own ideas, their perceptions, sensitivity and aesthetic sense. Also, they can stick to tradition or innovate it.

The textile art of Venustiano Carranza is a transition from the maya to modern, so craftswomen create designs that refer to a worldview rooted in its historical past. Thus women choose forms, shapes or colors of threads and embody their creative images, taking into account their traditions and customs.

The fabric is an expression that can recognize the particular style of the place. Craftswomen of Venustiano Carranza strive to excel and compete with other municipalities in the highlands of Chiapas, making a difference with their style, patterns, colors, cotton and embroidery. Craftswomenn have demonstrated the living art of culture in national and international events, where it has been recognized beauty of the weavings that form a kind of language to express their place of origin.

Craftswomen begin at an early age in textile art, when they access the tradition and begin to become familiar with the techniques and tools needed for the job. The techniques used in textile art are varied, however most it specializes in the backstrap loom, which is so named because the woven interlaced yarn is made with the body of the weaver; that is, the woman uses the strength of her hands and with the rest of her body pulls the loom backwards from the waist, which is hung from the other end from either from the ceiling, wall or a tree. The loom is made of wood, string, rows of string

and yarn . Craftswomen engaged only in embroidery use threads, rows, yarn, fabric manufacturing and darning needle.

The forms and figures that are reproduced in the looms are seen in shirts, blouses, skirts, handkerchiefs, napkins, rugs, belts, and scarves among other objects. The products are sold within the village without intermediaries and a fraction is sold in San Cristobal de las Casas, Chiapas. The largest sales of textiles are seen in December.

TEXTILE ART, DESIGN AND CULTURE

The designs in textile art of Venustiano Carranza refer to their Mayan origin and express a way of seeing the world. The creativity of craftswomen shows spontaneity in their attractive combinations of embroidery, which is a reason for the appreciation of their textiles as works of art. To learn more about these designs, in the following paragraphs traditional textile clothing for both men and women are described.

Menswear

Morales (2005) in his monograph essay explains that the typical garb for men in Venustiano Carranza is a short white shirt with an upturned neck 15 centimeters in front; long straight sleeves, to the wrist, without any bends or cuffs, with ornamental fabrics and a pocket on the upper left front of the chest which is considered as a new design. The shirt can be embroidered with colored yarn, mainly red. This shirt is sometimes so short that it exposes a bare belly; it does not go into pants and many of them end with a small fringe.

The pants are wide and gathered at the waist, making a diagonal cut that is reduced the bottom, near the ankle, and thus forms an attractive set of pleats. These pleats are diagonal from outside to inside and from the top down. The inseam of the legs have ornaments isolated in white thread or yarn, making the pants seem mottled. The yarn is red on the pants, with purple welts distributed in several transverse rows, giving a whole Moorish style. The clothing design for males (Figure 2) includes typical clothing used in Classic Maya period figures, which can be seen carved into ancient steles, like the mural of Bonampak. Similar designs are also in the lintels of Yaxchilan 24 and 26.



Figure 2. Traditional men's clothing.

Fuente: Albores, 2014.

Women's clothing

Designs in female outfits make up the strength woven into protecting their cultural identity. The outfits are colorful and differ from those made in other parts of the state by the various figures they contain: butterflies, stars, rattlesnake tails, toads (symbol of rain and earth) of the ancient gods of the sun and the moon, buzzards, eagles, men and women, flowers and corn plants.



Figure 3. Traditional outfit

Source: Albores, 2014

The blouse is short and white with a wide neckline. It has a square neckline with a wide ribbon, and is known as a “huipil”. This garment is woven

and embroidered in total white or in bright colors of a single background. On the shoulder there is wide, thick embroidery.

The skirt is a long sheet of about three meters, divided into two pieces of fabric of about a meter and a half each, joined by an embroidered stitching forming a motif of between five and ten centimeters wide. The skirt is indigo blue with colored embroidery. The female outfit is complete with a hair weaving that women make in their thick braids, into which is woven a ribbon in the same way that a belt is woven, and which is embroidered and has elegant embroidery in the center (Lopez, 2013).

CLOTHING AS DISTINCTION

The diversity of dress and their importance in social practices allows us to understand their cultural significance. Those with a civil or religious office have the name of “principals”; They are heads of districts or indigenous chiefs and used the traditional men’s clothing , described above, which is more showy or colorful. On their backs, in the style of a royal cape, they wear a red cloth the measures more than a square meter and which form diagonal folds. The cloth is woven with a special thread called “thread of Arabia” and in it abounds various embroidery with brightly colored figures. (Figure 4).

The outfit used by the principals is prepared by their wives and is a vestige of ancient pre - Hispanic weavings- Mayan heritage that lingers and is retained by indigenous weaving with great art and skill. The costumes are made with fine fabrics found in the state (Lopez, 2013).



Figure 4. Attire of a civil position

Source: Albores, 2014

Another example of attire are the “krincipales” which are used by the chiefs or directors (caciques) of the neighborhood or group. These include a linen handkerchief, with a red background, which is a little more than one square meter, embroidered with figures that are completely connected made of yarns of different colors. Sometimes the handkerchief, which is made up of various diagonal bends that form a band which is wound around the head. In other words, it covers the forehead with the center and with its tips knotted or simply locked or linked in back of the head.

The tips fall towards the back and the tip or corner of the center is on the front, giving the appearance of a Moorish turban.

The chiefs or caciques use a red and embroidered waistband, which operates only as an ornament, since the true fastening for the pants, which lacks buttons or snaps, is a short, thin thread that emerges from the pants. They wear straw hats, which before had a low crown and wide brim, but today have a high crown and large brim, into which they also weave in braids then sew them together without using forms, molds or machines.

Some designs combine signs of the Maya worldview with the Spanish culture; for example, *carrerantes*, riders dressed in a typical costume, use a showy red Spanish style shirt with openings at the angle, complimented with tight white trousers. The jacket that goes over the white shirt has black bars on the sleeves and back. It is open to the front and has a neck and a small handkerchief behind and short small openings below the waist with colored edges. On the neck is worn a waistband loomed cloth with red cotton thread. They carry another blanket embroidered with red on the head with a background adorned with different colors, such as yellow, green, blue or purple (Figure 5).



Figure 5. carrerante outfit.

Source: Albores, 2014.

The traditional clothing of Venustiano Carranza maintains a close relationship not only with the political hierarchy of its inhabitants, but also with other characteristics, such as marital status. In the case of women, the attire of a single woman is a *huipil* with plenty of drawings and a variety of colors. They wear different colored blouses but the main color is white, symbolizing purity and virginity. This is why brides wear clothes in that color. Married women also use white in the *huipil*, but sometimes it is replaced by a cream or beige, with fewer patterns and colors (Morales, 2005).

The clothing also identifies an adult or elderly person. The main feature is the reduced presence of drawings, shapes or figures in both the *huipil* and in the petticoat in the case of women, and the pants and shirt in the case of men (Figure 6). The variety of designs, colors and components, is evidence to the development of the clothing as a collective expression and that the patterns created by the people themselves are followed, demonstrating its tradition and custom.

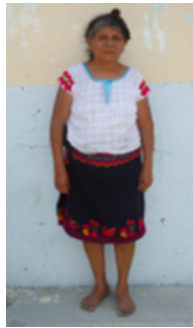


Figure 6. Traditional outfit of an adult woman

Source: Albores, 2014

SHAPES AND FIGURES IN WEAVINGS

The shapes and figures in weavings represent the living culture of the people and ethnic groups- they reveal beliefs and the original magic of their specific identity. In the case of the weavings of Venustiano Carranza, art and fabric intertwine to express the symbolism of its history. The weavings of this municipality are a rich, complex and beautiful language that has allowed the people to preserve their creative knowledge.

The skilled hands of its weavers not only reproduce their beautiful designs, but also express their feelings and stories through symbols.

Morris (2006) explains that weavers recognize the antiquity and sanctity of the weavings' reasons but are reluctant to talk about their meaning. The same pattern can have more than four names and each reflects a different perspective. Only a few weavers know how to name them correctly, not only describe the motif.

In the culture of the Tzotzil people the craft of spinning and weaving is an explanatory principle of the environment in which they live which reveals their beliefs and meanings. Calvo (1998) indicates the meaning and description of several drawings or figures found in the weavings of the municipality of Venustiano Carranza, which are presented below.

Spiny star (Ch'ix k'anal)

This drawing represents the biggest star that appears in the east of the town which guides farmers when to plant the corn.



Figure 7. Star (Ch'ix k'anal)

Source: Albores, 2014

Rings or diamonds (Ch'okobil)

This drawing is shown on shirts and trousers, embroidered with red, green, yellow and purple yarn. This design is used by people for major holidays.



Figure 8. Rings or diamonds (Ch'okobil)

Source: Albores, 2014

Kapok tree (Yaxte ')

This drawing refers to the men who work planting the corn. The embroidery of this drawing is made with red, green, purple and yellow threads to make shirts that senior citizens use on religious holidays.

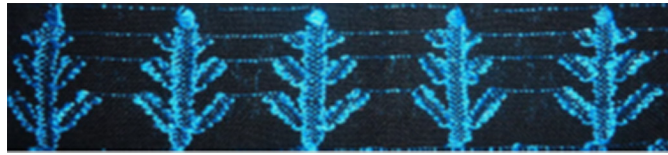


Figure 9. Kapok tree (Yaxte ') (1)



Figure 10. Kapok tree (2)



Figure 11. Kapok tree (3)

Source: Albores, 2014

The variety of shapes with aesthetic standards created by the people entails different meanings that relate to everyday social practices of the inhabitants of Venustiano Carranza and which constitutes their cultural identity. The various meanings, while still keeping its essential features through generations, are subject to interpretations from the processes of appropriation and socialization within the family and as part of the larger group. These meanings, which are expressed in different weavings, allow interactions with the living culture of the people of Venustiano Carranza. Fabrics made with soft textures and intense hues contain codes that tell stories that transcend the present and promise to perpetuate through the hands of craftswomen.

SPATIAL DELIMITATION

This investigation was conducted in the municipality of Venustiano Carranza, Chiapas, which is located in the Central Depression region with mountainous and semi flat terrain, located at the geographical coordinates 16 ° 21 ‘N and 92 ° 34 ‘W. It has a population of 61.341. It is bordered on the north by Totolapa, Nicolas Ruiz and Teopisca, with Amatenango Valley to the northeast , east of Las Rosas and Socoltenango, south of La Concordia, to the west with Villa Corzo and Chiapa de Corzo, and to the northwest of Acalá. It has a land area of 1396.1 square kilometers.



Image 1. Geographic location of the municipality of Venustiano Carranza, Chiapas.

Source: Recovered from <http://chiapas.gob.mx>

It has a warm humid climate with summer rains. In relation to the Grijalva River hydrography , its most important feature is forming part of the reservoir of the Belisario Dominguez dam, known as La Angostura. Among its tributaries include the Blanco and San Vicente rivers and the Siquilhó (Cold Water), Agua Zarca, Pisholtón (stone hat) streams.

TEMPORAL DELIMITATION

In the postmodernist context traditions, culture of the people through their clothes and meanings, currently living art appreciation in the weavings are representative of identity of its inhabitants it stands. It is noteworthy that this research processes developed in the municipal capital of Venustiano Carranza, Chiapas, with the temporality of 4 months for field research.

CONCLUSIONS

This article has generally described some types of handicrafts: indigenous, popular traditional and contemporary, which demonstrate the creativity, sensitivity and imagination of artisans and in the first two cases, represent a culture with ancient roots. The latter is essential to understand the textile art of Venustiano Carranza, which is made up of woven and embroidered textiles with figures of different colors and attractive combinations prepared by craftswomen in accordance with a tradition that has been passed from generation to generation.

The designs of the weavings of Venustiano Carranza are evidence of its relationship to its culture which is expressed through motifs and colors and which make the relationship of clothing with social practices understood. Based on the above, it can be said that the outfits are used to differentiate the social classes within the indigenous group, marital status or age, since these distinctions are also expressed in the different symbols, colors or designs used in the manufacture of various garments. Finally, it can be said that the forms and figures follow aesthetic patterns in different embroideries which reveal beliefs and important meanings in the lives of the people, and contribute in maintaining the essential features of their cultural identity and its maintenance as an indigenous people.

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The sacred dimension among the tojolabal

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ABSTRACT

This article is a field research conducted from Tojolabal communities living with the municipality of Las Margaritas, Chiapas. In that it presents spirituality and sacredness from indigenous peoples manifests and is experienced in time and space lived in the divinity and the life of the subjects are developed and projected on a day to day, it is therefore a interrelation with the universe. Thus, among the Tojolabal the sacred dimension is lived in a characteristic and particularly the implications are strongly present in everyday life, for spirituality and the sacred allows the balance between the forces that populate the universe, that is, is life itself that is at stake. So, one way to maintain stable relations with earthly and unearthly multiple identities is through the visit and worship at various places and spaces that the population identifies itself as sacred. Hence, caves, springs, mountains, salt mines, archaeological sites or animals associated with the divine, as spaces become important repositories of historical memory of the people and as a cultural reference of past generations. Therefore, the sacred dimension linked to indigenous territoriality, is in correspondence to the ancestral and symbolic boundary that subjects confer upon that sacred territory and the dynamics of meaning that give the universe of real or symbolic. Hence symbols play a role in the interaction between humans and the universe.

Keywords: Religious, sacred, ritual, territory, caves, tojolabales.

THE SACRED DIMENSION AMONG THE INDIGENOUS PEOPLES

Spirituality and the sacred of the indigenous peoples manifests and lives in time and in everyday space, in which the divinity and the life of the subjects are developed and projected on a daily basis. It is an interrelation with the universe, the cosmos, in which “*everything* interacts and therefore everything has a certain standard of living and *spirit*” (Boff, 1996: 60). However, in these *turbulent times*, understanding the world is no longer a matter of being in tune with the cosmos. The world became what it is for the citizens of the modern world- a de spiritualized mechanism that can be grasped by concepts and representations constructed through reason.

Thus, in “these successive separations¹ are articulated with those that underlie the essential contrast that is established from the colonial formation of the world between Western or European (conceived as modern, advanced) and the “ other “ the rest of the people and culture of the world “(Lander, 2000: 249), i.e., from such coloniality of the sacred as a reading of the entire time and space of human experience starting from this peculiarity, there is built a radically exclusive universality which various indigenous peoples are facing, ie, those who have been conceived as the Others.

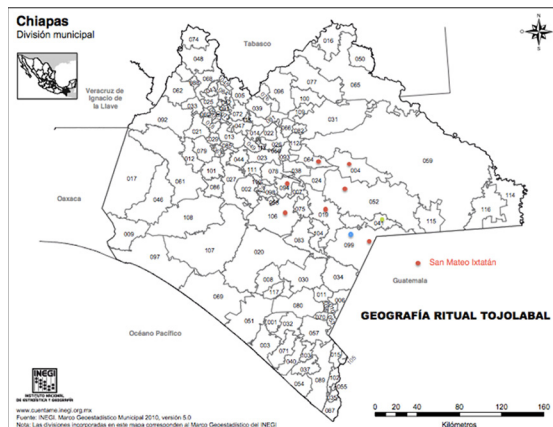
Among these “Others” are the Tojolabal, one of 12 indigenous peoples living in the territory of Chiapas, especially those in the border region of the state. Although its origins have become somewhat uncertain for scholars, this is not the case for them, because since pre - Columbian times they have maintained a relationship with his old friends- the Chuj Guatemalans.

The Tojolabal people have gone through a series of socio - historical processes that have led to maintaining a territorial re-configuration constant from multiple processes of colonization, which in some cases, and for social disintegration on the other, thus in the XXI century territoriality begins to become more visible in terms of position in social spaces that for more than a century were considered Ladino or *kaxlanes* , as in the case of municipal

1 It is interesting to emphasize that such separations or partitions of the world and of the cosmo-experiences has to do with a closed, hegemonic and colonizing system, as mentioned by Leonardo Boff “ *the division between biotic and abiotic, living and nonliving things, obeys another conception of reality, valid only for a closed system of apparently conscious and permanent beings, like stars, mountains and physical bodies that are opposed to complex, dynamic and alive beings. There is the justification. But if we break that barrier and draw back the veil of relationships and interactions that are underlying all of them, we realize that consistency and permanence evaporate. We find an open, not closed system. All beings are also at the mercy of the inter-tretro-relationships, the energies and fields* “ (1996: 61).

capitals like Las Margaritas, Comitán and Altamirano starting from the armed conflict 1994. From there we can find Tojolabal population centers in the municipalities of Las Margaritas, Altamirano, Comitán, Independencia, La Trinitaria and recently Maravilla Tenejapa.

