

## THE NET CONCEPT ON MATHEMATICS EDUCATION

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### Abstract.

The present work is about a new idea of didactics methodology on the Mathematics Education. In our countries there is a deepest crisis in Education of students, teachers and professors in Mathematics Area. The reason is the social injustice by the different social conditions of life.

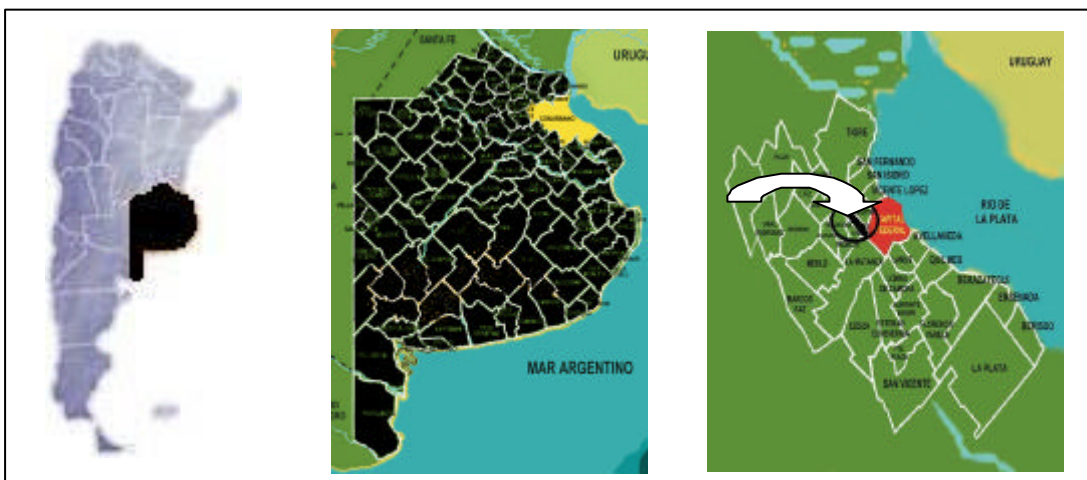
Our simple idea is based on the collective mechanism of capacitating, with the opened participation of the whole group of teachers and professors concerned in all the different education levels. The old traditional and individualist solution for this crisis is dead.

For the new concept is necessary to consider these next characteristics: social, labor, different schools, a weak public education, a poor informatics resources and other features. Our purpose is to develop a strong communication way with the simple, collective, democratic, free and general access to every teacher's group of all levels on Mathematics Education.

### 1. Introduction.

#### 1.1 Geographical location.

The National University of Tres de Febrero, UNTREF, is located in the District of February Three, Province of Buenos Aires. In the following graph and in the table 1 are detailed the geographical location with District's population data.



**Table 1** - Total Population of the district in relation to the total of the province., projected at June 30 the 2000

Jurisdiction	Population total	
	Abs.	%
<b>Total Province</b>	14.304.380	100
<b>Tres de Febrero</b>	353.355	2,4

In the table 2, we detail the careers that are dictated in the UNTREF with the relative percentages of students by career.

**Table 2** - Students population for career in relation to the total of the University. (On a total of approximately 2000 students)

CAREER	%
Administration of Companies	38
Public Administration	4
Education Sciences	13
Infirmary	10
Statistic	3
Geography	5
Art and the Culture Administration	4
School Administration	6
History	10
Commercial Relations	8

The current situation of the educational system in general and of the District in particular is poor and precarious. The table 3 shows us the maximum education level reached by the population of the District, to the year 1991.

**Table 3 - Maximum education level reached by the population of the District. Year 1991.**

Jurisdiction	Educational Population (*)	Maximum level of education reached%							
		Prim incom	Prim comp	Half incom	Half comp	Third incom	Third comp	Univ incom	Univ comp
<b>Total Province</b>	7.850.033	19,7	43,0	15,4	13,3	1,1	3,0	1,8	2,7
<b>Tres de Febrero</b>	231.468	15,0	42,0	17,2	16,6	1,4	3,3	2,1	2,3

(\*) People who eventually finished or not their studies.

### 1.2 Antecedents.

In the year 1884 our parliament promulgated the Law of Common Education N° 1.420 with the “General Principles on the public teaching in the primary schools” title, dictated as supreme Law of the Nation for the whole Republic without exception some and establishing that “*the authorities of each provinces are forced to conform to her, nevertheless any disposition in contrary that contain the laws or provincial Constitutions*” (Art. 31). In that way, it fixed the principles and norms that should be applied to the whole Argentine territory from 1884 and that the provinces should respect. According to those principles and norms “*the primary instruction should be obligatory, gratuitous, gradual and given according to the precepts of hygiene*”... “*to all children of 6 to 14 years of age*” at that moment, it already located us among the countries with more advanced legislation in the matter, when only the 15% of the children between that ages attended the school. Even more, the state made parents pay penalties when their children were not sent to school, and could even force them to make it appealing to the public force.

