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Models And Curricula In Chemistry

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----------ABSTRACT----------
Education employs and has used models to describe the process of teaching and learning. The same curriculum of the professions are not but models with them we intend to train professionals in accordance with the requirements of the society and the state of science and technology. These models can and must be changed from time to time to suit the needs of society and the institution.

KEYWORDS: *chemistry, curriculum, models*

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I. INTRODUCTION

The universe is vast,the real world is complicated. We must define our object of study.When the scientist, engineer, chemist, biologist, or any other professional wants to study something hemust set limits, define the problem, i.e. studying part of the universe. That part can be as large as a Galaxy or as small as an atom. Simplify is the word, even that part of the universe that you want to study you should simplify.How can we study and understand something so formidably complex as the biosphere or a tropical rainforest or a climate? We necessarily have to use simplifications that take into account only the most important and basic properties. These simplified versions of reality are called models.

A model : Models have been described in many ways, but the most common is: that a model is a representations that are used to describe, explain or predict Van Driel, 1990 [1], Gilbert ,2004 [2] describes the models as simplified descriptions of an observed reality and which are built for specific purposes, in that a theory is applied, therefore are idealizations of a possible reality, visualization of an abstract phenomenon of something: either very large or very small to be noted or simplification of something very complex, so they can sit the scientific basis to explain and predict the phenomenon.

Types of models : A model can be as simple as an explanation with words of the fundamental of a reality. This type is commonly called conjugation model. In other models, we use diagrams that are drawn in a simplified way ofthe components of a system with arrows pointing the actions of some over others. They are graphical models. Some can be very schematic, but when each arrow indicates the type of action that takes place and are designated to different compartments and types of interaction, can become very complicated. In numerical models figures and mathematical equations are used to describe accurately the various components of the system and the relationships between them. The development of computers has made it possible to handle a large amount of data and therefore now people used increasingly, computational models, in which computer programs imitated the functioning of complex systems. These models are the most sophisticated and have allowed simulate relatively very complicated processes such as, the functioning of the atmosphere or the fluctuations of stocks, among many others. Thanks to them we have made important progress as, for example, reliable predictions of the weather.

Usefulness and limitations of the models : A good model allows to predict future situations because, as it mimics the reality, it gives the possibility to come to the present and placed in what is to come. Another advantage of models is that they allow to do "experiments" that would never be possible in reality. For example: if you have a good model for the functioning of the atmosphere,one can predict what would happen if you increase the concentration of a gas, e.g. CO_2, and see how the temperature will vary. The obvious limitation is that a model mimics, but isn't reality. Good that is always far from the complexity of the natural process.

Scientific method : Current models are built using the so-called scientific method. The scientific method allows to model.In all branches of science, including of course the physics, chemistry and biology we use models to

represent our ideas of how a certain part of the universe will behave. The representation may be conceptual (e.g. an equation) or may be material (for example, a model or a map). Scientific models have allowed the representation of physical structures or chemical such as: solar system, lunar phases, chemical reactions, DNA, physical states, liquid, gas and solid, etc..

II. MODELS IN TEACHING

Teaching models are used to explain ideas about the teaching-learning process. Philosophers and educators have used these models or theories to explain the importance of education, which is expected of it, how you must educate yourself or a nation, and how we should measure learning. These models have been influenced by politics, religion, economics, psychology and of course the teaching ideas in fashion.A teaching model is a structured plan that can be used to set up a curriculum, to design teaching materials and to orient the teaching in the classroom. Suárez, 1994[3].Education models vary according to the historical period in which appear and are valid, in the degree of complexity, in the type and number of parts that present as well as the emphasis by the authors in some of the components or the relations of its elements. Knowledge of educational models allows teachers to have an overview of how programmes are made, how they operate and what are the elements that play a key role in a programme or a didactic planning. The knowledge that you have programs and their parts shall be conclusive that teachers develop efficient didactic planning and obtain better results in the classroom.Education and models, 2012[4].All educational model requires great clarity on the concept of education which shall remain in force and that from a general point of view can be summed up in three

approaches:

Educationunderstood as preparation for the world of mostly economic needs.

This type of educationenables the subject to make it perform adequately in the society that lives. This can be identified as a technocratic approach since it technifies or professional individual.

Education seen as playing skills or knowledge that society considers important

In this type of teaching the emphasis is intellectual. In such an approach people are interested in the subject to learn, more and better what directed you.

Education considered as the formation of a subject.

In this approach favors the formation of the subject so the teachers trained him to understand, and transform itself and the society in which it is registered. Educational model, 2012[4].