Therefore, speaking of the sacred refers to the sacred that postulates human existence in its multiplicity of cultural forms, translated into prayers to the hills, springs, caves, in pilgrimages, materializing in a relationship of respect and harmony with mother earth and Mother Nature.



Map 1. Territories that make up the Geography Ritual Tojolabal.

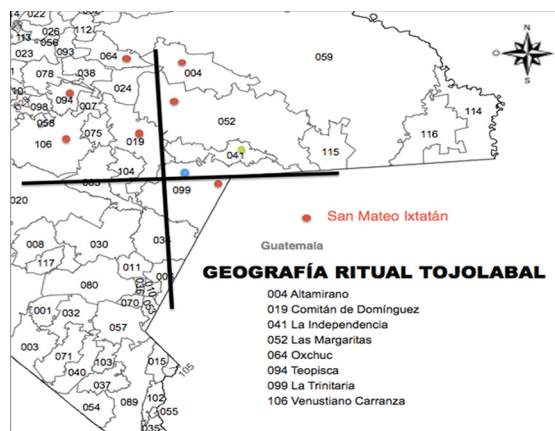
Source: authors.

Thus the concepts of space and sacred territory are based and give sustenance to the essence of indigenous thought, since the sacred space has the effect of highlighting an area of the surrounding cosmic environment and make it different (Eliade, 1957). That is, space and time are configured in such a way that allows us to understand that the epistemic textile that is constructed precisely to recognize the spaces which are collectively recognized and are also a sacred intentionality linked to the temporal dynamics that have been established from the experience of previous generations and which generates sense in daily work.

Therefore, the sacred dimension between Tojolabales can be experienced in many ways and expressions, since the relationship expressed with divinity can be done from prayer and visiting the cornfields, prayers in the chapel, participation as a standard bearer, drummer, rocketeer, *rezador* or pilgrim to waterholes, hills or caves to which he has taken some gift as part of the sacred dimension. While the panorama of the sacred dimension is broad, in this article we aim to approach this dimension from a first proposal of Tojolabal ritual geography and configuration of spaces and sacred deities for

this contemporary Mayan people. From this, the Tojolabal ritual geography is presented and linked to places and sites considered sacred among Tojolabales.

In an effort to locate the different territories where Tojolabales maintain relations of ritualism and coexistence, we can propose the following ritual geography from several municipalities that are part of the border state of Chiapas.



Map 2. Municipalities that make up the Tojolabal Ritual Geography .

Source: authors.

We found that Tojolabales maintain ritual relations with other cultures in the region, with at least three contemporary Mayan villages, including Tseltales such as in the case of Oxchuc; Tsotsiles in Venustiano Carranza and Chujes in San Mateo Ixtatán in Guatemala. Among the multiplicity of spaces and places considered sacred in Ritual Tojolabal Geography that are presented here include: hills, caves, salt mines and archaeological sites. Likewise, the sacred precincts of patron saints which are important for Tojolabales are visited.

The first visit that is performed is for the ritual cycle *k'u'anel*² and is located northwest of the ritual geography that has been presented, is the visit to St. Caralampio in Comitán de Domínguez. The devotion of this patron saint of the city is linked to protection against pests and diseases that afflicted the population at some time. Subsequently, the second visit acquires a substantial importance among the Tojolabales and is made to San Mateo Ixtatán in the neighboring country of Guatemala. This pilgrimage has a sense and

² The Spanish translation of *k'u'anel* is "the pilgrimage".

symbolic meaning for Tojolabales because they come back to their center of origin in Guatemala according to oral tradition. Hypothetically it is reported that following a dispute over the salt mines that exist in San Mateo, Chujes Mateanos and Tojolabales held a “fight”, which led the latter being somehow gradually expelled from Chuj Guatemalan territory and began to form the first Tojolabal settlements in the lake region of the Comitescan valleys.

Throughout the pilgrimage in San Mateo Ixtatán, the Tojolabales perform a series of visits to places considered sacred and of historical importance—in other words, the places that form part of the historical memory of this town. So, the first site to be visited is the salt mines, a place of great symbolic and historic meaning for this people in addition to being a prehispanic shrine. Immediately afterwards there is a visit to the archaeological site called *Wajxaklajunhe* (Temple 18) which is a sacred place and linked as a space in which Tojolabales and other nearby groups coexisted for some time (Mateanos, Chujes, Coatanecos and probably Q’anjobales) is made. All of this pilgrimage undoubtedly allows an approach to the worldview of these people and for interethnic relationships established with Guatemalan groups, particularly the Chuj.

Moreover, in the month of April the next ritual site that is visited by the Tojolabales is the municipality Oxchuc, whose presence mainly of Tseltales becomes a space of building relations between these two peoples. In this process of cross-cultural re-understanding, there are visits to the holy places as in the case of the hill where according to oral tradition appeared the patron saint, St. Thomas.

In this ritual geography, the presence of Tojolabales with Tsotsil neighbors of Venustiano Carranza is also present from the pilgrimage or procession in honor of San Bartolo who is believed to be the caretaker of the heart of basic seeds, hence the importance of going to visit this holy and principal hill as part of the ritual Tojolabal geography.

Moreover, the visit that the Tojol Winik-ixukotik made to the Eternal Father in the municipality of La Trinitaria, shows the relationships established by Tojolabal pilgrims with Tseltales *rezadores* of this municipality and the mestizo population, where they have created alliances and recognition of both groups. As for Tojolabales, the *Zapalutas* or *rezadores* of La Trinitaria are those who know the ritual language in order to carry out the petitions to patron saints such as the Eternal Father or Saint Matthew, for it is in this ritual language that requests for rain, abundant harvests and prosperity for families are made, gaining meaning in their sacred dimension.

The municipality of Altamirano and Las Margaritas are two territorial areas where the Tojolabal pilgrims walk to venerate Saint Charles and Saint Margaret of Antioch respectively. Without doubt, both populations

of Tojolabal descent are part of this ritual geography that have charted Tojolabal people by generations, with the intention of making clear its sacred dimension through primarily the sense of agricultural rituals.

THE CULT OF THE CAVES AS SACRED SPACES

The cult of the caves considered sacred spaces remained widespread as a cultural understanding between Mesoamerican peoples, and has continued even today in many contemporary indigenous peoples. Therefore, the “mountain and cave are an important factor in the Mesoamerican hydraulic worldview. The temple itself was regarded as a sacred hill covering groundwater that manifests through bodies of water and springs in the caves. The relationship that links Tlaloc with caves and hills is personified by Tepeyollotl, the heart of the hill, a jaguar deity personified that summarizes the pre - classical aspects of the cave, rainforest, and land “(Montero, 2004: 27).

Here is a sample of the embodiment of Tepeyollotl in the Borgia Codex.



Image 1. Representation of Tepeyollotl in the Borgia Codex.

Figure taken by Montero, 2004.

Now, our intention is to approach the sacred dimension among the Tojolabales from spaces and territories considered sacred, which leads us to understand that according to the Mesoamerican tradition “the universe is composed of different time-spaces and for two kinds of substances. Both time and space are coexistent; but one of them-the divine-was-is cause of the other- the mundane- and will continue to exist after its disappearance. The two substances are different for the first being fine, subtle, and indestructible; the second heavy, dense and perishable”(Lopez, 2012: 3).

The sacred dimension linked to the indigenous territoriality is in correspondence with the ancestral and symbolic boundaries that subjects confer upon that sacred territory and the dynamics of meaning that they give the universe in a real or symbolic way. Hence the symbols play an important role in the interaction between the universe and human beings, which is manifested practically in the worship of places considered sacred such as mountains, caves, grottos, springs, lakes, ponds, stones, archaeological sites or Catholic saints.

In this interactive process between the earthly and the unearthly, the symbolic relations that ritualism conduce as a petition process in some cases and are “paid” in others for the benefits that are received. Hence, these relationships are interwoven between sacred sites and rituals which are performed by the subjects, and constitute the necessary correspondence between the cosmos and life itself.

It is also true that “since Europe invaded american territory, indigenous peoples have defended their ancestral lands through the law of origin, in which the territory is part of a sacred geography, where the world order is saved by an operational series of rituals “(Zapata, s / f: 1), hence the importance of sacred sites focus on maintaining the balance of forces and energies that populate life and the actions and reactions that subjects have in their territory.

Therefore, against this perspective:

“Sacred sites should not be viewed as specific geographical points, but as the expressive dimension of a form of cultural understanding and relationship with nature. These are areas that concentrate power in the history of this relationship: both the past and the present and even the future as desire and vindication. They are places, then, where knowledge and learning, dialogue and encounter, revelation and confession, offering and promise, pilgrimage and lodging; are enclosures for prayer, contemplation, reverence and humility” (Lemon et al, 2015: 8).

Caves and hills are considered sacred spaces for multiple indigenous peoples in Mexican territory, thus the Tojolabal consider these spaces as repositories where the heart (*k’ujol*) or soul (*altsil*) of the main seeds that make up the basic food of this contemporary Mayan people is kept stored. Thus we have the caves which are the hearts of the corn (*ixim*), beans (*Chenek*), pumpkin (*k’um*), chile (*ich*) and *tsilacayote* (*mayil*), and it is conceived as well as the home where a metaphysical and symbolic entity that has the status of a deity among the people of this town, i.e. lightning or *chawuk*, dwells.

Lightening, as an unearthly entity, is present in many Mesoamerican peoples. An example is the Tseltales of Petalcingo who “report that St. Francis of Assisi is called *Ktatik*, in Tzeltal language means” Father protector of the

goods that his children consume. Within his being are *naguales*, with one of them being the lightning bolt “(Oseguera and Sanchez, 2011: 23).

In other words, from these reflections the lightning bolt (*chawuk*) from the Tojolabal perspective would be the personification of the old Chaak which is considered as the “God of ... water, thunder and lightning” (Barrera, 1980: 77).

Therefore, as Bassie and Hopkins state “In Chol and other Mayan Languages, the concepts of thunder , sheet lightning , and lightning bolts are interrelated and sometimes used interchangeably. This overlap in usage and meaning derives from the common origin of all these phenomena: the deity Known as Chajk in Ch’ol and as Chahk in the Classic Period. Chahk has been loaned to Yucatec Maya as Chaak “(2015: 123) and therefore the classic Chahk might still be in keeping with Chawuk³ (lightning bolt) Tojolabal in the XXI century, hence the importance that this entity has kept among the Tojolabal as a major element in the sacred dimension of these people.

The *chawuk*, then, is seen as the guardian of the caves and main promoter of rain and fertility. The lightning bolt has its representation in both a physical entity as in metaphysics, first occurring through individuals who have acquired the gift or whose *wayjelal* or nahual is lightning. However, it is not an easy task. Not just anyone can access such a responsibility since the lightning bolt is a kind of intercessor with the deities for both the request for enough rain to moderating them if they are exceeded.

Faced with this need for requests for enough rain and good harvests of food commodities, corn and beans, the Tojolabal people have been characterized as avid organizers of processions or pilgrimages known in the Tojol-ab’al language as *k’u’anel*, understood as propitiatory rituals of the search for a good agricultural season. Even though it is a ritual with great agricultural sense, it should be noted that within the requests made by the principal or ritual specialist, there can be found the welfare of families and communities that are involved, domestic animals and the preservation of the sites identified as sacred, particularly the springs, waterholes, caves and mountains.

Given this ritual process, it should be noted that every place you visit on a pilgrimage has an “owner” and therefore should be given an offer and revered

3 In this manner we have the form of the lightening bolt which was represented in multiple forms from which “the word Chahk, “ **lightening** bolt” , is represented in classic period hieroglyphic texts by a portrait of a zoomorphic deity wearing a shell earring. Post classic versions of these Chahk deities are known by the Shellhas designation of God B. The Maya believed that a lightening bolt was either the serpent from of a Chahk deity or the ax of a Chahk that had been hurled through the air” (Bassie y Hopkins, 2015: 124).

in the tradition of those who preceded current generations. Offerings and promises, become complementary elements in order to build the relationship with the deity. Therefore, as a Tojolabal elder mentioned the “caves and hills are places of prayer; of forgiveness- they are sacred places to meet the master of life”⁴. In this sense, the meaning that people give to these places is transcendent and links with the sacred. Thus, during the visit to the various points and sacred spaces, multiple devotees and faithful who made a series of requests and acknowledgments congregate; However, is the principal or *rezador* who is in charge and the “gift” of being able to communicate with deities, whether saints or physical entities. Hence, the *rezador* among the Tojolabales is considered as *lightning bolt man*, who is destined to become the intermediary between the gods and the needs of the people and the pilgrims, because the *lightning bolt man* is the one who knows how to ask for the right amount of rain, the abundance of crops and health for people and animals involved in everyday life in communities.

Therefore, understanding the sacred dimension from the culture of the Tojolabales understands part of the cosmos, nature and the life of this people. They are not confined only to the prayers and shrines of the Catholic or evangelical religions, but rather the sacred of the Tojolabales is closely related to practices that give sense and meaning to their lifestyles, among which include the spaces that are recognized as sacred. These spaces are conceived as codes and collective signs that form a mythical spatial territoriality, which gives cohesion and historical memory of the people and also designed as “territorial portions representing the fusion, full of meaning, between nature and culture “(Limón et al, 2015: 7)..

Somehow the pilgrimage among Tojolabales becomes a space of liberation and cultural positioning such as suggested by Dussel when he said that “the whole procession, somehow, is” to occupy “space of the dominator: his city, his square, his temple, and his streets. It is the symbolic earning of his space “(1983: 579-580).

The Tojolabal RITUAL EXPERIENCE: THE CULT OF “LA PILETA” CAVE

The property known as “Nuestra Señora “ (Our Lady), is a farm located in the Chihuahua ejido in the municipality of La Trinitaria, Chiapas. It has been a tradition for decades for Tojolabales from different communities in the

⁴ Fragment of an interview made with Juan Gomez on April 18th, 2014, Las Margaritas, Chiapas.

municipality of Las Margaritas, to make a pilgrimage to visit this town with the intention of making a series of requests for the benefit of their families and community. Undoubtedly, the visit to the patron saint of the farm remains as a mere pretext to visit and worship the large cave (grotto) called La Pileta located halfway up the peregrination trail.

The presence of Tojolabales in this pilgrimage is evident, who year after year participate in the entire journey that starts from the house of the *rezador* to the church of the farm. It should be mentioned that trail also counts with the presence of the Tzeltal and mestizo population of the municipality of La Trinitaria.

From early on, commissions or brigades leave communities from at least two regions of the municipality of Las Margaritas (the Valleys and Mountains) and head to the house of the principal or *rezador* in the municipality of La Trinitaria, Chiapas. Today this position is under the responsibility of Don Jaime, because only a couple of years ago Don Teofilo Santis was the *principal* or *olomal*⁵ in most pilgrimages made by Tojolabales of Las Margaritas and communities of La Trinitaria, however after his death the role was taken with profound responsibility by Don Jaime, since taking over as the principal and at the same time the *gift of the rezador* becomes a lifelong commitment. It is he who performs the prayers in the holy language, since it is considered that only they know the language (it is probably a kind of old Tzeltal, although Don Jaime mentioned that prayer is done in the Coxoh language).

On one hand there is the odd relationship established between Tojolabales with Tzeltal *rezadores* which speaks of a relationship between the two cultures that existed long before the arrival of the Spaniards to the lands that would become Chiapas and particularly in the region of Los Llanos de Comitán. While on the other hand, the process of colonization and subjugation suffered by the Tojolabal people during the colonial period and most recently the rancher period, produced a weakening in certain cultural elements such as prayers in their language, calendrical names, and in rituals and can be also seen in Tojolabal organizational structures.

Following this ethnographic experience, there usually comes one day before the house *manager or principal*, either in the afternoon or evening, and this is where they spend the night. Among the Tojolabal brigades participating in the pilgrimage are the drummers, singers and flag bearers

⁵ He was given the connotation of Olomal, exactly because he was an important person for the majority of the pilgrimages performed by the Tojolabales of Las Margaritas and communities in the municipality of La Trinitaria. He then served as the *rezador* and sage of sacred places (caves and springs) where requests were made for good rains and abundant harvests. An interesting detail in the gift of the *rezador* of Don Teofilo was the ability to make prayers and petitions in the ritual language (a kind of ancient Tzeltal language with certain additions from Spanish, not in Tojolabal).

who arrive playing different musical pieces at the principals house, who is the one who welcomes and fraternally invites them to go and get comfortable, usually in the backyard. Once they have entered the house, drummers, flag bearers and pilgrims visit the family altar, which highlights the image of San Mateo and other saints. After they have *greeted* the saints, they proceed to leave their offering in order to rest, which is composed of candles that will be used at different points that will be visited the next day, or to be blessed by the saints and sacred places and carried as relics to the communities from which they originate.

