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ARGENTINA

THE ARGENTINE PROJECT ON EDUCATION AND THE CHEMICAL WEAPONS CONVENTION

1. Introduction

In 2010 the Argentine National Authority launched a number of activities as part of the next stage in the implementation of the obligations of the Chemical Weapons Convention (the Convention) in Argentina.

Among the different actions that were implemented, a Working Group was established to work on outreach and dissemination of the obligations under the Convention and the national legislation that implements it. The Group included members of the National Authority and representatives of several Ministries, research institutes, professional associations and chambers of the chemical industry.

A new outreach campaign conducted in 2011 and 2012 led to the detection of a large number of companies that were not registered with the National Authority. In parallel, during several inspections to declared sites, the National Authority noticed that plant and production managers, as well as other senior staff, had an incorrect or incomplete understanding of the technicalities related to the provisions of the Convention and the national implementation norms - despite most of them holding degrees in chemical engineering, chemistry or biochemistry. They acknowledged that they had not received adequate information during their university studies about the national legal requirements and obligations of the Convention.

This showed that the information campaign that had been run by the National Authority for the private sector was not enough, and that other ways had to be devised to improve the level of technical knowledge by the students of chemistry, chemical engineering and other related careers who would eventually work as executives, managers and senior staff in declared plants.

Therefore, the National Authority requested the Working Group on outreach to consider the issue of education as another way to promote the proper implementation of the obligations of the Convention in Argentina. The Working Group invited representatives of universities and research institutes to work on this matter, taking into account the recommendations of the Advisory Panel on Future Priorities of the OPCW and of the Scientific Advisory Board of the OPCW.



2. The challenge of education and the Convention

The Argentine chemical industry plays an important role in the development of the national economy and contributes to the scientific and technological progress of the country. Professionals from these areas of knowledge, who hold university degrees contribute, through their academic training, to the progress of the chemical industry in Argentina.

Technological developments generate legal responses – any scientific or technological innovation is matched by regulations that the legal system develops to solve or reduce the potential risks generated by the innovations. Therefore, science and law, particularly international law, must be understood in a complementary manner to produce the linkage required by the international society.

New technologies are changing the social, economic and political organisations in all countries. In response to the globalisation and social transformation, fragmentation and affirmation of differences increases. This transformation inexorably has an impact in the realms of science and the law. While science and technology optimise the quality of life and accelerate the responses to the societies' needs, they can also cause unwanted side effects that can harm the society – in some cases with severe consequences, affecting the free development of citizens. In this situation, science and the law must deliver a correct answer, channelling such activities in a way that people are not affected.

Toxic chemicals constitute one of the scientific and technological areas that pose major challenges, because of the scope and potential effects, especially those that can be used as chemical weapons. These negative side-effects justify the implementation of legal mechanisms to protect the people and society, as does the Convention.

3. The Argentine university system

Under these considerations, the Working Group on Outreach analysed the Argentine university system, including legislation courses taught at graduate careers that have a direct relation with the obligations of the Convention.

The Argentine university system consists of 117 institutions, of which 57 are public and 60 are privately run. Each university has several faculties, providing undergraduate, graduate and postgraduate courses in different specialties. Graduate courses seek to train future professionals in any branch of science. In some cases, such as in medicine, architecture, chemistry or law, it is mandatory to have a university degree in order to practice that profession.

The university system has an autonomous status, as each university decides on its careers and courses, and sets its own study programmes and curricula. But for the accreditation of graduate courses, Argentina's law requires that the professions regulated by the State – those whose incorrect exercise could compromise the public interest by directly putting at risk the health, safety, rights, property or the development of its citizens - must comply with guidelines regarding the minimum course load, adhere to a set of basic curricula content, and to a specific criteria about the intensity of the practical training. The objective of these regulations is to improve the teaching and ensure a minimum quality of the professional services.