The second level education plans at the end of the XIX century were guided to the general and preparatory instruction for the university. Since 1890 was settled down that general instruction, that would capacitate for the access to the trade or industry careers, were taught by the national school, that dictated a professional teaching -although preparatory and rudimentary teaching- in the arts and industries.

During the presidency of D.F. Sarmiento administration (1868-1874) the general instruction in the second level educational institutes, was supplemented with a regional teaching, and some provinces added mining agronomy, right and trade courses.

By the middle of the XX century they incorporated to the system the technical schools, very differentiated from the other ones. These establishments had for object the formation of technicians in different industrial areas that managed their occupation without necessity of going by the superior studies. At the same time, the plans of study of the national and normal schools were modified, adapting them to the demands of a modern teaching.

In the 60's and principles of 70's the education in Argentina was one of the most important social achievements in our country. In theory, anyone had the right to access -from Pre-school to University - a gratuitous and a quality education. That situation notably contrasted with Latin American and other countries, that didn't possess such a widespread and systematic educational system as ours.

The education was such an important social achievement that it had, the prestige and the acceptance of all our society. It was considered as a true social value and, such as, a "personal value" with which our inhabitants not only could improve their quality of life and their integration to the productive forces, but also to consent to different environments of institutional power. It was possible that the students coming from the hard-working sectors of our society could obtain an education of quality and the easiest way to get social mobility and their feedback.

From the point of view of the teaching and learning of Sciences in general and of the Mathematical one in particular, it is not casual that their teaching has enjoyed the general quality. In the middle of industrial development our country needed especially that preparation to continue satisfying the industrial necessities of then. The educational system worked; had errors but it generated the aptitudes and necessary knowledge for a country -clerk and certainly with social inequalities - but in economic and industrial expansion.

In 1976 the country suffered an institutional crisis of historical proportions. In March of that year, a military coup interrupted -with the support of our population's sectors - the democratic life of the Republic.. The armed forces, under the euphemism of generating a "process of national reorganization" - justified ideologically in the fight against the subversion, the terrorism and the communism- they took the power and they intervened the powers executive, legislative and judicial. In the period of the '76 at the '83, to the help of the emptying of the country of their impoverishment and of the tremendous transfer of wealth, it was established, institutionally, the " neoliberalism " in Argentina and the education of that time reproduced the devastating consequences of the new prevailing system.

Although the beginning of the crisis of the educational system could had been imagined before to the military blow of March of the '76, this took it to away never seen before: were prohibited and burned books, it was pursued and discharged to professors of all the levels, investigators and professors disappeared physically; the universities were flattened with the rising fall of the academic level and of investigation.

In that time and amid the vertiginous increase of the Argentinean foreign debt, the blow of grace was given to the basic education starting from the process of decentralization that would continue being deepened with the later democratic governments.

It is important to observe that the decentralization of the educational system in our country had its biggest impulse with the installation of the "neoliberal" pattern and the separation of the state, while that same ideology produced a deepened of the centralizing classification of the superior educational system. Besides the intervention to the universities the action of the Council of Rectors of National Universities was revitalized, and the rectors designated by the military régime participated in the introduction of mechanisms for the selective admission of the superior studies.

In 1983, it ascended to the elected power in the urns, R. Alfonsín's government who governed up to 1989. In the same way, C. Menem who showed the power during ten years, up to 1999. During both governments the demand for education grew in the country giving a new impulse to a process that had begun previously.

At the present time, the Argentinean society is more and more broken into fragments and the education reproduces that fragmentation. In the specific case of the mathematical education, this has become a "social weapon" that selects people. Many students abandon their university studies after failing in their intents of reaching the demands outlined in the development of their careers. In that sense, students infinity deserts for not being able to apprehend the contents of mathematical that the system requires that they know. It is very common to listen the students to say that certain knowledge are outside of their reach, of their understanding, and it is also common to observe that they don't take appropriate measures, from the institutions and corresponding organisms, in spite of the educational transformation propitiated starting from the Federal Law of Education of 1995 and of the importance granted by this to the contained discipliners.

In this context of difficulties in the learning process and teaching of the mathematical are, the necessity arises in our university of studying the problem, beginning an investigation on Mathematical Education and its linking with the Basic Educational System.

## **2. Program of Collective Action: the Concept of Net.**

The concept of Net supposes to recover the teacher's vocation that naturally it was given or it was inherent to the person that dedicated their life to teach in passed decades. They are still teachers with such attributes. However, the strong spoliating pressure that is exercised on our society takes, in gradual form, to the depression and the discouragement. Everything increased it with the growing individualism that has won to our societies and in particular to unprotected countries like ours. Of this terminal crisis it is only possible to leave among everyone us. For that reason, the concept of Net should be applied in consent so that all the educational ones know what to teach and how, feeling part leaves of a strong, collective and participative structure that it supports its action in the classroom. To finish with the isolation, confusion, disorientation or intellectual inability of a solitary action in the classroom, it becomes indispensable to have a collective back, integrated by real and willing people to surrender in form cooperative: successful experiences, production of didactic material, exchange of ideas, design of practical classes or of investigation, guides of works for the classroom, extracurricular and interdisciplinary program of activities and all opinion form or action that it converges to develop the interest of the students for the mathematical knowledge.