At dawn, the group of drummers and singers start playing the first tunes while pyrotechnic rockets announce preparations for those who would like to accompany the pilgrimage and join along it along its path. From the principals house, the drummers leave while playing, followed by the singers and the flag bearers with banners of each participating community and among them, the principal, *rezadores* and the faithful.

The first stop is at the Church of San Sebastián of the municipal seat of La Trinitaria, Chiapas, where the pilgrims (including flag bearers, *rezadores*, drummers and singers) perform a set of Catholic prayers and incorporate for the first time a plea in the ritual language by the *principal*.

The next point for praying and beginning a process of preparation for the journey of approximately eleven hours, is the shrine of the Virgin of Guadalupe located in the neighborhood Guadalupe Yalixao in La Trinitaria. After a couple of prayers, the pilgrims begin a process of spiritual preparation starting with walking along paths and mountains, which without a doubt becomes an experience of coexistence and collective learning. While in the town, the rezador with the contingent performs the ritual prayer, and permission is sought from Mother Earth and the process called “undressing flags” starts the walk.

Along the walk the contingent, on paths and hills, is accompanied by traditional Tojolabal music of drums and reed flutes, by those who are leading the pilgrimage. The first point is the arrival to the cave called La Pileta, whose route is approximately 4 to 5 hours away. At this point, the contingent pauses to rest and prepare for the start of the ritual of asking for rain and gratitude.

The rezador and the managers prepare the candles and bouquets that are to be offered up in the cave, and pairs of candles are used and are distributed among managers who help the rezador. The latter is the one who started this ritual cleansing process of the miraculous cross that is at the entrance of the cave, followed immediately by the main prayer in the ritual language by the rezador. Undoubtedly, this is a founding moment of the cosmos-human, deity-subject relationship, as they have entered the cave once they have asked the necessary permission from the entities that protect it.

When they have finished the main prayer, they begin to give the necessary instructions to begin the descent into the cavern. Once the descent has begun, the rezador, with the principal, the pilgrims begin to help the rezador and the managers to place and light a candle in each water drip or source that they find inside the cave. When they find rock formations with greater signs of water, a couple of candles are lit and a couple of bouquets stand as a kind of offering, with the intention to continue preserving this vital liquid and to ask the deities to provide the necessary rain for crops. Also, some believe that the waters deposited in these cave formations have healing powers, as many pilgrims touch the water and make the sign of the cross over their heads or body parts that need to be healed.

They also have the belief that it is in these places where the hearts of the main seeds that make up the daily basic diet are maintained, which are usually corn, beans, peppers, squash and tsilacayote. Therefore such visits are important to the Tojolabal people, as they are a founding act for the survival of their sacred dimension and thus the meaning of life of each of the participants at the family and community levels.

Finally the sacred dimension between Tojolabales is set largely in visiting places that have been collectively considered as sacred and also maintain a collective memory of previous generations, creating meaning in the lives of the subjects.

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Violent deaths in Mexico, a synthesis of two recent decades

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ABSTRACT

Death is considered a maximum degree of damage to the individual's life is a useful indicator to describe the risks in populations, particularly when it comes to violent or cause-specific death. The proposal of the work was to measure death by violence in Mexico during the last two decades: 1990-2011, delving into what happened during the preceding six years. Information on mortality was obtained from the National Health Information System (SINAIS) and denominators from National Institute for Statistic and Geography (INEGI). Specific rates were calculated by sex and date; also the incidence ratios, which indicate excess risk among subgroups were estimated.

The results show that between 1990 and 2005, the risk of dying in Mexico rose from 14.2 to 9.68, ie, the trend was downward; however, the period 2010 to add the behavior is clearly observed up to 23.07 deaths per hundred thousand. Between 2006 and 2011 a sharp rise in the risk of death was observed, about 10 times higher for men than for women, which implies high vulnerability in the family and society.

Keywords: Death, power, structural violence.

Violence is a historical phenomenon. It can be argued that as work transformed human societies, violence constantly reconfigures it. As such, it can be analyzed from different disciplinary perspectives: social, criminal and recently from public health sciences. Violence, according to Reiss (1997), is defined as visible and obvious facts of physical assault that intentionally cause damage capable of producing temporary or permanent damage or even lead to death. However, the intentional use of physical force against such an order to hurt, abuse, rob, humiliate, dominate, reviling, torture, kill or cause death including suicide is a violent action sometimes motivated by a desire for revenge. In addition, “... it must be understood as the interaction between factors that have to do with the psychosocial development of individuals, their neurological and hormonal differences and social processes that occur around them.” (Hijar, Lopez and White, 1997: 2) That is, it has a biological substrate but also a strong social determinant.

Some authors describe forms of violence, defining them according to the victims: children, women, the elderly (Londoño and Guerrero, 1999); the perpetrator: criminal, military, the State (Maldonado, 2014; Pereyra, 2014); Type: manifest and structural (Hijar et al., 1997). In any case, it is the exercising of force / power over another person, on a community or on oneself.

The concept of structural violence stems from the proposal of Galtung (La Parra and Tortosa, 2003), a model similar to an iceberg, where only direct violence is perceived, although its hidden origins are linked to the unmet needs of a sector the population, which is socially unfair because it could be addressed with appropriate decisions. The phenomenon could be understood as an expression of social injustice, inequality, inequity, exclusion and poverty. The concept of structural violence is privileged because:

“I) Both structural violence and direct violence are reasons why an important sector of humanity cannot meet their basic human needs. ii) The term structural violence is useful to investigate the relationship between structural violence situations and forms of direct violence. iii) The term structural violence is useful to introduce the mechanisms of the exercising of power as causes of processes of deprivation of basic human needs. Social injustice, poverty and inequality, derived from dynamics produced by economic relationships, also can be explained starting from political oppression using disparate mechanisms as institutional discrimination, exclusionary legislation of certain groups or fiscal policy and regressive public spending, to name a few. Speaking of violence we are in the semantic field of power. iv) The term structural violence has a burden of a determining and explanatory valuation : Deprivation is defined as the result of a conflict between two or more parties in which the distribution, access or possibility of the use of resources is systematically resolved in favor of some of the parties and to the detriment of others. The term structural violence thus serves as

a reminder that the efficiency occurs in any case at the expense of a form of distribution that is systematically unfavorable to certain parties, that this is controversial and that there are reasons to believe that the situation is imposed by winners and is not wanted by the losers “(La Parra and Tortosa, 2003: 61-62).

Violence as a cause of death is high in Latin America, where homicides are reported as 27.5 per hundred thousand inhabitants, a figure which led in 2005 to define it as the second most violent region in the world (Buvinic, Morrison and Orlando, 2005). Although the greatest regions that are affected are in some regions, as reported by Briceno (2002) by placing greater violence in big cities, which include Rio de Janeiro (Brazil), San Salvador El Salvador), Caracas (Venezuela) and Cali (Colombia). The figures from that report show that Mexico has a lower incidence of death from violence.

Even though in Mexico during the decade of 1990 there was a slight decending tendency in the number of deaths by violence (Lopez; Hijar, Rascon, and Blanco, 1996; Hijar et al, 1997; Londoño and Guerrero, 1999; Garzón, 2010) the phenomenon was not homogenous. However Garzón (2010) states that this reduction does not necessarily reflect the reduction of crime, but rather it may well be due to the consolidation of certain structures of organized crime.

In Mexico in 1979, 17.5 deaths were registered as a result of violence-for every hundred thousand inhabitants. In 1992 it reached just under 20 deaths (19.1) by the same population constant. The differences between entities were clear. In the Yucatan , only three were reported, while in Guerrero there were 57 deaths for the same amount of population. The occurrence was 10 times higher among men, more sharply from 35 years of age. A figure greater than a 15 - fold increased risk in this age group (Lopez, et al, 1996; Hijar et al . , 1997) was estimated. Obviously, heterogeneity in the distribution of the phenomenon pointed to big cities, such as the Federal District (Londoño and Guerrero, 1999; Briceño, 2002), assuming a fact that violence in rural areas was lower, which is contrary to what was identified by Maldonado (2012), referring to Michoacan, where rural areas represent different forms of violence and the resulting deaths are not always recorded.

The independent work Hijar (1997) and Lopez (1996) highlight the effect on vulnerable groups (children and the elderly), and the fact that violence against women is reported in private spaces, while in the case of men it occurs in public spaces. While violence against women is not a minor matter, it will not be treated in this article.

Starting in 2000 there was documented in Mexico, particularly in certain regions of the country, increasing death by violence linked to organized crime and the state’s reaction to it. Although data on violence appears daily in the

media, the magnitude that is recorded is not objectively dimensioned by citizens, who the majority are terrified by the phenomenon.

In light of the events that are shaking the country, this work aims to document the violent deaths in Mexico and highlight some aspects of health in its different dimensions. Also, the data seen in the context of the “war on drugs” declared during the six years (2006-2012) of President Calderon, to discern roughly how the official discourse legitimizes the use of force by the state, with permanent human rights violations, manipulating of public opinion, displacing other need claimed by the population within the national agenda: education and health coverage and higher quality services, more and better jobs and, in general, better quality of life for Mexicans.

METHODOLOGY

A transversal study was done taking as an event of interest the deaths in Mexico during the period between 1998-2011. The digitally based data of the National System of Health Information (*Sistema Nacional de Información Salud* -SINAIS) was recovered, discriminating the causes reported in the International Classification of Diseases (ICD) contained in Chapter XX - External Causes of Mortality - ninth and tenth revision, respectively: *attacks and killings* (E960-E969; X85-Y09) *Suicides and self - inflicted injury* (E950-E959; X60-X84) and *events of undetermined intent* (E980-E989; Y10-Y34).¹

To build the cumulative incidence (IA) of the event, it was defined as:

$$IA = \frac{\text{No.de muertes registradas en el país durante el período}}{\text{Población registrada en el país durante el período}} \times K,$$

The number of events corresponds to the numerator; the denominators were calculated based on data from the Institute of Geography and Statistics (INEGI), and the National Census of Population and Housing, 1990, 2000 and 2010. The population growth was estimated between each period arithmetically, using the average annual growth rate available from the same source. Masculinity reasons were calculated ($R_M = \text{Def. in men} / \text{Def. in women}$) Reasons of incidence $RI = I_m / I_w$ ($I_m = \text{Incidence in men}$, $I_w =$

¹CIE Revisions 9a and 10a. Available at: www.ine.es/daco/daco42/sanitarias/listas_02.doc

Incidence in women) And differences in incidence (where R_m is the ratio of masculinity and RI is the ratio of incidents, which estimates excess risk of dying associated with being male (Hernandez, 2009).

RESULTS

Between 1998 and 2011, 294,791 deaths were recorded under codes of Chapter XX, External Causes of Mortality of the International Classification of Diseases (ICD). The distribution of the event occurs in three main categories or codes: Attacks and killings; Suicides and unidentified intention events.

Table 1. Percentage distribution of cause of death by violence according to main categories (CIE). Mexico. 1998-2011.

Año	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total de defunciones	20424	18815	16738	16451	16754	16852	16393	17153	17516	15633	21250	27909	34359	38544
Agresiones / Homicidios (%)	66.9	65.1	64.1	62.5	60.2	59.9	56.9	57.8	59.7	56.7	65.9	71.0	75.0	70.6
Suicidios (%)	16.4	17.7	20.8	23.2	23.1	24.3	25.1	25.1	24.4	28.1	22.0	18.6	14.6	14.8
Eventos de Intención no determinada (%)	16.8	17.2	15.1	14.3	16.7	15.8	18.0	17.0	15.9	15.2	12.1	10.5	10.5	14.6

Source: National Health Information System (SINAIS).

It should be noted that when comparing 1998 and 2011, the number of deaths due to *homicide* practically doubles; the proportion of this peaks in 2010, when three out of four deaths were reported due to violence. A turning point is also observed in 2007, after which the trend is clearly upward-65.3% of all deaths due to homicide. For this reason the emphasis of this work is located in this category. The phenomenon of suicide has its own characteristics and complexity. In cases of death resulting from events whose intention was not possible to determine only one could speculate.

ATTACKS AND MURDERS

Table 2 shows the behavior of deaths due to assault / homicide. The references to the years 1990 and 1995 are added as a comparison parameter in the approximation of the risks of dying from violent causes.

Table 2. Behavior of mortality due to homicide. Mexico.

Año	Incidencia Acumulada*			R _M
	General	Hombres	Mujeres	
1990	14.8	25.4	3.04	8.2
1995	17.02	31.11	3.27	9.2
2000	11.05	20.28	2.62	7.2
2005	9.68	17.29	2.45	6.7
2006	9.92	17.82	2.4	7
2007	8.28	14.9	1.98	7.1
2008	13.05	24.6	2.58	8.9
2009	17.82	32.94	3.4	9.2
2010	23.07	42.72	4.22	9.7
2011	22.88	41.77	4.43	9

Source: SINAIS and INEGI. * Deaths per 100, 000 people

R_M = Ratio of masculinity

The cumulative incidence -equivalent to the probability of dying from homicide-shows a downward trend until 2006, during the six years of the presidency of Felipe Calderon it increased 2.2 times. Among men, the same behavior is maintained (2.3 times increase), and even among women is not as pronounced (1.8 times) following the same trend. This set of data shows that the phenomenon occurs predominantly among men. As an example, in 2010, 9.7 male deaths occurred for every female victim of homicide in Mexico.

It should be noted that the behavior of the frequency of homicides over 15 years, between 1990 and 2005, show irregular variations. However, the trend during the six years of Calderon shows clear evidence of a steadily upward trend, increasing more than twice the risk of dying violently in Mexico.

The reasons of incidence and the differences between them -proportionally show the risks of dying by sex of the victim - that the probability of being a victim of homicide is ten times higher among men compared to women, as occurred in 2010 (Table 3) when the maximum expression was reported during the described period.

Continuing with the description, Figure 1 illustrates that the behavior of death by homicide in Mexico has had a dramatic increase, consistently over the described period, where 2010 reports the maximum figure.

Table 3. Behavior of the reasons and differences in the cumulative incidence of homicide. Mexico.

Año	RI	DI
1990	8.5	22.76
1995	9.5	27.84
2000	7.8	17.66
2005	7.1	14.84
2006	7.4	15.42
2007	7.5	12.92
2008	9.3	22.02
2009	9.7	29.54
2010	10.1	38.5
2011	9.4	37.34

Source: calculations based on INEGI and SINAIS

Figure 1. Distribution of deaths between 1990 and 2010 in Mexico, according to age groups. The frequency is controlled in absolute numbers. The frequency of the event doubles between 2000 and 2010.

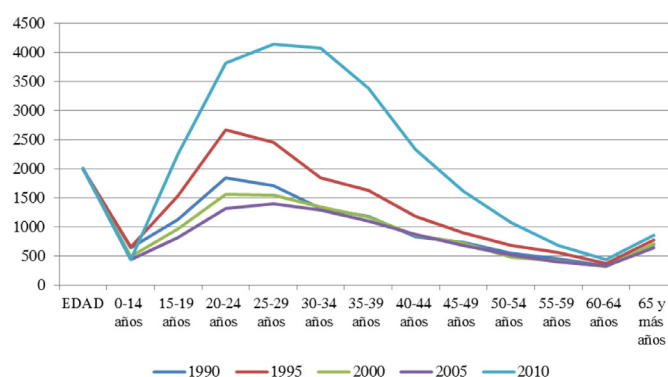
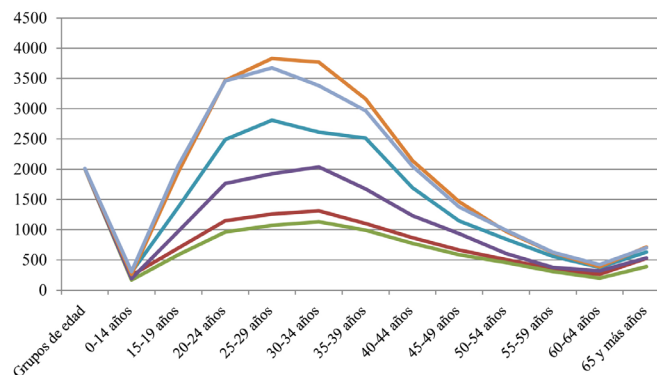


Figura 2. Behavior of male mortality due to homicide, by age, in Mexico, during the six year period of 2006-2011. Note the dramatic increase from the age of 14, with a peak between 20-24 and up until 40 years of age, when the most obvious decline begins.



