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Natural and Formal Languages at the Higher Level

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Abstract: The present work aims to highlight the unification in human thinking of natural languages and formal languages, with their conceptual differences. Technological, economic and political contextuality oblige us to revise curricular programs in order to include the scientific and philosophical advances that have given way to technologies and methodologies, and consequently, to new languages that do not seek to achieve, nor could achieve, the vastness of The linguistic and signistical uses, but which dimension their action in smaller and more specific universes. Approaching these two “languages” would lead to a rethinking of “teaching of language” in its content and teaching strategies.

Keywords: Natural Languages, Formal Languages, Language Teaching, Higher Education.

1. INTRODUCTION

Since our primary education we have developed interest in the subjects related to the use of language, languages in general and communication. It is logical that the various disciplines or cognitive expressions require the linguistic foundation [1], apart from more specific languages than plurality and thematic variety, already in teaching as in research and in its achievements, both at superstructure level and Infrastructure or use, determine [2].

The reflections on language nourished daily by the direct contact with students and colleagues, lead us to the perception that they are right who promote the increase of the curricular load, in Language and Communication, in the pensum of what we could call area Humanistic, but also, and here is the dominant purpose in the proposal in development, in the universe of primary or basic, middle and higher education.

The reflective climate on the subject rises to the urgencies of an unforeseeable curricular confrontation, on the part of the academic, administrative and political institutions, with power of decision in the areas and the educational levels.

The technological, economic and political contextuality, without obviating the ecological, the labor and the demographic, force us to review programs, to exclude or include new themes and bibliographies, or we

would incur professional or civic irresponsibility by avoiding historical changes, which Correspond exclusively to economic, political and military achievements, as scientific and philosophical advances have made strides to astonishing technologies and methodologies, consequently, to new languages that do not seek to achieve, or could achieve, the vastness of linguistic and But which measure their action in smaller and more specific universes, of which, however, much of the balance, communication, laws, food, organization, even the survival of humanity and planetary ecological harmony depend. , Even if it seems to exaggerate to affirm it, space or interplanetary investigations already give us information until recently ignored.

These Specific Cognitive Universes (UCEs) are Routine Instruments (IRs) of particular and varied professional communities, some of relative affinity between them and others of more restricted spectrum and abstraction, which make them almost invisible but usually assume mathematical forms of unalterable precision.

The two realities referred to at the beginning of this discourse are: Natural Languages and Formal Languages [3,4]. In both cases there are conceptual differences, but there is only one inevitable reason that unifies them: human thought.

2. NATURAL LANGUAGES AND FORMAL LANGUAGES

The linguistic phenomenon presents two corresponding faces in perpetuity, without one being worth more than thanks to the other [2]: (1) the syllables that are articulated are acoustic impressions perceived by the ear, but the sounds would not exist without the vocal organs; So a n exists only by the correspondence of these two aspects. It is not possible, therefore, to reduce the tongue to the sound, nor to separate the sound from the mouth articulation; To the reciprocal one, the movements of the vocal organs can not be defined if one ignores the acoustic impression; (2) is the sound that makes the language? No, it is only the instrument of thought and does not exist by itself. The sound, complex acoustic-vocal unit, forms in turn with the idea a complex, physiological and mental unit. Moreover, language has an individual side and a social side, and one can not conceive of one without the other. On the other hand, at every moment, language implies both an established system and an evolution, at all times it is a current institution and a product of the past.

Since the late 1950s, with the publication of Alan Turing [4] of the test of turing as an intelligence criterion, when devising computing by a machine operating on chains of symbols arranged on a tape, it could be said that it started To formal languages. Then, in 1956, Noam Chomsky established the hierarchy of formal languages that bears his name and the relationship between them [3]: Type 3 (regular), Type 2 (context independent), Type 1 (Context-sensitive) and Type 0 (recursively enumerable), plus recursive as a Type 0 class but only slightly above Type 1; And defined a specific type of grammar capable of generating only languages within that class and demonstrated that it was enough to relax certain restrictions on the format of the rules to go up steps in the hierarchy (Table 1).

Table 1
Typology of rules of grammar in Chomsky's hierarchy

<i>Type of Language</i>	<i>Restrictions on rules</i>
Recursively enumerable	$x \rightarrow y$, Where x and y are terminal and non-terminal strings
Context sensitive	$x \rightarrow y$, $ x \leq y $, Where x and y are terminal and non-terminal strings
Independent of context	$A \rightarrow y$, Where A is a terminal and yes a chain of terminals and not terminals
Regular	$A \rightarrow wB$, $A \rightarrow w$, Where A and B are non-terminal and w is a terminal chain

Source: [4] p.62.

This has led to the use of linguistics and cognitive sciences to the processing of natural languages (PLN) in the field of computer science and artificial intelligence.

3. METHODOLOGY

After reading paradigmatic authors in the field of language, as diverse as the classic Ferdinand de Saussure [2], in his general linguistics course, Adam Schaff [5], in the typology of signs, Max Black [6], Roman Jakobson and Morris Halle [7], with regard to the functions of language, and to remember the orders of the same, stopping us in the syntactic and in the semantic, we go to review articles and monographs, the work on the Formal Language of Ibarra [3] and Balari [4], we dare to propose some modifications in the contents of the subject Language and Communication, or Language and Writing common or generalized forms as they are known in the university curricular field.