III. THE CURRICULUM OF A PROFESSION

In formal education, a curriculum is the set of courses, and the content offered by a school or anuniversity. A curriculum is mandatory and is based on a content of requirements that specify which topics must be understood or handled and what should be the level achieved so as to obtain a level or degree of studies in particular. The curriculum indicate the prescribed courses that students must take to obtain a certain level of education and a diploma, for example the chemical engineer, which shows it to society and to prepare the student for professional life after leaving university. The curricula of a careerarealso models. They summarized the ideas and concepts that have functions which should cover a professional. Based on these preconceptions are assigned a series of materials and a sequence which can ideally be the chemical engineer wanted by the society and in accordance with the time. These curricula should be updated from time to time, since the demands of the society change with the passage of time, the change in governmental institutions and scientific and technological development of societies.

In our days the curricula of the chemistry-related careers have a curriculum that begins with a strong emphasis on basic sciences, chemistry, physics, mathematics, and engineering sciences. The top level of the curriculum is based on these fundamentals to impart basic knowledge and application of phenomena of transport, thermodynamics, catalysis, kinetic processes, control processes and processes assisted by computer, biotechnology, analytical chemistry, etc. In addition, emphasis is placed on the economic aspect and the social implications of chemistry to improve the awareness of social responsibility.Curriculum, Wikipedia, 2012[5] .

The chemistry-related careers curricula currently adopt an educational model centered on learning, a model that enhances the participation of the student in the learning process. The professor adopts a role of facilitator and guider of the educational process; in addition, strategically selected courses offer academic advising that contribute to improve the academic achievement of the students. The curriculum is made up of theoretical courses that dealt with the different thematic contents that contribute to the formation of future professionals,

and workshops where students learn to manipulate equipment and instruments, which serve to test fundamental laws of the discipline and to develop the skills that requires graduates of these studies.Of agreement the model curriculum consists of the following elements: the profile of the graduate, the curricular structure and the subjects. To prove it, the student must meet the requirements for entry, residence requirements and cover the entire of its curriculum credits. In addition to the above, for the purposes of qualification, the corresponding graduation requirements must be covered.

IV. CONCLUSIONS

If the curricula are a model and work as such, they can be used to simulate and predict the performance of the future professionals of the chemical. The problem with teaching models is that the experimental results of applying that model are seen after a long time. In the case of the career of chemistry curricula most require students to pass between 8 to 10 semesters so that it can obtain the title, leaving the institution and begin working in the industrial sector. There you should at least spend another 5 years so that the impact of your training can see in industry and in society.One of the problems that the designers of curricula have is the large number of fields of study that can impart. Each day, there are more disciplines that would be desirable to incorporate into the curriculum, but there must be a limit, this is given by the limitation in time of the studies on the other hand by the subjects that are considered to be indispensable as a basis for the solid training of the future professionals. In many countries the curricula are standardized, so that students who attend courses in different universities and cities of the country can move without losing semesters from an institution to another, repeating their studies. In the European Community, that applies to the institutions of all the nations that are part of that block, so they can be attend courses in different countries, which are equivalent because the states have reached agreement on a unique curriculum for a given profession. In those countries the emphasis towards globalization and standardization is clear.

In the United States and in Mexico, the situation is different, each institution designed his own curriculum according to what has the career committee had approved. This has produced a variety of curricula, with the consequence that it is very difficult for the studentsto go from an institution to another or to revalidate completely its materials. Also, it is the case that some institutions calls for a thesis so that the students get their graduate diploma, while in others, this is not a requirement. The diversity of curricula has led to the universities and technological orient plans toward specific topics in order to differentiate its graduates of the others. Thus, in Mexico, there are institutions that have guided the curriculum of the career towards administration, project engineering, chemistry or computer-aided engineering, petrochemical, environmental control, or the agrochemical, food chemistry. In these countries the emphasis is towards specialization and regionalization. Curriculum, UNAL, 2012[6].

Personally I think that the design of the curriculum must not be made in the fashions or the current demands of the industry requirements, but on the basis of what you require or what you would want to make of the future professionals in 10 or 15 years, when graduates of the new plan would be active. I also think that it would be very convenient for a country, like Mexico, that curricula are homogeneous to thus economize resources and facilitate the transfer of students and teachers from an institution to another. In addition, such a move would raise the quality of the teaching of chemistry in the country.Curriculum indicates the competences in the field of knowledge, skills, values and attitudes which must possess a professional at the end of their studies. However, the main emphasis should be on the skills, values and attitudes, since these will remain longer than the knowledge that today are changing at an ever increasing pace.Today, with speed that changes are conducted in sciences and technologies is difficult to develop a curriculum that is in effect for more than a decade, so the developers of curricula must be very careful to introduce changes that may affect a generation of students and professionals.

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