During the six years of the Calderon presidency (2006-2011) deaths from homicide of an unspecified age increased from 188 to 1,594, meaning that multiplied 8.5 times. When comparing the behavior of this data, the average for the period between 1990-2005 is 202 unidentified men. The age group they belong to was not reported. During the period 2006-2011, the average was 567, which means that it multiplied nearly three times (2.8), which states that at least 95 people each year were placed in a common grave and their families are uncertain of their loss. This figure corresponds to the recorded events, which is distinct to the number of *missing persons*, for which a report is not known.

On the basis of that death was due to homicide occurs during the productive age and considering that every death recorded during the last presidency was on average at least 30 years of healthy life lost (Lozano, Franco-Marina and Solis, 2007) a value can be obtained of 3,182,760 years of productive life disappeared- a regrettable loss in every way possible. The indicator of Healthy Life Years Lost (HLYL) is used, with a purely economic basis, to estimate the potential loss of production time of goods that were not achieved. It is not intended that this aspect is what matters in the described phenomenon.

DISCUSSION

The term structural violence refers to a conflict between power groups. The alarming increase in mortality recorded in Mexico due to killings during the described six - year period inevitably refers to the government 's decision to “*declare war on narcos*” in late 2006 (García, 2011; Bartolotta, 2011). Briceno (2002) argues that in Latin America we do not live in war, but there are

more orphaned children and widowed women today due to violence if there were one. They are called collateral damage, which undoubtedly disrupts the dynamics of the family group, would have been more contributors to microeconomics, greater dropouts rate and the end of opportunities (Garcia & Pacheco, 2000) which is understood as unsatisfied basic needs.

Although, as (Rubio, 1998, cited by Garzon, 2010: 4) state, “The monopolization of illegal markets, a recurrent idea in the literature on mafias and organized crime, is more consistent [to explain the levels of homicide] ... that the notion of a society in which the average citizen is a criminal. “It is essential to consider homicide mortality from a historical and political perspective. That is, unsatisfied basic needs that upsets people.

Contrary to the claims of Zepeda, the most common cause of death from violent causes are not accidents but murders, representing about seven out of ten deaths in the past presidency. We believe that talk of reckless violence is an understatement. This author reports that in 2001, the homicide rate was 40% within Chapter XX of the International Classification of Diseases (10th revision), a figure surpassed by Colombia and Brazil with 76% and 52%, respectively. Ten years later Mexico has 65% of deaths from homicide, which is an indicator of insecurity and unrest among citizens. The incidence of death by homicide in Mexico is comparable to that of Colombia, which reported 26 deaths from this cause, per hundred thousand inhabitants (Zepeda, 2007).

The potential impact of violence on health transcends the physical dimension, with assault causing more absenteeism and direct costs for medical care. It also has an effect on mental health - fear of travelling in certain public spaces in some areas of the country causes tension and sustained stress - undermining peoples quality of life and development opportunities. Recent reports point out that medical and paramedical staff, particularly those from public institutions, have a greater risk of being victims of direct violence.

According to Garcia (2011) the resources generated by drug trafficking are the second source of financing in Mexico (29 billion USD / year), slightly exceeded by oil ² . This would be impossible without the complicity and corruption of institutions and governments. It is paralleled that the estimated collateral damage amounted to 35,000 dead in five years, very close to what is reported in this study figure. According to this author, the alleged drug war has different aspects, but both should be highlighted. First, during the PAN period the State issued speeches to legitimize government inefficiency, which, in turn, is used to justify the escalation of death and permanent violation

2 Esta afirmación es correcta únicamente previo al desplome de los precios del petróleo, a finales del año 2015.

of human rights, particularly in the states in the northern border, which also promoted militarization throughout the national territory. In addition, there was a strengthening of repressive force in the Unified Police Command. Secondly, the adverse effect of introducing the culture of drug trafficking, which has different edges, was emphasized: first the whitewashing of resources through the big screen (film and television) presenting an apology on the lifestyles of criminals and as narco-corridos (songs), that show an easy and immediate alternative for the thousands of unemployed people who yearn to have access to goods that advertising spreads. Both manage the reproduction of the phenomenon in this study. In this regard, we agree with Maldonado (2012) and they can be seen as further evidence of social decay.

In this interplay of interests, where the state legitimizes its ineffectiveness and inefficiency, drug trafficking “conquests public squares” and whitewashing of resources, generates fear among citizens and more than three million years of life are lost during a single presidency due to homicide, it reduces the age at which young people join the ranks of organized crime, and family groups lose parents and children, it leaves orphaned children and widows, which, in turn, disrupts domestic organization, already pauperized by economic policy. In this scenario the public is the big loser.

The number of registered homicides of women, which were much less in this study, should be viewed with reserve as collateral damage, without pretending that women avoid getting involved in crime, since it is known that drug trafficking progresses to the arms market and sex trade (Maldonado, 2012). It is not known how many of these women were also victims of trafficking and sexual slavery. One could even say that the links between death from violence and gender violence are seen most clearly in both border areas of the country. Everything indicates that this violence violates certain, disadvantaged social groups.

Although the criminal violence that affects men more often occurs in public spaces, gender - based violence that occurs in the private area is not addressed in this study, where the victims are mainly women but also include children (Buvinic, 2005), which warrants a particular analysis. In homicide cases, women and children are indirectly affected, which deteriorates not only their physical integrity and economic stability, but also the welfare that domestic groups might have.

The beginning of twenty first century coincided with the change of the political party in power in Mexico, and the fragile balance that the State held with other forces (Garcia, 2011; Bartolotta, Fuentes and Gaggio, 2011) was disrupted, inducing the transition of the overt physical violence and everyday low frequency violence towards a marked expression of structural violence

associated with the exclusion of large sectors of the population ,accentuated poverty and increased vulnerability of a socioeconomic order.

According to the presented data the solution is not glimpsed in increasing repressive forces, nor in reducing the age to prosecute juvenile offenders as adults; Nor, in the establishment of the death penalty or the increase in prison sentences. To this effect, it could consider prevention, although through alternative pathways: i) indisputably rethink the viability of regressive reforms on health, education, and finance; ii) generate more jobs with decent wages, appointed by the International Labour Organization; iii) combat impunity for white collar criminals; iv) punish politicians and officials who inexplicably enrich themselves and those that launder money derived from drug trafficking. Among many others, they represent special interests involved in the group in power.

It is not easy to offer alternatives to address the described phenomenon, but considering that the killing in these two decades is an expression of structural violence requires more effective forms of intervention, redirecting (unfocused) economic policies may be a step in the right direction.

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Cocoa materials of pharmacological interest, (*Theobroma cacao* L.)

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ABSTRACT

The purpose of this research was study of some metabolites of pharmacological importance in the cocoa beans (*Theobroma cacao* L.), which they have been used since pre-Columbian times to make chocolate (Miranda, 1962, Motamayor *et al.*, 2002 a, b) With this, it seeks to create an interest in its propagation and sustainable use, as it has been doing AUDES Cacao - Chocolate Department at Universidad Atonoma de Chiapas in the states of Tabasco and Chiapas in Mexico (López-Báez y Ramírez-González, 2009).

Keywords: Metabolites, alkaloids, flavonoids, anthocyanins, antioxidants.

The states of Chiapas and Tabasco, in southeastern Mexico, are the largest domestic producers of cocoa, with 83,350 hectares (Lopez-Baez and Ramirez-Gonzalez, 2009). In both entities, cocoa production has been decreasing due to the age of plantations, low agronomic quality genetic material, pests (*Phytophthora spp*, *Moniliophthora roreri* and *Ceratocystis fimbriata*), devaluation of the product, an excess of intermediaries, lack of credit and dependence on international prices (González Lauk, 2005 and Ramirez Gonzalez et al., 2014). All of these issues have generated a crisis in families that depend on their crop.

This paper aims to present several metabolites which are present in cocoa beans that are of pharmacological importance, in order to develop an interest in their preservation, propagation and sustainable use in such a manner that its cultivation offers a new social, economic and environmental perspective for all Mexicans. Cacao tree plantations are agro-ecosystems similar to tropical ecosystems, and thereby promote the conservation of natural resources in the tropics. Cocoa, being cultivated together with other species of agronomic interest, provides shade and soil protection, generates oxygen, sequesters carbon and protects biodiversity.

The propagation and sustainable use which involve cocoa producers and researchers is developing in the state of Chiapas and Tabasco by the University Agency for Cocoa-Chocolate Development of the Autonomous University of Chiapas (UNACH) (Lopez-Baez and Ramirez-Gonzalez, 2009).

EL CACAO

Theobroma cacao L. is an evergreen tree that produces a fruit which is the capsule for the seeds. The seeds are separated from the pulp, and are washed and dried or fermented to improve their sensory properties. The dried seeds are roasted, hulled and ground into cocoa paste (Murray, 2007; Clark, 2008; Romero - Cortes, et al, 2013). This paste can be unpleasant, hence it is preferred to be mixed with sugar, milk and other components, which is commonly known as chocolate (Table No. 1).

From the seed, cocoa butter and chocolate or cocoa powder is obtained. Its uses include gastronomic to chemical, pharmacological and in cosmetics (Bridges, et al., 2009). The shell of the fruit contains pectin, pigments (poliflavono glucoside) and chitosan for food use. The fruit pulp in some regions is eaten fresh or juiced, and also to produce vinegar with variable flavors and aromas depending on their aging process (Dominguez, 2012; Villagomez and Arguello, 2013). In Table # 2 the composition of the cocoa bean is shown.

Table 1. Names of chocolate in Mexico.

Producto	Manteca de cacao total	Cocoa desgrasada totalmente	Sólidos totales de cacao
Chocolate	> 18.0	> 14.0	> 35.0
Chocolate amargo scuro	> 22.0	> 18.0	> 40.0
Chocolate semi amargo	> 15.6	> 14.0	> 30.0

Source: (MEXICO, 2013)

Table 2. Composition of washed and dried cacao seed.

Componente	%	Componente	%
Grasa	48 – 57	Teobromina	0.8 - 1.4
Humedad	2 - 5	Cafeina	0.1 - 0.07
Proteina	10 – 16	Flavonoides y Procianidinas	1.6
Carbohidratos	27 – 30	Cenizas	2.6 - 4.2
Fibra	15 – 17		

Source: (Garti and Widlak, 2015)

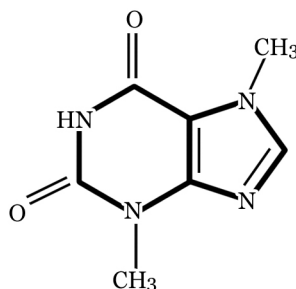
XANTHINES

Xanthines are plant alkaloids found in cocoa, chocolate, mate, guarana, etc.. The main ones are theobromine, caffeine and theophylline (Lorenzo *et al.*, 2009).

Theobromine (Figure No. 1). Theobromine is a nitrogenous substance of the class of methylxanthines (Crozier, *et al.*, 2012). In cocoa paste it is found in concentrations around 1.2% and in a cup of cocoa there is usually approximately 0.1 grams of theobromine (Gil, 2010).

During fermentation the content decreases in part by grain exudation, which is released by the acetic acid produced in the process. It has also been found that it influences the time and temperature of fermentation and in the final theobromine content in the seed ((Korolkovas and Burckhalter, 1983 and Portillo, *et al.*, 2011).

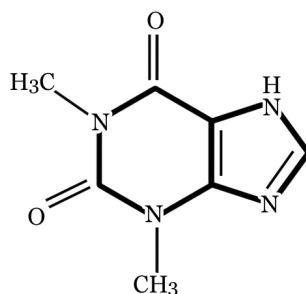
Figure 1. Theobromine (3, 7 - dimethyl - xanthine).



Theobromine is used as a diuretic, cardiac stimulant, vasodilator and muscle relaxant. Its effect on the nervous system is lower than that of caffeine (Velayos, 2009;. Medrano, 2010 and Martinez-Pinilla, *et al.*, 2015).

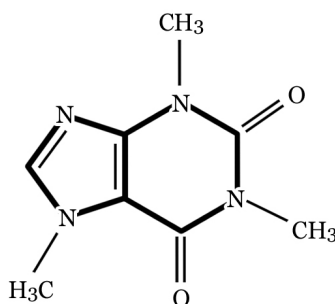
Theophylline (Figure No. 2). It is especially found in tea. In cocoa beans in it has been reported in trace amounts (Harue Wakao, 2002 and Brunetto, *et al.*, 2007). This substance has been used for some time in asthma treatments. It stimulates the central nervous system and increases renal blood flow, among others (Barnes, 2003).

Figure 2. Teofilina (1, 3 - Dimetil - Xantina).



Caffeine (Figure No. 3). Caffeine is found mostly in coffee, tea and cocoa (Lorenzo et al., 2009). Its main effects are as respiratory, musculoskeletal and cardiovascular psychostimulants (Alvarez Garcia et al., 2007).

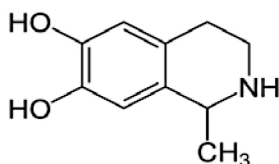
Figure 3. Cafeína (1, 3, 7 Trimetil - Xantina).



Cocoa beans contain between 0.6-0.8% caffeine and in a cup of chocolate there are approximately 4 mg. The caffeine content in the cocoa bean decreases in the fermentation process (Brunetto, et al., 2007; Lorenzo et al, 2009 and Crozier, et al, 2012..).

Salsolinol (Figure No. 4). Through liquid chromatography techniques and electrochemical detection, salsolinol has been identified in cocoa powder in levels of 40 ± 4 mg / g (Riggin and Kissinger, 1976). This substance is related to the addition to chocolate (Melzig, et al., 2000). Currently the salsolinol plays an important role in the treatment of Parkinson's disease. Some foods that contain it are dried bananas, cheese, and wine, etc. (Naoi, et al . , 1997; Morris and Taren 2005 and Xie, et al, 2012..).

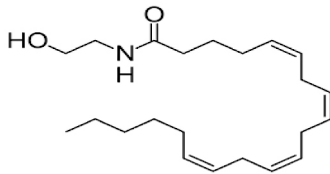
Figure 4. Salsolinol.



Anandamide (Figure No. 5). The anandamide is present in chocolate in amounts of about 0.05 μ g/g with a bioavailability of only 5% (Watson et al., 2012). This substance causes relaxing sensations, and may even induce sleep (Morales J, et al., 2012 and Garcia Sanchez, et al., 2013). Current studies on

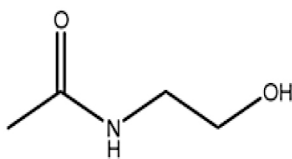
its anti - cancer effects are made on skin cells (Adinolfa, et al, 2013.) and for breast cancer (Laezzaa, et al, 2010;. Mayorga Niño and Torres Vidales, 2014).

Figure 5. Anadamina (arachidonyl - ethanolamide).



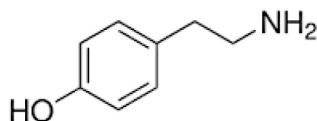
N-acetylethanolamine, N-linoleiletanolaminas and N-oleoiletanolaminas (Figure No. 6). These substances have recently been discovered in chocolate powder. Medical researchers are seeking therapeutic strategies for their use as neuro protectors (Fowler, 2003;. Capasso, et al, 2011 and Morales J, et al, 2012.)

Figure 6. N-acetylethanolamine.



Tyramine (Figure No. 7). Tyramine is present in chocolate, cocoa, wine, processed meat, dried fish, papaya, beans, peanuts, etc. (Vasudevan and Sreekumari, 2012). Various studies have been done related to the increase of cardiac activity and blood pressure, as well as the satiation of appetite (Alkema, et al. (2005).

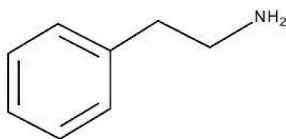
Figure 7. Tyramine.