On the other hand, this net methodology would help to generate a collective movement that understands the necessity not to abandon the educational task especially in the regions far from Buenos Aires, as our District, where the school has only the function of social contention and of feeding, in the cases of extreme necessity.

### **2.1. What to teach?.**

In Mathematical Education we observe that there is more than enough contents starting from those which to generate a learning, according to that waited by the educational authorities. However, to find answers to the query they are distinguished two big difficulties.

#### **2.1.1. Ignorance of the contents in the first cycles of the EGB 1 and 2.**

It is observed like a primordial task to qualify the mathematical educators of the first 6 years of Basic Mathematical Education in EGB1 and EGB2.

The factors that take to the ignorance of the contents in those teaching levels on the part of the teachers were detailed in the Introduction (to See 1.2).

In the design of the current programs of educational training in march (Formative Itineraries organized by the Government of the Province of Buenos Aires) special care should be had in correcting this difficulty.

#### **2.1.2. Selection of Contents.**

For the superior levels of basic teaching, EGB3 and Polimodal, it becomes indispensable to select among all the participants of the Net the good program and realistic to be completed and that it serves as base for the whole future mathematical activity.

#### **2.1.3. Strong training.**

The two levels of difficulty mentioned in 2.1.1 and 2.1.2 can be solved with a program of strong training in contents, previous consultation of the opinion of the educational ones who you/they would describe their difficulties in anonymous form. The consultation should be impelled by the educational authorities.

With such organization, the Formative Itineraries would keep in mind the lacks of the educational ones and the flaws of formation and/or information to qualify them in it to discipline. Such Formative Itineraries should take place like final work, didactic material to be used in the classroom.

### **2.2. How to teach?.**

The Concept of Net should cover such aspects as:

- Coordination among the educational ones of Mathematical of all teaching levels.

- Days of Reflection has more than enough combined activities to increase the covering of the Net.
- Definition of the communication channel and more effective exchange for the work of the educational net.
- To agree the most effective and appropriate selection of contents among the educators of mathematical, overalls in EGB3 and Polimodal.
- To Define methodological strategies that reinforce the learning.
- To Implement activities that improve the learning.
- To Articulate among the different teaching levels.
- Utilization of the Educational Technology.
- To Rescue practical of the teaching based on the Geometry, the History of Mathematics and the Etnomathematic.
- To Select investigation topics starting from the interest of the students.

### **3. Conclusions.**

#### **3.1 General conclusion.**

The generation of a Regional Educational Net among the educational ones of Mathematical should assure a new form of didactic methodology where all in consent decide what and how to teach through a collective, democratic, gratuitous, participative, talkative, interactive, of collaboration, exchange and general access, mechanism.

#### **3.2 Particular Conclusions.**

##### **A) Educational training.**

- Should be consulted the necessities of the educational ones of all the levels.
- According to the necessities, a program of permanent training will be defined from the initial education until the polimodal.
- In the training program should be included an evaluation mechanism and autoevaluación so that the trainings assure same educational qualities and have the commitment of the educational ones.
- Should be directed prioritarily at EGB1 and 2, of more necessities and there to emphasize the interdisciplinary work.
- To Deepen the disciplinarity in EGB3 and Polimodal.
- To Increase and to assure the diffusion of the training offers so that it arrives to all the educational ones.
- To Return to the professors the results and the initiatives to improve the collective action of the educational ones.
- To Implement the communication mechanisms among Headquarters, Supervisors, University, Unions, Community and educational Associations for a collective common action and participative.

##### **B) Basic minimum contents:**

- to avoid "the thematic fashions" regarding the selection of contents.

The selection of contents should be:

- agreeded in the net to give answers to such questions as: " will I be teaching correctly"? or when I teach, do I give more importance to the contents or to develop the capacity to reason?"
- Coherent with the definition of the treatment of the topics and didactic strategies.
- Coherent with the bibliographical selection and the didactic materials of educational support.
- Distributed in the different teaching levels according to a program that it contemplates common areas of contents among years of the same level cycle of EGB and among the different levels.

##### **C) Articulation:**

- should integrate every year with the following one and each level with the superior level.
- should be defined common thematic areas to pass from one year or level to the following one. It ends and you begins with the same selected contents. This didactic methodology assures an agreeded collective strategy among the different educational levels starting from the commitment of general participation.
- The selection of contents with the articulation is not an individual commitment but a commitment of all.