The university accreditation system is mixed. While the standards are established by the Ministry of Education, they are based on proposals made by the universities themselves and the professional associations. The evaluation is based on the objectives set by the universities themselves. The standards target the minimum content of each career, and each university can incorporate additional contents. At the end of the accreditation process, graduate courses can be accredited for 3 or 6 years. After that, an improvement plan for future development is designed for each university. The Ministry of Education supports the universities to develop and implement the improvement plans.

According to a report issued in 2011 by the Ministry of Education, the Argentine universities that grant graduate degrees in Chemical Sciences and Engineering are distributed as follows:

- (a) There are 39 state-run universities and 5 private universities that have graduate careers in chemical sciences. The degrees granted by these universities are: Graduate in Chemical Sciences, Graduate in Industrial Chemistry, Graduate in Chemistry, Professor of Chemistry, Professor of Higher Education in Chemistry, Doctor in Chemical Sciences, Doctor in Industrial Chemistry, Doctor in Chemistry, and Master in Chemistry.
- (b) There are 54 state-run universities and 14 private universities that have engineering graduate careers. The degrees granted by these universities are: Industrial Engineer, Chemical Engineer, Doctor in Engineering, Magister in Engineering, Doctor in Chemical Engineering, Doctor in Exact Sciences and Engineering, and Doctor in Engineering Science.

An analysis by the Working Group of the curricular study-plans of some of these careers showed that, while the scientific and technical teaching and training that the future professionals get at universities in Argentina is solid and consistent, there is a great lack of understanding of the dual nature of the use of knowledge in the chemical sciences and of the risks involved.

A similar situation was observed in the area of science and technology, where scientists conducting both basic and applied research related to science and chemical engineering, are not very aware, not only of the dual nature of the use of these sciences, but also of the role of the Convention and the national legislation that implements it.

Based on this study the Working Group concluded that the majority of graduate courses in chemistry, chemical engineering, biochemistry, pharmacy, and environmental and industrial safety taught at both public and private universities in Argentina, did not include the teaching of national laws and regulations that implemented the obligations of the Convention in Argentina.

Therefore, the Group proposed that the National Authority implement a project, in collaboration with the Ministry of Education, to promote the inclusion of specific courses in the curricula of these graduate careers.

4. Agreement between the National Authority and the Ministry of Education

During its discussions, the Working Group considered that the subject was too important to be circumscribed to only providing a better understanding of the obligations of the

Convention to future plant or production managers of declarable facilities. The Group therefore proposed a broader scope for the project, in order to promote a culture, among all professionals in the chemical fields, on the responsible use of technical and scientific knowledge, in order to be aware of the potential danger and to prevent all misuse and abuse of chemicals. It was proposed that the project should also include practicing chemists, research scientists and university laboratory professionals. The group also considered that, at a second stage, the project should be targeted to secondary education students.

The National Authority agreed with all recommendations of the Working Group and decided to launch a national project to implement them. Taking into account the federal nature of the Argentine university system, the National Authority sought and got the support of the Ministry of Education. As a result, they agreed to work together and signed a Memorandum of Strategic Cooperation, which established the goals and actions to implement a “National Project on Education on the Responsible and Secure Use of the Chemical Sciences and Technologies for the Scientific, Economical and Social Development of the Argentine Republic”.

In May 2013, the National Authority and the Ministry of Education convened a national meeting to launch the project, which was attended by deans and heads of studies from over 50 universities. All participants welcomed the initiative and recognised the need to include the teaching of the national norms relevant to the Convention in their respective graduate studies. However, as most career curricula were already crowded with regular courses, it was decided to leave it up to each university to decide how to include the new course materials. It was proposed that, when changing the curricula was not possible or desirable, alternative educational tools should be devised to introduce the new materials, such as workshops, seminars, optional courses, special assignments, or their incorporation into existing courses.

In this context, the Ministry of Education has recently included, in its improvement programme for chemistry careers, a specific and mandatory component on the Convention obligations and its national legislation. The new component is a requirement for those universities that, having received the certification of their chemistry careers, intend to apply for funding support from the Ministry of Education. It is intended to include similar components as requirements in the improvement programmes of other relevant graduate careers, such as chemical engineering. The Ministry of Education has allocated funds to support universities’ activities in the implementation of these components.