Phenylethylamine (PEA) (Figure No. 8). This is a common compound in foods such as wine and cheese, and in chocolate it is found at levels of 3.5 to 8.02 g / g (Watson et al., 2012). Several studies have shown that its effects influence mood, therefore it is important in the therapeutic field for

its antidepressant action, among others (Greenshaw, 1989; Shimazu and Miklya, 2004).

Figure 8. Phenylethylamine.

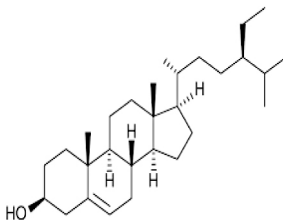


PHYTOSTEROLS

Phytosterols, or plant sterols, are found in seeds, cereals and vegetable oils, avocado, cocoa, chocolate, etc. These have a similar structure to cholesterol (Hung et al., 2008). Cocoa is about 55% lipids. Of these, 0.3% are unsaturated and are comprised of more than 30 phytosterols which content is approximately 230 mg / 100 g, of which the most abundant are Beta-sitosterol, stigmasterol and campesterol (Gil, 2010).

Beta-sitosterol (Figure No. 9). Its structure is similar to cholesterol, but differs by an ethyl group at the C24 chain. Therefore, this compound can inhibit the absorption of cholesterol in the body and reduces levels of it in blood plasma. It also aids in the regulation of liver functions and prevention of cardiovascular disease (Ikeda, et al. , 1989; Plaza, 2001 and Kakade and Magdum, 2012).

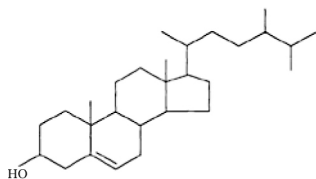
Figure 9. β - sitosterol (3β)-Stigmast-5-en-3-ol.



Existen diversos estudios de los efectos del sitosterol en el tratamiento del cáncer de próstata y colon (Awad, *et al.*, 1996; Dutta, 2004 y Jourdain, *et al.*, 2006).

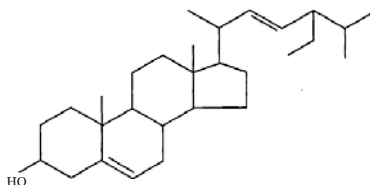
Stigmasterol (Figure No. 10). Among its pharmacological properties are reducing cholesterol absorption in the intestine, prevention of some cancers and it contributes to anti-inflammatory processes. Currently, foods are formulated with phytosterols with the intention of lowering cholesterol in the population (Ju, et al, 2004, Polagruto, et al . , 2006. Gabay, et al, 2010 and EFSA, 2012.).

Figure 10. Stigmasterol [(3 β) -Stigmasta-5,22-dien-3-ol].



Campesterol (Figure No. 11). Campesterol β -sitosterol differs from a methyl group in place of the ethyl group. It is an aid in lowering cholesterol and preventing cardiovascular risk (Ikeda, et al . , 1989; Plaza, 2001 and Kakade and Magdum, 2012).

Figure 11. Campesterol [(3 β) -Ergost-5-en-3-ol].



The ratio of stigmasterol / campesterol content is used to determine the adulteration in cocoa butter (Jee, 2002) (See Table No. 3). It has been determined that cocoa roasting conditions influence the content of phytosterols (Oracz, *et al.*, 2014).

Table 3. List of stigmasterol / campesterol in cocoa butter.

Esteroles gr/kg	% de Estigmastero / % de Campesterol
1.8	2.8 - 3.5

Source: (Belitz and Schieberle, 2009)

POLYPHENOLS

Polyphenols are characterized by having phenolic rings. These bioactive substances have antioxidant capacity due to its molecular structure (Giacometti et al., 2015). The content of antioxidants found in cocoa beans is higher than in wine and tea (Rogers and Alipo, 2008). Some polyphenols identified in cocoa beans and its products are catechins, flavonoids, anthocyanins and procyanidins (Hammerstone et al., 1999).

It has been found that the polyphenol content and antioxidant activity tends to decrease in the processes of roasting cocoa as a function of time and temperature (Ioannone, et al, 2015; McFarlina, et al, 2015), therefore there is surely a higher antioxidant capacity in ground cocoa and less roasted cocoa (Chavez and Rivera Ordoñez, 2013; Zapata Bustamante and Tamay, 2013).

In vitro studies have shown that chocolate polyphenols have the ability to control LDL oxidation reactions or oxidative DNA damage (Maydata Gutierrez, 2002).

Flavonoids: The most abundant polyphenols in the cocoa bean are flavonoids, which are between 6 and 8% dry weight (Grassi et al . , 2008). Some of them are (+) catechin, (-) epicatechin, (+) gallic catechin, (+) -epilagocatechine (Rimbach, et al . , 2009). Polyphenols are beneficial in preventing cancer, vascular health, cardiovascular diseases, and cell damage (Manach and Donovan, 2004). Nehlig (2013) mentions that consumption of flavonoid-rich cocoa can help improve vascular health and increase cerebral blood flow. They also inhibit neuronal death by apoptosis induced by neurotoxins. Other foods containing flavonoids are fruit skin and red wine (Hara et al. 1995), soy, tea (Lopez et al., 2001).

Procyanidins: By using HPLC techniques and mass spectrometry on cocoa seeds, various procyanidins such as B1, B2, B3, B4, B5, C1 and D were found (Hammerstone et al, 1999 and Marcano and Hasegawa . , 2002).

The effect of these substances is of interest for their potent biological activity, antioxidant capacity and reduced risk of cardiovascular disease and blood clots. Some can also be found in cinnamon, grape seed, blueberries, etc. (Santos-Buelga and Scalbert, 2000, Rios, et al . , 2002; Rusconi, et al, 2013.).

Anthocyanins: Cyanidin 3- α - L arabinose and cyanidin 3- α - L - galactose can be found in cocoa. They are water - soluble compounds and responsible for the red, blue, and purple colors of plants and fruit. When the glucoside group is missing they are called anthocyanins (Taiz and Zeiger, 2006). Analysis of anthocyanins (cyanidin-3-glucoside) by UV spectrophotometry,

made by Chavez and Rivera Ordoñez (2013) showed that whole cacao seeds have a content of 1.490 ± 0.043 mg / g.

Generally anthocyanins have an industrial interest for their ability to color foods, as well as in medicine as they are potent antioxidants, anti-diabetics, anti-carcinogenic and can improve visual acuity (Shipp and Abdel-Aal, 2010). Other food sources of anthocyanins are purple and blue corn, berries, red grapes, etc. (Aguilera Ortiz, et al., 2011).

Resveratrol: This compound has been reported to have antioxidant, anti-cancer and cardio protective properties (Vidavalur et al . , 2006). It has been found in grapes, wine, grape juice, blueberries, etc. (Wang et al., 2002). Counet, et al. (2006) reported that through HPLC , trans resveratrol have been identified in cocoa liquors (0.4 ppm) and in dark chocolate (0.5 ppm) in samples from the Ivory Coast.

CONCLUSIONS

Research in cocoa beans have demonstrated that they contain substances with important nutritional and pharmacological potential, which are not found in the same proportions and with the same biological activity in derivatives and which are lost during processing. Its removal and purification is necessary. Many of these substances are also found in other foods such as the resveratrol in grapes, and theophylline in tea. Learning about these properties is of interest to promote cacao conservation and sustainable use in southeastern Mexico, which has a long chocolate tradition.

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Academic plagiarism from the perspective of copyright

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ABSTRACT

In the academic world, there is increasingly a proliferation of literary cases of plagiarisms of intellectual creations that are of a scientific, humanistic, technical, or educational nature, at all levels, on the part of professors and researchers as well as students pursuing their doctoral degrees. There is no doubt that this type of unethical conduct is reprehensible, but within the legal field an analysis from the perspective of Copyright Law is required in order to learn about the consequences or legal sanctions. It is necessary to know what type of right is affected, both of a personal and patrimonial character; how to establish standing for a legal action; what kind of tests are required to verify the materialization of plagiarism; what are the consequences of the usurpation of authorship, and also what mechanisms or actions can be implemented by universities or educational institutions to discourage such practices that affect the entire community.

Keywords: Plagiarism, copyright, moral right of attribution, usurpation, reproduction right, transformation right, original work, derivative work.

«(...) Plagiarism, in my view, is an easier concept to feel than to express: we all perceive easily that a work ... is inspired by another work, but when they determine if that copy is a punishable crime, the problem is exacerbated (...).»

—Antonio Castán

Over the recent five years several news articles of plagiarism within the academic community have been published, both by renowned researchers, teachers, and education officials as postgraduate students of doctoral programs. The cases of Sealtiel Alatríste, Boris Berenzon, Juan Antonio Pascual Gay, Rodrigo Nuñez Arancibia, and Frank Walter Steinmeier [1], among others, have been outrageous and without disdaining the unethical aspect that the dishonesty and discrediting this represents, invites us to reflect on the subject. Such cases have been classified as theft, fraud or misappropriation, so we must take into account the figure of copyright to respond to this kind of behavior which are certainly common but much more prevalent within the fields of teaching and research.

There is no doubt that every person must be guaranteed the exercise of their cultural and educational rights, both to learn and to express themselves, but with full respect for creative freedom so that universities and research centers and teachers must provide certain mechanisms that inhibit the presentation, publication or distribution of third party texts as their own works, since they are acts adversely affecting the work of others lacking any intellectual value whose readings generate a false reality as to its origin, content and authorship, with significance in the community and with profound social impact.

In this sense, the plagiarized material constitutes a text without scientific rigor and without contribution to science, creates uncertainty on

1Case of Sealtiel Alatríste, Coordinator of Cultural Diffusion of the UNAM, published by the magazine Proceso on February 10th, 2012, <http://www.proceso.com.mx/?p=298453>.

Case of Boris Berenzon from the Faculty of Philosophy of the UNAM, published in the Jornada on August 16th, 2013 <http://www.jornada.unam.mx/2013/08/16/sociedad/034n1soc>

Case of Juan Pascual Gay, investigator from San Luis College, published in the Universal <http://www.eluniversal.com.mx/tag/juan-antonio-pascual-gay>

Case of Rodrigo Nuñez Arancibia of the Faculty of History of the University of Michoacan, published by the Universal on August 4th, 2015 <http://www.eluniversal.com.mx/articulo/cultura/letras/2015/08/4/academico-nunez-arancibia-confiesa-sus-plagios>

Case of Frank Walter Steinmeier published by ABC on September 30th, 2013 <http://www.abc.es/internacional/20130930/abci-aleman-plagio-201309292002.html>

the accuracy of what is indicated by its content and mistrust of those who says it is true, causes deception and hides information, functions as an instrument for counterfeiting of certifications and the undermining of professions, and promotes an unfair allocation of grants and scholarships and is a dishonest diversion of public funds for the encouragement of scientific research. Therefore, as recently published in an offhand way:

“In the mind come questions like... Do you consider a plagiarist the researcher or writer who takes up an idea put forward by another author? An author or compiler who is retakes what is expressed by several writers or researchers? Is one considered to be an author of a thesis or scientific text if one copies the brief texts from their tutors? There are plenty of concerns about this issue , and although it is not new, in the world of science there is an increase in the cases which occur in academic sectors, which work is disqualifying or accused of being plagiarized, without being able to determine clearly whether there really was an encroachment on the ownership of the work protected by copyright, or if someone did not care to make a correct citation of work from texts or sources of compiled works which simply is an unauthorized publication of a version or derivative work “(Morales, 2015: 12)

Moreover, undoubtedly the digital environment has facilitated the dissemination of contents, the access to various sources of queries, data transmission, dematerialization of works, and the handling of more information for quick and simple texts without any restrictions, which is why you should be much more careful with the review and analysis of the work as well as the implementation of the guidelines, protocols and research methodologies, to avoid prejudicing the scientific work with malpractices within academia, since even a bad date or an inadequate word citation pattern can give a reprehensible mistake.

Thus, the behavior to be tested is the false attribution of the work of others or posing as one’s own work the writing of someone else performed by processing the transcription of texts, the removal of fragments, the summary of ideas with simple paraphrases, the modification or replacement of words or formal changes in expression, or hiding the authors credits or omission of the sources. How many times have we heard the phrase “the work of the companion was shot” or “this work is a gun.”

The notion that we now have of plagiarism originated in light of a different concept and was related to theft, as Antonio Agúndez illustrates noting that:

“[...] Marco Valerio Marcial accusing Fidentino of being a plagiarist poet for having copied verses masquerading as his own, and he is accused by the commission of a manifest theft, of being a thief. [...] Because a plagiarist was, in ancient times, the

person who appropriated another's slave and also which made his slave a free man; thus incurring the crime of theft, described as serious as the Flavian Act contained in the Digest "(Agúndez, 2005: 1).

Whatever the proof of this historical fact of the copying of verses and an accusation such as a plagiarist poet, at that time there was no such regulations for the protection of authors against the use or exploitation of their creations, or penalties for the involvement of personal interests in his capacity as literary artist by false attribution or editorial changes; and any case, the usurpation of the creative attribute is equated to the simple theft of a something by misappropriation, without consent of the owner of the parchment or paper which contained his work.

Without focusing on the international legislative evolution, nor in the doctrinal influences on the copyright, the personal interests of a writer such as the recognition of his authorship and respect for the integrity of the work created by him, are contemplated internationally, [2] and the protection of authors and in our country under the first rules for writers which retain the copyright on their work starting in the early nineteenth century, had its genesis with the Decree of 1846 and the Civil Codes of 1870, 1884 and 1928, up until to the federal copyright law of 1948 and subsequently in 1956 with substantial reforms in 1963, which were repealed by the current law, which considers punishment for the usurpation of other people's property and counterfeiting by publication of all or most of the work without their permission.

The sanctions are historically for two different behaviors: one against false attribution of authorship and the other by the unauthorized publication of a work.

On many occasions it has been commented that the concept of plagiarism is not provided within the Mexican legal system, which is incorrect because there is an isolated thesis concerning the penal injunction under review, number 6218/47 dated on October 27th, 1948, Fifth Period, Tome XCVIII, page 797, of the Judicial Weekly of the Federation, which states:

FORGERY OF LITERARY PROPERTY, CRIME OF (PLAGIARISM). *The denouncement of plagiarism does not exist, if it refers to different arguments, although the subject is the same. What the law prohibits is the reproduction of a work that is*

2 The Inter American Convention on Copyright in Literary, Scientific and Artistic works (Article XI) published in the Official Register of the Federation on October 24th, 1947 and the Bern Convention for the Protection of Literary and Artistic Works (Article 6) published on January 24th, 1975.

properly registered, but not on the same topic of other works. And if the issue has entered the public domain, the concept of reproduction, to which reference has been made, should refer to the nuances, fundamentally, since it is in them where you will find if an argument either has been individualized, or has been reproduced so that the other may exist. If the subject gives a common inspiration, its development must differentiate, and should be individualized to each work, because the issue is not devised by the authors, because it existed prior as a common heritage, so, when you register your argument to one of them, and to grant the State that record, the subject is not covered, but rather how to develop the same argument, of which he is the owner. If now there is a common inspiration, for being the same theme, there is no crime if the respective development, the nuances that exist in each of the works or films concerned, and between them and the argument of the complainants, are in such different ways that it is not asserted that there is a denouncement of plagiarism, because there was no reproduction of the development of these complainants, the determination of the Public Ministry to refrain from criminal action is correct.

The above transcription confirms the difference between simple ideas with the expression of the arguments that is really the object of protection and thus, for the determination of plagiarism, it is required to prove that the behavior consists of the reproduction of the original expression (arguments) and not on the ideas contained in the work itself. In other words, there is no plagiarism in the thematic coincidences or similar ideas, which causes many more complications in order to recognize what you can and can't take, paraphrasing or quoting of another person's work based on their reading, or whether it will inspire one mind to express our own ideas.

In order to prove plagiarism it is necessary to practice a comparative trial, with the confrontation of the two works in conflict, which happens to be the original, pre - existing or primal, and the second is merely a copy devoid of originality or intellectual input, with the support of a specialist or professional related to the nature of the plagiarized work.

The current Federal Copyright Law (*Ley Federal del Derecho de Autor -LFDA*) [3] does not provide any definition of plagiarism, with not one reference to this concept, much less a catalog of cases or ways to check.

The Act is recognized as a personal prerogative of the copyright to a moral right, with the characteristic of being non-renounceable, inalienable, indefeasible, imprescriptible and fixed perpetually to author; within that right is the right to determine whether his work is to be disclosed and how, as

3 Published in the DOF on December 24th, 1996. The most recent modification was published on June 14th, 2014.

well as to demand the recognition of his authorship at all times and respect for the integrity of the work created by him. For such purposes Articles 3, 11, 18, 19 and Sections I, II and III of 21 states:

Article 3. - The works protected by this Act are those of original creation capable of being disclosed or reproduced in any form or medium.