We try to promote conversations with teachers of subjects that basic are not elementary, but essential, since without their mastery any knowledge would be precarious in its assimilation.

These Basic Routine Instruments (IRs) are the LANGUAGES with which mental ideas or thinking are translated into oral or written speech or rigorous codes of strict denotative functionality. Both uses, even when the oral Speech opens up more connotative or creative possibilities in the immediate, are the matrix of communication, and the social reason that justifies its existence and permanent development, and plural, in its contents, which does not reduce its relation Space - Temporal (RET) to the individual capacity to freely manifest their objective or subjective needs for communication, since it also guarantees the development of collective communication and satisfaction, to a greater or lesser degree, depending on the historical, political and economic reality of The social demands. Approaching these two “languages” would lead to an increase in the number of hours spent in the “language teaching”, and to rethinking their contents and teaching strategies, for this we would propose in a first stage (E1):

- Conduct preliminary meetings with the academic authorities in each higher education institution, together with the professors of the chair to present the ideas expressed.
- Hold meetings with teachers from other professors, highlighting the use of formal languages, exchanging opinions and unifying criteria that could be moved from one chair to another, or modify them for redundancy, or unify strategies and resources .
- Organize seminars and workshops involving lecturers such as Language, Algebra, Calculus, Mathematics, and other UCEs whose contents or nature are conducive to the proposal (IR, RET ...).
- And a second stage (E2E), which we could call Experimental (E2E), which would begin with the designation of its members:
- Chairs of the chairs involved in the development of the experience, given the partial affinity of the programmatic contents.
- Teachers who would develop the modalities approved by the commission and accepted by the relevant levels of command.
- Advisors appointed by the authorities, in particular those related to the curricular area and the Academic Vice-rectorate.

In both stages the content would be modified maintaining affinity to the grammatical aspects, like the morphology and the syntax, the phonic and the semantic thing; The denotative and the connotative. The linguistic

sign, but introducing symbols and signals as fundamental signs in the Satellite Era, in which electronics, information technology, telematics, robotics, aeronautics, military advances, telephony, and TV, affect Social development and scientific and technological progress in general.

In the academic world there is concern about the way in which the language is maltreated by the social sectors, or individual, with little school participation; To students and graduates of higher education, and, in many cases, graduates in Social Communication. We see, for example, how the terms Novel-Nobel, Hóstil-Hostil, Futil-Futil, Interval-Interval, Deism, Dequeismo are used with indiscriminate recurrence. And how dialectical variations and barbarisms break the syntax and Correct pronunciation, without regard to the principle of adequacy inherent to the Speech, that is, to the use of the Language.

We have also seen, as behavioral reproducers of unavoidable presence in the mass media, violently break any protocol, disregarding the importance of proxemic and aesthetic codes, so delicate in events of official, political, religious, sporting or other we will be taught by Frenchman Pierre Guiraud [8], [9], [10]. Imagine that aeronautical, or medical, or police symbols or signals were ignored at some point by those who are temporarily or permanently located in those universes.

4. CONCLUSION

Each word depends on its semantic group, not only in its synchronous functioning of the system (Saussure), but in the appearance of change, and, conversely, semantic groups are rearranged with innovations. It is worth emphasizing this phrase of *Betrachtungen* [2, p.15]: The fate of words, their flowering and proliferation, their progressive extinction and their death, the way other words replace them, everything is largely conditioned by the way they are within their outline or environment.

Clear that these codes act simultaneously with the linguistic signs, which form the syntagms capable of rationalizing the thought, which derives in actions related to time (RET), logic, mathematics, physics, chemistry, laws, the micro and the macro society where we develop the existence. All of the above serves as support to build a LANGUAGE program project. We cannot fail to express a dream for which we will be able to fight for a lifetime: that LANGUAGE is a permanent chair throughout the scientific or humanistic careers of all the universities of the world.

We believe that it is a mistake to grant autonomy to formal languages to such an extent that they cannot be included in traditional signic typologies, by a supposed lack of grammars such as natural languages or linguistic or verbal languages. Saussure with his notes on meaning and signifier, and Chomsky with transformational grammar and his concepts on weak and strong generative capacities, in the second half of the twentieth century, and the conceptual collection in his attempt to form a theoretical body that by giving Characters proper to the languages derived from the changes and scientific and technological advances, as Ibarra, from Mexico, in his essays on 'Types of Formal Languages', have not promoted what we call the Formal Languages of the Satellite Age, which Are useful as IR for the development of novel technologies, but they have always existed as symbols and signs that act on the THINKING (language) in almost simultaneous travel that goes from the particular to the general and vice versa.

We could say something that, outside the context of this discourse, would be a truism, but it serves the purpose of keeping both languages within the same universe, or a communicational necessity: Formal Languages are IR (Routine Instruments) of science And the technology whose use it intends, and manages to synthesize in a RET (Space - Temporal Relationship) the thought, the discourse, the philosophy, that guide the development of the existence of humanity, in all its relations or contextualities.

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