The Memorandum of Strategic Cooperation includes the following actions to implement the project:

- (a) The establishment of a network of participating universities, coordinated by the Ministry of Education and the National Authority, to help deans and heads of studies share their experiences, needs and recommendations on how to implement the project in their respective graduate careers.
- (b) The development of relevant course material to cover the Convention obligations and national legislation to be used by the participant universities.
- (c) The planning and running of a “training the trainers” programme for faculty members of participating universities, in particular targeted to chemistry professors.

- (d) The development and implementation of a model virtual classroom, for those universities without trained faculty members
- (e) The establishment of a “travelling class”, for those universities without trained faculty members and with no access to the virtual classroom.
- (f) Specific universities were appointed as coordinators of each course of action, in order to provide a sense of “ownership” of the initiatives. All activities in the project are implemented on a voluntary basis by participating universities.

5. Ongoing activities

Since the launching of the first stage of the project in July 2013, the following actions have been implemented:

The Forum of Deans of Chemistry Careers (FODEQUI) has established a network among its university members, in order to pool the knowledge and resources to implement the project. Among others, it aims to achieve that: teachers are trained to transmit to their students a culture of responsibility in the use of chemical knowledge; that students are aware of the importance of their actions and decisions as professionals in the field of chemistry, and to encourage teachers and students alike to investigate on the problems they would face, both from a legal and disciplinary point of view. Among the activities planned by the universities within the FODEQUI are: the use of well-established experts in this field for training the faculty; the development and exchange of educational materials; the theoretical and practical training of students through virtual classrooms, and the purchase of equipment to enable professors and students to perform simulations of possible chemical accidents.

Other Forums of Deans with related careers, such as the National University Council of Natural and Exact Sciences Careers (CUCEN), the Federal Council of Deans Engineering Careers (CONFEDI) and the University Association for Agricultural Education (AUDEAS), are considering the establishment of similar networks. The National Authority and the Ministry of Education will sign a Framework Agreement with these Councils and Associations in order to create a network of networks to facilitate the coordination of all activities related to the project.

Separately, the first stage of the training the trainers programme was launched, coordinated by the National University of Rosario. The National Authority co-sponsored the First Workshop on "Chemistry for Peace: Ethical Training and Professional Responsibility in Education", organised by the School of Biochemical and Pharmaceutical Sciences of the National University of Rosario, with the support of the OPCW. The workshop was attended by 50 professors of graduate and post-graduate courses in chemical sciences, scientific researchers, professionals in the chemical industry, as well as officials and authorities of educational and scientific institutions related to chemistry. The goal of the workshop was to create a space for training, meeting and exchange of experiences, allowing for the joint development of proposals in education related to:

- (a) Consider the risks associated with the multiple uses of chemicals and the responsible use of scientific knowledge.
- (b) Contribute to the prevention of the misuse of toxic chemicals.

- (c) Promote safety and chemical protection.
- (d) Develop skills and abilities in relation to the peaceful uses of chemistry.
- (e) Raise awareness of the Convention among students, educators and the scientific community in general.
- (f) Build networks on chemical education.

The organisation of other training the trainers workshops for professors of chemistry, biochemistry and chemical engineering is being evaluated for the first semester of 2014.

The National Authority, the Ministry of Education and the Kennedy University began to design the modules and contents of the virtual classroom. A pilot test of the virtual class is expected to be run during the first semester of 2014, as modules in the “Toxicology and Legal Chemistry” and “Hygiene and Occupational Safety” courses of the graduate career in chemistry at the Kennedy University. The content and access to the virtual classroom will be available to all participating universities, upon the signing of a specific agreement with the National Authority, the Ministry of Education, and the Kennedy University.

Also, the National Authority, the Ministry of Education and the National University of Córdoba have begun to design the outline of the travelling class using the contents of the virtual classroom and other educational materials related to the topic. Professors and experts on the subject will be identified to integrate the travelling class. It is estimated that the first stage of the travelling class will be implemented, for a specific region that includes several universities, during the second semester of 2014.