Article 11. Copyright is the recognition by the State for all creators of literary and artistic works under Article 13 of this Law, under which grants its protection to the author 's enjoyment of prerogatives and privileges exclusively personal and patrimonial. The former constitute moral rights and the latter economic rights.

Article 18. The author is the sole, original and perpetual owner of the moral rights over the works of creation.

Article 19. - The moral law is considered united with the author and is inalienable, imprescriptible, non-renounceable and indefeasible.

Article 21.- The holders of moral rights may at any time:

- I. Determine if their work is to be disclosed and in what form, or to remain unpublished;*
- II. Demand recognition of their authorship regarding the work created by them and provide that disclosure is made as an anonymous or pseudonymous work;*
- III. Demand respect for the work and object to any distortion, mutilation or other modification of it, as well as any action or attempt to cause the same demerit of it or prejudice to the reputation of its author (...)*

In accordance with moral right of the author, the appropriation of another 's work to pass as his own results in the usurpation of parenthood or false attribution of authorship (transgression of the recognition of his authorship) and, where appropriate, the involvement of the integrity of the work by possible modifications, alterations or mutilations made by simulated or substantial reproduction of the plagiarized work, which provokes and legitimizes the legal action by the author himself against violators of the law.

This type of conduct is legally punished with greater possibilities in civil matters than in the criminal court as discussed below, regardless of labor, academic and institutional implications for the action of plagiarism, as it constitutes a wrongful act or damage to the moral right of ownership, but their origin or competent authority is conditional upon the existence of other elements, from seeking to gain or profit with the publication of foreign

material, to act or not in bad faith by the partial reproduction of a work without strict adherence to the editorial rules, for example a citation of text.

In this regard, It has been noted that “ plagiarism regarding authorship can be intentional, by accident or through ignorance, by a simulated or substantial reproduction of a work, whether full or partial, or by the lack of authorial credit of the compiled work “ (Morales, 2015: 12), but all of this is considered elemental and it is very pertinent to ask when are we in the presence of plagiarism?

We can recall that The Royal Spanish Academy (Real Academia Española) defines plagiarism as “the action and effect of plagiarizing (II copy the works of others)” and to plagiarize, among other definitions , is to “copy in essence the works of others, taking them as their own “, which is why it is basic to identify the existence of an act of copying to determine the possible legal sanction to which the plagiarist can be subject, since the types of copying made in academia are vast and the consequences are totally different, being those of a criminal nature as those most serious , of course.

In Mexico, and the Federal Penal Code provides for an offense which in accordance with its elements is linked to one of the many behaviors that could be defined as plagiarism. For such purposes we can see what Article 427 states: “Imprisonment shall be imposed from six months to six years and fines of three hundred to three thousand days of the minimum wage to those who knowingly publish a work replacing the author’s name by another name.”

As seen from the above, we can see observe that a penal type conduct is punishable by imprisonment and a fine of between \$ 21,912 to \$ 219, 102 pesos [4] for who holds the publication of a work (For example an essay, investigation or a simple descriptive technical or practical text) with a different name to that of the author on full knowledge of the fact. However, the reading of that offense must make some clarification of its elements, such as:

a) The one who publishes refers to an individual, but also a moral person, such as a department or agency of government, civil association or corporation, or in other words, among the subjects responsible may be a public or private university, a research or teaching institution, or a publishing house

b) Publication is one of the various ways in which a work is disclosed, so that in terms of Article 16, Section II, of the Copyright Law, we will refer to how to make public a

4 http://www.conasami.gob.mx/bol_salario_minimo_2016_11122015.html (Consulted on March 22nd, 2016) The new minimum wage that went into effect as of January 1st 2016 is 73.04 pesos a day.

work by the act of reproducing it in a tangible form and make it available to the public through copies, or permanent or temporary electronic storage media that allow the public to read or understand it in a visual, tactile or auditory way, so it is not required that there is a commercial speculation or profit or other acts such as the distribution or sale of copies.

c) Knowingly, the subject that publishes the work knew they had substituted a name.

d) By substituting the author's name by another name, the subject performs the change of names, whether the "new" name is his own, for the other real or fictitious or pseudonym, so in the cases of omission of authorial credit we would not be talking about a replacement, since there is a change or replacement of the name of the author.

According to these elements, the criminal behavior is punished for the usurpation of ownership, which is for a very specific case, but at the same time it is ambiguous, since when considering the publication of a work is not defined whether is it integrated, in full or partial, or a simulated, substantial reproduction of the work object of plagiarism, or if it is a version that is not recognized as a derivative work as might happen with translations.

In addition, it is striking that the offense is contemplated as a subject responsible to the publisher and not one who performs the business process of usurpation (those who copy in essence the work of others), since not all cases that substantially copies or reproduces the work is who distributes the work. This act can be carried out by another person such as a publisher or a broadcast group.

On the other hand, the element of "knowingly" is subjective and very difficult to prove, since those who act fraudulently, in a premeditated, illegal or knowing manner is the plagiarist and not necessarily those who publish the work, in any case. It is common that this person only turns in the material for its publication, even including a signed letter under which they respond to the alleged authorship and originality of the work- a motive for which any person whose purpose is the periodic publication or editing on of literary works, or the employment relationship, does not only perform functions aimed at the publishing process but also is responsible for dissemination within the institution, should take the necessary precautions to prevent an act that may be subject to criminal proceedings, as can be seen below when the

"Mexican State considers that the publication of a plagiarized work as conduct so severe to the author that it is considered (sic) a crime, which constitutes unlawful conduct, reproach and is socially criticized. The fraudulent appropriation of which is

object by a person who wrongfully appropriates it as its author, which leads to the deprivation of liberty and a financial penalty, independently of the fine imposed, the moral damage can be repaired by applying an amount which shall not be less than 40% of the price sold to the public of the original product, in terms of Article 428 of the same Penal Code (Morales, 2015: 13).

Finally, it should be noted that such crime is persecuted at the request of injured party in accordance with Article 429 of that Code and therefore it is the affected author who is entitled to lodge the complaint with the federal Attorney General and in the case of plagiarism of a posthumous work only their heirs, regardless of nationality or the place where this the first publication of the work occurred.

Regardless of the analysis of the crime, there are other acts of theft or misuse of the works of others within the much more common academic practice, where the injury is not so serious to constitute a crime, but is no longer considered plagiarism.

Such acts are likely to be sanctioned in a civil court by a judge based on Article 213 and 216a [5] of the Federal Copyright Law, after a lawsuit for moral damage, with the requirement of the publicity of the claimed ownership, the withdrawal of the apocryphal copies and a claim for compensation for damages, or possibly as administrative offense before the National Institute of Copyrights through a request for an infringement on copyright, within the resolution of which may be imposed a fine between \$ 73.040 and \$ 365.200 pesos in accordance with articles 229, 230 and Section XIV, section II of that order.

The origin of these convictions and sanctions, once credited to the legitimation by the subject affected by plagiarism and who demonstrated the type of act plagiarism with the support of an expert, will be based on the violation of the moral right of ownership and integrity of the work as we have already mentioned, and in a complementary manner constitute an infringement to the economic rights of reproduction and transformation by the poor habits of the study, wrong academic practices and inadequate application of research methodology.

⁵Article 216 bis.- The reparation of the material and / or moral damage as well as compensation for damages for violation of their rights under this Act in no case will be less than forty percent of the retail price of the original product or the original provision of any services involving the violation of one or more of the rights protected by this Law. The judge, with an audience of experts, shall fix the amount of compensation for damage or compensation for damages in cases when it is not possible to determine under the above paragraph. For the purpose of this article, moral damage is that which causes the violation of any of the rights referred to in Sections I, II, III, IV and VI of Article 21 of this Law." (Underline is author's emphasis).

Without going into a civil and administrative analysis, I would make a stop along the way to clarify property rights violations which are likely to occur within the academic community.

When speaking about the infringement of the economic rights of reproduction (arts. 16, section VI and 21, section I of the Copyright Law) we could imagine the moment when a work, along with many others, are selected for publication in anthologies, complete or in part, without the prior permission of their authors, regardless whether the compilation represents an original work or is part of a reproduction for scientific analysis or under the criterion of a citation, and as in the case of the economic right of transformation (art. 27, section VI of the Copyright Law) in the case of compendiums, summaries, translations, extensions, paraphrasing or updates, the so called derivative works which although have protection as original works, their authors could omit the indications that they are these types of works and because authorization was lacking (for works that have not yet entered the public domain) to exploit these types of versions.

In this vein, when are we speaking of a derivative work? And when is a work derivative? For this we need these definitions (WIPO Glossary, 1980):

“A preexisting work: is an existing creation that is used to make a derivative work, either transforming (e.g., put in the form of drama a novel) or applying it to a new work (e.g., a story that becomes part of an anthology). Sometimes preexisting works are also referred to original works as opposed to derivative works. The authors and users of derivative works must respect the rights of the author of a preexisting work”.

“A derivative work: is a work based on an existing one; its originality lies either in performing an adaptation of the original work or in the creative elements of its translation into a different language. The derivative work is protected, without prejudice to the copyright in the preexisting work.”

In accordance with the transcribed definitions, it is important to take into account the nature of the original work in order to distinguish it from the second work which is the result of a creative work: the derivative work in its different forms, either for purposes of conversion or adaptation carried out for other than the existing forms, or for the reproduction of the work to integrate it into a compilation or collection.

In this regard, the Federal Copyright Law, in Article 78, confirms that the derivatives in its various forms such as arrangements, compendia, extensions, translations, adaptations, paraphrases, compilations, collections and transformations of literary works shall enjoy the same protection as an

original work, without the author or owner of the economic rights to prevent third parties from developing other versions of the existing work.

It should be noted that the exploitation of the derivative work, including its publication, requires the authorization of the respective author or owner of the preexisting works unless property rights are no longer in force [6] , i.e., that the work has entered the public domain without prejudice and with the consent of the holder of the moral law, in cases where the transformation impacts on a distortion, mutilation or other modification of the preexisting work, as well as any action or acts that cause the same demerit of it or prejudice to the reputation of its author.

Moreover, the same Federal Copyright Law provides an exception to the economic rights of reproduction the case of citing texts or copying short excerpts in educational or research areas, as long as they comply strictly and together with the following [7] :

- The appointment of texts or fragments are of works which are already disclosed or published;
- The author (authorship) is recognized;
- That the source is acknowledged and the work (integrity of the work) is not altered;
- That the quotation is not a simulated and substantial reproduction of the content of the work, and
- That the fragments of works are for critical and scientific, literary or artistic research.

6 With the amendments to the Copyright Law of July 23rd, 2003 which entered into force the following day, Article 29 of the Copyright Law establishes the term of the economic rights in literary and artistic works in the author's life and one hundred years after the death of the same: "Article 29. – The economic rights are valid for: I . The author's life , and a hundred years. When the work belongs to several coauthors the hundred year period is counted starting from the death of the last author, and II. One hundred years after reported: a) Posthumous works, as long as the disclosure is made within the period of protection of works to which section I refer, and b) The works made in the official service of the Federation, the states or municipalities. If the holder of the other economic rights of the author dies without heirs, the right to exploit or authorize the exploitation of the work belongs to the author and, failing that, for the State through the Institute, which shall respect the rights acquired by third parties prior. When the terms provided in the sections of this article come to pass, the work will pass into the public domain." . All terms established to determine the protection afforded by the Copyright Law shall be calculated from January 1st of the year following the respective in which it had made the initial fact used for the calculation in accordance with Article 9,

7 See Article 148 of the Copyright Law, as well as theories on exceptions and limitations to property rights identified as fair dealing, honorable use, loyal use or fair use , legal licenses and compulsory licenses.

The compliance of these requirements or conditions for reproduction of parts and of existing works for the creation of another original work, constitute an authoritative conduct, and, and is guaranteed under the fair use of a real source of knowledge and the generation of science with the integral expression and identification of authorship if we are interested in knowing more about the work, since it is fair and correct to give everyone his due according to Ulpiano (“Justice is the habit of giving to each his own”), so that in addition to being careful that the citations of the texts are done correctly, we must also applaud the people who are interested in studying, researching and writing who have the initiative and ability to transcend, give credit to “knowledge, ingenuity, talent, preparation and methodical effort of teachers and researchers” (Morales, 2007: 110), in the full exercise of creative freedom for new research and academic work, since no one owns the idea of a certain subject or simple facts or events.

So, regarding what we should concentrate on doing to prevent or punish academic plagiarism, gathering all our efforts and every institutional instance, is that the quotations of texts are really for illustrative purposes, affirming or supporting our own conclusions or have prior permission for publication of derivative works , because Nettel Diaz has said (2013): “So, if we admit that creation does not come from nowhere, but relies on previous works, it is very delicate to negatively characterize these loans. The tricky thing is, then, is to distinguish between legitimate and illegitimate “(p.146), in order to not generate fear, suspicion, and distrust in the development of mere ideas or thematic study but prevent manipulation, repetition of texts or deformation of knowledge, or in some cases even the perfidious and shameless action of thesis tutors to post as his part of the revised work [8] .

Under this situation, we should be aware of the damage done to the same academic community, regardless of the legal means for punishment, but above all, know how to identify the possible variants of copies or reproductions of works of others in acts of usurpation to proceed institutionally and rigorously with the appropriate sanctions, including where it dispenses information of the author or year of publication of a bibliographic reference, whether or not in a blatant or deliberate way.

The universities and centers of research and teaching must dedicate more time to prevention to counteract cases of plagiarism or discourage bad practices within the academic community. It therefore is considered convenient, among others reasons, to take the following measures:

8 See more at <http://www.jornada.unam.mx/2015/11/21/opinion/024a2pol> (Accessed March 31, 2016)

- Clearly describe the behavior of plagiarism that should be considered as an academic-disciplinary fault.
- Issue specific regulations to contemplate the instance, the procedures, the evidence and sanctions for the fully described various behaviors of plagiarism ;
- Contemplate between sanctions, private reprimand, public reprimand, suspension from classes, compensation for the withdrawal of apocryphal copies, the expulsion from the institution, the withdrawal of academic degrees , cancellation of economic supports , and notification of research groups;
- Design and implement programs, courses and seminars to increase knowledge about research methodology as well as to raise awareness and sensitize the academic community for both the students , teachers and researchers on the conduct of plagiarism and its consequences ;
- Create a Board or University Tribunal composed of officials of proven moral quality , whose function is to review the texts accused of plagiarism ;
- The definition of a list of competent specialists or experts for technical analysis of the accused works of alleged plagiarism, and
- The establishment of clear and transparent methods and instruments for the detection or identification of plagiarized works .

The task is daunting but vital to creating a culture of respect for copyrights, and requires extensive informative, preventive and regulative work to get rid of the proliferation of apocryphal copies , illicit appropriation , and usurpation of authorship of the work of the same academic community , without having the need to qualify the degree or the variant of plagiarism for legal action- The damage is already done!

The improper conduct of students, teachers and researchers will be removed from everyday practice when acting with severity and justice, without circumventing the responsibility with the simple argument academic plagiarism is not a crime.

Within the concept of plagiarism, as we have discussed, is included any form of that simulates or substantially reproduces a work without the correct authorial credit, but we should also be very clear that the ideas themselves, their concepts, principles, schemes or methods, are not object of copyright law, and they can be resumed without any restriction within research for your original expression.

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ACADEMIC
PAPERS



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The School of Cosmic Rays in Latin America

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The School of Cosmic Rays in Latin America stems from the need to promote and encourage young scholars in these areas in the cult of observing the cosmos, as well as our ancestors of the cultures of Mesoamerica , the Maya and Aztecs, or the Andean Incas, did.

Our current vision has been greatly enriched since the discovery of cosmic rays in 1912 from V. Hess, with the introduction of sophisticated techniques that allow us to observe cosmic events, impossible to do with the simple vision of our eyes.

The investigation of cosmic rays is the most romantic story of all scientific research which man has sought, and it was for the need to turn off that curiosity, trying to respond to the many why of things. Since cosmic rays were discovered, scientists have seen the need to carry out their research in increasingly outlandish conditions like climbing the highest peaks, entering caves and deep cavities, traveling to the remotest corners of the earth, such as Antarctica, installing their detectors in the ocean depths or building huge detectors, as in the AUGER experiment in Argentina and HAWC in Mexico.

Man has had to seek solutions, sending their detectors beyond our atmosphere with stratospheric balloons and satellites. In this line of investigation and to understand more about these particles reaching us from the cosmos, they solved some mysteries but also discovered that many more were present and ever more difficult to understand, being amazed and fascinated by the mysteries of the cosmos.

Thus we can observe situations in the universe that would not be possible to do differently, such as the flight of galaxies with incredibly high speeds.



Figure 1. Chacaltaya Cosmic Physics Laboratory, located 5230 m above sea level.

The great contributions to science that several Latin American scientists have given, to name just a few, are Manuel Sandoval Vallarta in Mexico, César Lattes in Brazil, Juan Roederer in Argentina and many others who supported laboratories like Chacaltaya in Bolivia or Huancayo Peru which have constructed an exemplary story so that this tradition is not lost.

Indeed, it was in Chacaltaya at 5230 meters above sea level, where in 1947 the pion or meson p particle associated with the strong forces were discovered, and have neutrons and protons together in the nuclei, by C. Lattes, Occhialini and C. G. Powell, with the latter being awarded the Nobel prize in physics in 1950.

Y es esa la razón por la cual nace esta escuela, que bianualmente se realiza en varios países de latinoamérica, como en:

1. La Paz, Bolivia, (August, 2004);
<http://www.fiumsa.edu.bo/cursos/crc2004/ingles/crc2004.htm>
2. Puebla, México (September, 2006);
<http://vega.fis.cinvestav.mx/~crschool2006/school.html>
3. Arequipa, Peru (September, 2008);
<http://www.physics.adelaide.edu.au/~jbellido/cosmicraysschool/index.htm>
4. Santo Andre', Brasil (September, 2010);
<http://cosmicraysschool.ufabc.edu.br/>
5. La Paz, Bolivia (August, 2012);
<http://www.fiumsa.edu.bo/5scra2012/index.html>

and finally now in these latitudes, at the campus of the Mesoamerican Center for Theoretical Physics located in the region of Chiapas:

6. Chiapas, México (November, 2015);
http://mctp.mx/e_VI_School_on_Cosmic_Rays_and_Astrophysics.html

This region is heir to the great Mayan culture, and it could not be a better venue to bring to mind the memories of our ancestors.

It is just to encourage and promote the study of cosmic physics and astrophysics in our Latin American communities and transmit that passion not only to observe the cosmos like our ancestors, but to deeply understand the mysteries of the universe, we have made this series of schools targeting students and young researchers who want delve deeper into the subject of cosmic rays.

As we heard in various lectures, we have seen that the study of cosmic rays means studying the history of the cosmos from incredibly ancient times, and makes us immersed in cosmic abysses of impressive distances. Indeed,

cosmic rays bring us information about things that have happened over immense distances.

Cosmic rays are the carriers of valuable information on what else happens in those places in our universe and in unimaginable times, because the light emitted by these events travel at the speed of light to us not for thousands of years, but millions and millions of years.

Cosmic rays let us know in which environment are produced and what matter they encounter along the way before reaching us.

Cosmic rays not only give us information of the external conditions of the stars in the universe, but also there are certain particles like neutrinos which bring us information directly from the bowels of the sun because that is where they originate through thermonuclear mechanisms .

Meanwhile, other higher energy neutrinos are carriers of events occurring over unimaginable distances, giving us valuable information about the conditions in which they have been produced.

Currently laboratories such as AUGER in Argentina, HAWC in Mexico and the creation of a Latin American network for a joint observation of celestial events, particularly those like watching bursts of gamma rays, makes the sky under continual monitoring.

Moreover, cosmic rays are a tally of high energy, thousands of times larger than those produced in current accelerators which requires us to study the mechanisms of interaction of particles of extremely high energy. Experimentally, this study is done in Mexico with the HAWC experiment and in Argentina with the Auger experiment. Both experiments are enormous and the results are well studied.

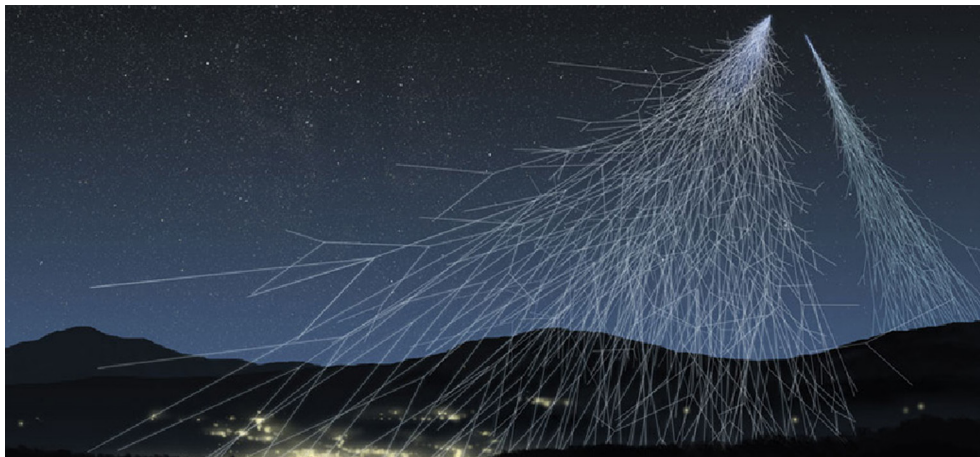


Figure2. The interaction of high energy cosmic rays with nuclei in the atmosphere, which produces an enormous amount of particles that propagate toward the earth.

One of the main scientific goals of HAWC is to observe showers produced by high - energy gamma rays. The information that the gamma rays bring us, as messengers of cosmic events and sources of cosmic rays, makes them so extremely important.

Cosmic rays are also being studied from space through stratospheric balloons or by satellites, for example, like the Pamela experiment launched from a base in Kazakhstan.

Another experiment is on the space station, known as the AMS (Alpha Magnetic Spectrometer) which is currently active, and provides us with cosmic particles with predictions that agree with our calculations. However, besides this more accurate information, anomalies have been found in the number of observed positrons as well as with the PAMELA experiment, which can be explained only by the presence of dark matter. Indeed, understanding the real nature of the universe in which we live and that has evolved after the Big Bang is one of the main objectives of physics of our time. What is the invisible mass in space made of, which now identified as dark matter? Where is antimatter produced?

The mystery of dark matter, this unknown and mysterious matter, is present in the deeper areas of the universe which can be perceived only indirectly and with very advanced techniques. It would seem that what we see is only a very small part.

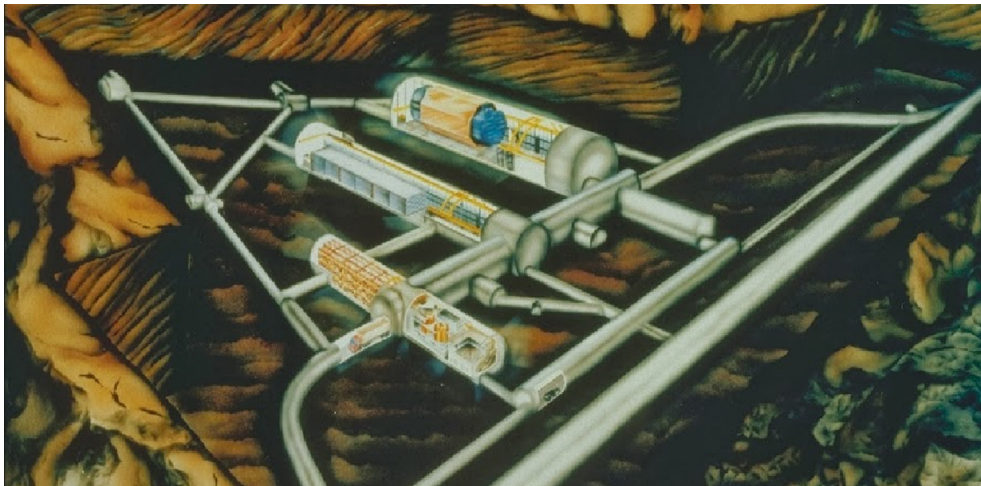


Figure 3. The subterranean laboratories of Gran Sasso, Italy-equivalent to 3000 meters of water depth, where many famous experiments such as the search for dark matter are performed.

Moreover, there is another type of information that bring us neutrinos , like messengers of those mechanisms occurring inside stars. In particular there is one that is really close to us, only 150 million kilometers away, which gives us a precise idea of these mechanisms. Thus, data from a neutrino telescope installed in the depths of the earth gives us directly the temperature inside our sun. Not only are they observing neutrinos from the sun, but we have also discovered that these neutrinos transform into other types of neutrinos. This idea was first given by the Italian physicist Bruno Pontecorvo in 1958, known as neutrino oscillation.

Neutrinos also come to us from very distant events such as the explosion of supernovae. In order to detect these particles, it is necessary to enter the depths of the earth.

It is known that there is a very weak galactic magnetic fields that are 3 microgaus, and yet it is enough to deflect cosmic particles, such as protons. They travel very far distances and do not show us the point on the celestial sphere where they have originated. Gamma rays and neutrinos do not suffer from the action of the magnetic field, which, if we know where these particles come from, we could know where they originate. Hence , there is importance of recognizing the gamma rays and / or neutrinos, because they give us accurate information directly from the source and the sources of these particles.

Another fascinating aspect of the research is to detect cosmic rays from outer space. It is important, in fact, the development that has been performed for the JEM-EUSO project which is an experiment that will be installed on a space station and will aim to observe extremely large showers. The frequency of energies events are > than 10²⁰ measurements with ground - based detectors which is about 1 event per year per 100 square kilometers.

All of these topics are covered during the school where young people have participated as representatives of Brazil, Nicaragua, Panama, Ecuador, and Mexico, with teachers from some Italian universities in Roma, Torino; Rikken, Japan, Los Alamos, USA and of course from the University of Chiapas and other Mexican universities.

Each topic has been confronted by each of the representatives, transferring their experiences into research through their calculation methods, the errors that they encounter and how they decide to solve them .

The whole experience, as in other past school, ended positively having made treasure of the teachings of scientists from around the world. The fact that students have become familiar among them and above all have learned about cosmic rays while being together with scientists, has been based on much experience and this will serve to undertake the work and future tasks.

Until next time ,wherever that may be, in any other Latin American country willing to invite us .

All references are on the website of the School:

http://mctp.mx/e_VI_School_on_Cosmic_Rays_and_Astrophysics.html

— Reception: February, 18—

Factors which contribute to obtaining 500
points on the TOEFL exam as a requirement
for obtaining a degree in Tourism Management
from the Autonomous University of Chiapas

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SUMMARY

The purpose of this study is to identify factors that allow college students majoring in Tourism Management at the Autonomous University of Chiapas to obtain 500 points in the Test of English as a Foreign Language, a requirement for graduation. This project arises from the need to identify why students do not obtain the required score on the TOEFL test and analyzes the way in which the curriculum helps students gain the skills needed to succeed in this test.

Keywords: TOEFL, curriculum, Bachelors program in Tourism Management, degree requirement.

The tourism professional has to face a globalized, changing and competitive sector. It is therefore necessary that the quality of education received throughout their training is based on high standards provided by specialized institutions in certification and evaluation of educational quality at the top level.

These institutions of evaluation of higher education converge on the need to point out the strategic importance of education as a key to generate the development of societies. For this reason, strategic guidelines serve as a framework for evaluating options that each school should apply to increase the quality of effective teaching.

One of these guidelines is for the TOEFL (Test of English as a Foreign Language), one of the tests of English language proficiency used worldwide, and which is used as a requirement to obtain academic degrees, participate in exchanges abroad and even get visas to visit some of the most important countries. More than 9,000 universities and higher education institutions in approximately 130 countries accept TOEFL scores, which make this test one of the most reliable.

Based on the above, it can be said that the guidelines that are included in the TOEFL test as a requirement for qualification for students of the Bachelors program in Tourism Management at the Autonomous University of Chiapas are well founded. The question is then why this requirement often prevents students from earning their college degree, and should extra time be dedicated in preparation for obtaining the 500 point minimum requested by the university?

This question served as the basis for this investigation in order to understand and analyze the contributing factors in obtaining the necessary points in the TOEFL. An analysis was done on way in which the curriculum influences obtaining these points and some modifications were identified that could be made to the plan or , where applicable, the proposed institutional strategies to help students reach that goal.

IDENTIFYING THE PROBLEM

This investigation was conducted in order to understand and analyze the factors contributing to obtaining 500 points in the TOEFL exam as a requirement for qualification for the Bachelor of Tourism Management. This represents a problem for some of the graduates, because they do not have the skills required for approval.

The curriculum of the program in Tourism Management makes reference to the following:

“Among another of the features of the curriculum is learning the English language, which includes two English courses at the basic level, which may be accredited by placement tests. In addition, it is established as a requirement for obtaining the degree. The English language will be studied at the corresponding faculty or school where teachers are assigned by the language school, up until the sixth level of the language program, as well as preparation course for implementation of the TOEFL which allows the student to pass the exam (500 points). For this purpose the classes “English for Daily Life” and “Professional English” are valid as first and second levels.

In the case that the student obtains 500 points on the TOEFL exam in another language school, the student may provide the evidence of their efforts through the presentation of the corresponding official document.

In order to improve the performance of the student during their study time, they will have the support of a tutor through the institutional tutorial system” (UNACH, 2005: 20).

The curriculum includes two courses aimed at learning English, while the other four levels that are mentioned should be taken on an individual level and do not represent a value in degree credits.

Currently there is not a specific figure on the number of students who manage to accredit 500 points for first time they take the test, or even how many opportunities they need to get the desired points. Students have different educational options to take the exam and many decide to spend more or less time preparing as they deem appropriate after having graduated from the program.

There are factors that contribute to not getting the 500 points on the TOEFL exam, such as a lack of motivation on the part of students, the few options for learning English in the Autonomous University of Chiapas, deficiency in services offered in the Department of Languages, the lack of financial resources to attend private classes, and the lack of time that students could devote to extra-class language learning, among others.

METHOD

This research project was conducted under the qualitative approach, through an epistemological constructionist perspective, interpretative from the theoretical perspective and used evaluation research. The general objective was to know and analyze the contributing factors in obtaining 500 points in the TOEFL exam in order to assess the curriculum of the Bachelors program in Tourism Management, to see if it helps to achieve that objective and to provide

information for the decision making process involved in the adoption of a particular educational policy as well as guide the planning, monitoring, and implementation of a policy.

This project used interviews as the main technique for gathering information, since the qualitative interview is more intimate, flexible and open. This is defined as a meeting to exchange information between one person (the interviewee) and another (the respondent) or others (respondents).

One of the interviews that were conducted in this research project was semi-structured, and was based on a question guide. The interviewer was free to introduce additional questions to clarify concepts or obtain more information about the desired topics (i.e. not all the questions were predetermined) (Hernandez, 2006).

In this research project a semi-structured interview with the Coordinator of the Department of Curriculum Development was conducted with the following format:

Figure 1. Semi-structured interview guide for the staff of Curricular Development of the Autonomous University of Chiapas.

Guía de entrevista semi-estructurada al personal de Desarrollo Curricular de la Universidad Autónoma de Chiapas	
<hr/>	
Objetivo: Conocer las estrategias que pueden implementarse para que los alumnos de la Licenciatura en Gestión Turística logren la acreditación del examen TOEFL con 500 puntos.	
Nombre completo: _____	
Cargo: _____	
a)	Importancia de la acreditación del examen TOEFL como requisito de titulación de la Licenciatura en Gestión Turística ¿Porqué es necesario que Los alumnos de la Licenciatura en Gestión Turística acrediten el TOEFL con 500 puntos como requisito de titulación?
b)	El plan de estudios ¿De qué manera el plan de estudios de la Licenciatura en Gestión Turística favorece la aprobación del examen TOEFL con 500 puntos?
c)	Estrategias ¿Qué estrategias pueden implementarse a nivel institucional para que los alumnos de la Licenciatura en Gestión Turística acrediten el examen TOEFL con 500 puntos ?

While the semi-structured interview with the Coordination Assessment and Accreditation of the Bachelors program in Tourism Management at the School of Accounting and Administration Campus I, of the Autonomous University of Chiapas had the following format:

Figure 2. Semi-structured interview guide for the Coordination of Assessment and Accreditation of Bachelors Program in Tourism Management at the School of Accounting and Administration Campus I, of the Autonomous University of Chiapas.