In parallel, several universities have already begun to organise seminars and workshops on the project, which were attended by a significant number of students and professors. Among others:

- (a) A seminar on education on the responsible use of chemical knowledge, organised by the National University of Litoral (Santa Fé). About 200 students and professors of chemistry, biochemistry and biotechnology careers attended the seminar, as well as students of technical secondary institutes. A panel of professors and researchers, as well as the Executive Chairman of the National Authority, discussed the matters of the responsible use, the professional ethics and safety of scientific knowledge in the chemical fields.
- (b) A meeting of the National University Council (CIN) was organised to share information on the activities undertaken so far under the project and to develop strategies to be implemented in the future. It was attended by representatives from the Ministry of Education, the National Authority, the National University Council (CIN), the Council of Deans of Private Universities (CROUP), the National University Council of Natural and Exact Sciences Careers (CUCEN), the Federal Council of Deans of Engineering Careers (CONFEDI), the Forum of Deans of Chemistry Careers (FODEQUI) and the University Association for Agricultural Education (AUDEAS).

- (c) At the Annual Plenary Meeting of the Forum of Deans of Chemistry Careers (FODEQUI), the National Authority created a presentation to inform those deans not yet aware of the project, and to get their interest and participation.
- (d) The "XVI National Meeting of Chemistry Professors" organised by the Association of Chemistry Professors of Argentina (ADEQRA). It was attended by over 100 chemistry professors of both public and private universities across the country, who showed great interest in the project, particularly in the implementation of the training the trainers programme and the traveling class.
- (e) The "XVIII National Congress of Chemical Engineering Students", which was attended by more than 800 students from across the country. The National Authority explained the goals, scope and proposals of the project, receiving many questions and expressions of interest from the students.

Also, several universities with chemistry careers have already begun to implement curricular and extra-curricular activities related to the project, as part of the improvement programmes sponsored by the Ministry of Education. The National Authority has been invited to be a member of the panel that will evaluate the implementation of those programmes.

6. Indicators

On a preliminary basis it can be said that Argentine universities, professors and students have so far shown a great interest in the project. The National Authority and the Ministry of Education will use specific indicators to measure the implementation of the project and on the impact of its activities, both at the industry-level and at the overall society-level. The following indicators will be used:

- (a) Number of graduate careers that have incorporated "modules or other learning tools" about the project;
- (b) Number of universities that have organised workshops, seminars, etc.
- (c) Number of graduate careers that have accomplished the goals under the mandatory component on the project of the Strategic Improvement Programs;
- (d) Number of professors that have been trained;
- (e) Number of students who have participated in virtual classes;
- (f) Number of students who have participated in workshops, seminars and conferences related to the project.

Based on this evaluation, the Argentine government will present a national report on the implementation of its Project to the Nineteenth Session of the Conference of the States Parties in 2014.

7. Conclusions

The OPCW has been increasing its work on education and outreach in the last few years, and the Director-General has expressed his support for the Argentine project. In this regard, the

OPCW has contributed to the participation of international experts in the first training the trainers workshop in Argentina. Also, the Technical Secretariat has expressed its readiness to co-organise and support the organisation of the First Regional Meeting on Education and Outreach, to be held in Buenos Aires in April 2014. At that meeting, the Argentine National Authority intends to share the experience gained in implementing the national project with its Latin American and Caribbean counterparts.

National Authorities have a wider role to play in addition to the crucial one given to them by the Convention. They are uniquely positioned to engage and interact with all stakeholders, at the national and international levels, that have responsibilities, interests or obligations related to the use of toxic chemicals. When they work together, they produce synergies that help achieving the goal of the Convention: a world free of chemical weapons, where toxic chemicals and their related technologies and knowledge are used in a safe manner, exclusively for the benefit of mankind.

From this perspective, the National Authority of Argentina believes that its national project on education is a contribution to this goal and hopes that the experience gained in its implementation could be of use to other National Authorities.

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