Guía de entrevista semi-estructurada a la Coordinación de Evaluación y Acreditación de la Licenciatura en Gestión Turística de la Facultad de Contaduría y Administración del Campus I, de la Universidad Autónoma de Chiapas

Objetivo: Conocer las estrategias que pueden implementarse para que los alumnos de la Licenciatura en Gestión Turística logren la acreditación del examen TOEFL con 500 puntos.

Nombre completo: _____

Cargo: _____

a) **Importancia de la acreditación del examen TOEFL como requisito de titulación de la Licenciatura en Gestión Turística**
¿Porqué es necesario que Los alumnos de la Licenciatura en Gestión Turística acrediten el TOEFL con 500 puntos como requisito de titulación?

b) **El plan de estudios**
¿De qué manera el plan de estudios de la Licenciatura en Gestión Turística favorece la aprobación del examen TOEFL con 500 puntos?

c) **Estrategias**
¿Qué estrategias pueden implementarse a nivel institucional para que los alumnos de la Licenciatura en Gestión Turística acrediten el examen TOEFL con 500 puntos ?

The previous interviews allowed us to see from an institutional point of view, the problem addressed in this research project, while the focal interview that was applied to students in the eighth semester of the degree in Tourism Management aimed to know the point of view of the students about the following questions (Figure 3).

The focused interview is a data collection technique using a semi - structured group interview, which revolves around a theme proposed by the investigator. It is a group discussion guided by a set of questions carefully designed with a particular purpose

Figure 3. Interview Guide focused on students from eighth semester of the Bachelors program in Tourism Management of the Faculty of Administrative Sciences CI Tuxtla Gutierrez

Guía de entrevista focal a alumnos de octavo semestre de la Licenciatura en Gestión Turística de la Facultad de Ciencias Administrativas C-I Tuxtla Gutiérrez

Objetivo: Conocer los factores que influyen en la acreditación del examen TOEFL como requisito para la titulación de la Licenciatura en Gestión Turística de la UNACH.

1. **Bienvenida**
2. **Encuadre técnico:** Explicar los objetivos del proyecto de investigación, obtener el consentimiento de los participantes para la grabación de la sesión, recibimiento y presentación de los participantes.
3. **Duración:** La sesión tendrá una duración máxima de 30 minutos.
4. **Normas de conducción:** El moderador explica que es necesario pedir la palabra, esperar por el turno y respetar la participación de los demás asistentes.
5. **Inicio de la sesión**

a) **Factores que contribuyen en la aprobación del examen**
¿De qué manera se puede acreditar el examen TOEFL con 500 puntos?
¿Existen factores que impidan la acreditación?

b) **El plan de estudios de la Licenciatura en Gestión Turística**
¿De qué manera el plan de estudios de la Licenciatura en Gestión Turística influye en la aprobación del examen TOEFL?
¿Cuántos semestres de inglés están incluidos en el Plan de Estudios?
¿El plan de estudios contempla una preparación exclusiva para el examen?

c) **Modificaciones al plan de estudios**
¿Qué modificaciones podrían realizarse al plan de estudios para favorecer la aprobación del examen TOEFL con 500 puntos?

d) **Importancia de acreditar el examen con 500 puntos**
¿Cuál es la importancia de acreditar el examen con 500 puntos como requisito de titulación?

Despedida: Agradecimiento

RESULTS

The interpretation of the results obtained in this research project is done according to the following questions:

What are the contributing factors in obtaining 500 points in the TOEFL exam as a requirement for obtaining a degree from the Bachelors program in Tourism Management from the Autonomous University of Chiapas?

One of the factors found is the lack of interest from students, as the interview with the Coordination of Curriculum Development confirms:

“... The other side of the problem is the disinterest in learning a language, we still do not have a culture of going out into the world, we do not yet have the culture of travelling, the university is driving this strongly, 100% of kids that ask for exchanges and meet the requirements, are supported, but we continue to give privilege to Spanish - speaking countries, right? ... “

Similarly during the interview, the Coordination of Assessment and Accreditation of BTM stated:

“... During these investigations what we have had is not failure, is not lack of time, not even the financial resource , it is indolence and laziness, this is what was found in the two investigations by generational cut offs at different times and both turned out to be apathy to say... I will do in a given time and laziness that I can but don't want to now, because they fail to understand or grasp the dimension more that they are, repeating and repeating and repeating about the vulnerability that is formed in this language and in any other but for one who studies tourism you must be political too ... “

During the interview focused on students of the eighth semester of BTM , students also talked about the lack of interest of students in English proficiency:

Interview 8:

“... Because I also think the same that my companion said, it is the lack of interest, maybe not generalized, but I also know some people who are right now in eighth semester and I talk to them and ask “Hey, what do you think of the TOEFL because you already took it, no? but I know that he has not taken an English knowledge test but as I say you already had English, well I'll see what I'm going to do, you see some aren't interested ... “

Interview 9:

“... To us as we were not students who took advantage of this time we have within the school to bring the English eee in languages ...”

Interview 11:

“... It is because they are not worried; the importance of passing the TOEFL is seen as one of the points that count for certification ...”

Based on the above we can say that the lack of student interest for their improvement of the English language is a contributing factor to not get 500 points on the TOEFL exam.

Moreover, it was found that another factor is social inequality. During the interview with the Coordination of Curriculum Development the following was said:

“... There are problems of inequality that are structural, were are a public university, we receive groups of students from many strata, not only economic, but also cultural and us, all human beings are culture, and among the more literate, more educated, your tool with which you go to college, your backpack to go to camp, it is more nourished, more efficient, then there are many inequalities in our students ... “

Student manifest that inequality exists say that not everyone has the financial resources to take private English lessons to get better results in the TOEFL test in the following way:

Interview 2:

“... There are many who or don't have enough economic resources in order to say that I graduated already, I have my passing diploma; I do not have my degree, now I will dedicate myself to English, then, they have to find a way to work out their own economic resources and this and this is where time is lost ... “

Interview 10:

“... Because sometimes for money or other things we cannot pay outside but I also believe that we if we put a little effort in that we could pass the 500 points.”

In the Coordination of Assessment and Accreditation of the BTM it was mentioned that the inequality starts at the high school level:

“... So I will put it on the table, that is record it yourself from high school they come in bad and lets not talk about further back, , we would have very few students who would achieve three hundred and fifty points or more, almost at the B1 level of the common framework of European reference ... “

Inequality among the students of the BTM is natural, because the university is public and receives students from different social and economic strata, so the insufficient academic training they have at the high school level is observed, which does not reach to provide the idiomatic foundations for the mastery of the English language.

Another factor influencing obtaining 500 points in the TOEFL exam, now from the point of view of the students, is the lack of tools for understanding the language which should be provided by the University:

Interview 7:

“... there are a lack of tools, tools that are not like an example like as if an example may be what, its that the university requires 600 points sorry I mean 500 and the university requires the points from us they should give us tools not for the entire program there will by one or another subject and we say what ‘s up with this subject I think that maybe that these subjects we can remove and put English in its space and it would be a pretty nice solution for everyone ...”

Interview 9:

“... Another thing that is unfortunate that we have been in (the) language (school) the same we are witnesses that the system is somewhat lacking because apart from that it is slow there is a lack punctuality by teachers and many absences that as a school of a department precisely here at the UNACH it is not like studying in a private school where I am paying and I can demand for those services ...”

Interview 10:

“... There are the tools that the school does not give us for this because in order to have a good level of English ... of both the school and us as students or the school will not give the tools sometimes for money or other issues we cannot pay off campus (private schools) but we think if we put a little effort in that we could pass with 500 points ...”

It can be assumed that the factors that influence obtaining 500 points on the TOEFL exam as a requirement for certification of BTM is the interest of students, inequality and tools of knowledge that the university provides them.

How does the Curriculum of the Bachelor Program in Tourism Management influence in the accreditation of the TOEFL?

The Coordination of Curriculum Development mentioned that:

“... In general in our university the use of a foreign language as a requirement for admission is not required, at other universities themselves yes, eh ... then we start from the fact of starting over, the kid again is going to her first semester of English, that is a problem that delays their progress, what could be going ahead, do a job of refining the

language if you already had a base, that's our general framework, I think it's important for me to point out ..."

Meanwhile the Coordination of Assessment and Accreditation says:

"... Perhaps the mistake that was made was not ... was not to set limits or a criteria of a requirement of permanence as happened in the two previous programs in tourism management, so that in order to enroll in the fifth you needed to accredit four semesters in a row and there you are only asked for six and it was the same for tourism ..."

The prospect of students is clearer however, they mention that the curriculum does not encourage them to obtain 500 points in the TOEFL exam:

Interview 1:

"... I think not because, as they are only two months, there are two semesters, sorry, there is little information, it is basic English and in two months, sorry, in two semesters is very little, usually ... the UNACH maybe should support us more like in the other undergraduate programs like engineering which give you up to four semesters of English and us in tourism management and we do not give us a long time to take English ..."

Interview 2:

"... It would mostly be that English was a matter not of two semesters, but during the whole program which would be the most appropriate for us to come out more prepared in regards to needing to pass with 500 points ..."

Based on the above it can be said that there are deficiencies in the design of the curriculum of the BTM that do not promote students to earn 500 points on the TOEFL, among which that could be mentioned are poor academic load of the English language, the lack of an entrance requirement certifying that students have some knowledge of the language and finally a permanence requirement.

Why is it necessary for students of the Bachelors Program in Tourism Management accredited the TOEFL with 500 points as a graduation requirement?

The importance of obtaining 500 points in the TOEFL test lies in the guidelines that the assessing body CONAET established for institutions that wish to obtain certification of their plans and curricula, which are explained in the words of the Coordination of Curriculum Development:

“... the BTM has an accrediting body that is CONAET which is the National Assessment of Tourism Schools, that's CONAET. The CONAET like any assessment body has a number of parameters to consider certain studies of quality and others non - quality. The undergraduate program in tourism management is taught in two schools- one is at the faculty of accounting and administration on campus I in Tuxtla, and the other is at the faculty of management sciences in IX campus in Tapachula. Both programs are accredited by CONAET and both were recently re - certified as CONAET programs. CONAET has a very high level of demand for the points on the TOEFL- it is an organism that asks for more than 500 points, if memory does not fail me, right now I do not remember exactly, but if you are asking it is more than 500.. Well ... then our programs, so that they can be accredited, must be aligned to their parameter, that is one of many reasons, the other, belong to the international context, any college student should have good knowledge of the English language ... “

Moreover, the Coordination Assessment and Accreditation of BTM explain that the importance of students to earn 500 points on the TOEFL test is as follows:

“... It is necessary because the accrediting agency at the national level and the council for social and civil tourism education CONAET required as a fundamental requisite in order to talk about a quality educational program, just as it is a trend of international students not only in the areas of tourism, any professional need to demonstrate proficiency in mastering a language, in this case English , considering the universality of the application of the language and even for us it is an exception , five hundred ,when we really ask five hundred fifty points which is the B2 level of the common framework of European reference, then the importance apart is that as a student who is dedicated to tourism it is one of the languages that have to speak more often or to whom, who are you going to speak English too, huh ... give it that power and demand it as an option ... as a requirement for graduation, sorry, because we are working on the assumption that makes you more competitive in the labor market and gives a guarantee that the student, the graduate, the professional accounts for at least one additional linguistic element that makes it easier to enter this labor market ... “

It can be concluded that it is necessary to get 500 points in the TOEFL exam because it is a requirement of assessing body of the LGT and above puts the degree with a high standard of quality in which it is understood that the student has skills linguistic, communicative and service professionals to be successful in the workplace.

What changes can be made in the curriculum of the Bachelors Program in Tourism Management in order to obtain a TOEFL score of 500 points?

There is talk of a restructuring of the curriculum starting this year, the same as the Coordination of Curriculum Development describes as follows:

“... the bachelors program in tourism management is going through a process of curricular restructuring that we hope will be completed within the first fifteen days of October, that is we are going to have a restructured plan, within this restructured plan, the permanence requirement, because we cannot do otherwise, we cannot backtrack, what if we include it in the new plan? Include in the new plan four curricular moments, that is to say that you will have four semesters, that you have to pass, you have to go to class, you have a schedule, you have a teacher to give you your English, no? ... The second language, we are giving you getting four curricular periods noe, that’s the new plan that is not yet approved by the university council ... uh ... I think that part we should pretend to be important ... because all of the bachelors programs will have four moments, four semesters and a little too to work closely with BTM to see how we can engage, make significant from the professional program of tourism, language skills ... “

The restructuring of the curriculum from 2005 may represent greater opportunities for students to succeed in achieving the goal of language proficiency and in the same way open certification options for the English language and thus obtaining 500 points in the TOEFL will not be a limiting factor for many students.

What strategies can be implemented at the institutional level for students of the Bachelors Program of Tourism Management in order to be accredited with the TOEFL with 500 points?

As further restructuring of the curriculum is not a reality, they can be implemented institutional strategies that allow students to get more opportunities in the TOEFL exam. The Coordination of Assessment and Accreditation of the BTM proposes the following:

“... Require that the student, bring me an essay or bring me summaries or an abstract and with that same test we are already making a little pressure for the student to start waking up in the need for language proficiency ... the administration of the curriculum has been made during the management they are promoting activities, courses, workshops, eh ... intensive for the interested student who with their own resources can accredit the language ... “

Furthermore, the Coordination of Curriculum Development mentions the following strategies:

“... First you need to have them feel the truth, a great need of the language, I think we need to work much more on student awareness of what it means, the door that opens the mastering of a second language ... it is to work closely with the language departments, because for the work to be done in the best way, we even thought that classes should be from 7 to 9 because it is time that language flows better, then there are many strategies, the truth is it is a very big concern we have ... “

Institutional strategies that can be applied are the promotion of courses, workshops, activities, set the schedule of English classes in the morning and motivate students in the importance of mastering the English language, among others.

CONCLUSIONS

Based on all the above, throughout this document, there are issued the following conclusions:

- ◇ Factors contributing to the obtaining 500 points on the TOEFL exam as a requirement for getting your undergraduate degree in Tourism Management are: a lack of interest by students in learning a language foreign; social inequality, coming from different social and cultural contexts or being from different backgrounds that facilitate or complicate the learning of English; the lack of tools to perfect the language that should be provided by the university, since getting a 500 on the TOEFL is a requirement to getting your degree from the university, the university must give general English classes and specialized classes to prepare for the exam.
- ◇ The curriculum does not favor getting 500 points on the TOEFL exam, because it only includes two semesters of English as part of the students study hours and it does not include a permanence requirement that allows students to be evaluated before concluding with a degree, and it does not provide the necessary tools for students to obtain constant preparation in order to overcome the requirement for getting their degree.
- ◇ The importance of obtaining 500 points on the TOEFL exam as a requirement for getting your degree lies in the need to accredit the guidelines established by CONAET in which the curriculum is based on quality standards for educational programs. These standards are fully justified with other assessment bodies under the demands of a globalized world in which the dominance of the English language

provides basic skills for good professional performance for graduates of the Bachelors program in Tourism Management.

- ◇ There are changes that could be made in the existing curriculum of the program that assist in achieving 500 points on the TOEFL exam as a requirement for graduating, such as increasing the number of semesters included in the academic program and the application of a placement exam that allows students to focus on what they really need to learn. On the other hand, the implementation of new ways of getting accredited in the English language through distinct certified institutions such as Cambridge, Trinity College, Oxford University, among others.
- ◇ Among the strategies that could be carried out in an institutional manner without making changes to the curriculum to favor the obtaining 500 points on the TOEFL include the promotion of courses, workshops, activities, and more accessible schedules to students and the constant motivation to awaken their interest in learning and dominating the English language.

REFLEXIVE EPILOGUE

This research project began with a question that seemed to have a single answer, but as the investigation was taking place, many answers and new questions arose which helped broaden the perspective from which the problem was being analyzed and ideas gradually began to make sense.

Students of the Bachelors program in Tourism Management of the UNACH face an obstacle of getting at least 500 points on the TOEFL exam as a requirement for graduation, which is why it is hoped that there are reforms in the curriculum because since 2005 there have been no modifications.

It is essential that there is an evaluation of the curriculum so that students can receive an education based on the real needs of today's society that is transformed by scientific and technological advances every day that change the culture and customs of everyone.

It is hoped that this investigation will inspire further research in this field and allows us to see when the evaluation of the plans and programs of higher education are not done in an efficient manner, the plans and programs lose pertinence and are not able to reach the objectives that should be the foundation in the forming of new professionals.

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