

## **Teaching Proposal in Advanced Agronomy Students for Agricultural Environmental Management.**

C. Bonafina<sup>1</sup>, L. Marbán<sup>1</sup>, L Giuffré &<sup>1</sup>, E. Ciarlo<sup>1</sup>.

<sup>1</sup>Universidad de Buenos Aires. Facultad de Agronomía. Buenos Aires, Argentina.  
Corresponding Author: C. Bonafina

---

**Abstract:** The sustainable development approach in an agronomic career needs to have several tools for the sustainable management. For this reason, the subject Environmental Impact on Agrosystems, exclusive of the degree in Agronomic Engineering, in the Facultad de Agronomía of the Universidad de Buenos Aires allows us to provide several perspectives to the agricultural reality with a focus on the implications of working with natural resources in a social environment. The study aims are make students capable of contextualize the environmental implications of agricultural and agro-industrial productions and apply an environmental management tool to describe a real problem. The methodology chosen is a variation of problem-based learning. This teaching methodology focuses on the learning process and makes it possible to solve complex problems from multiple perspectives. The teaching work is divided in three instances: one for the theoretical explanation of the discipline, another for the explanation of the new model of evaluation and the last as a guide in spaces of reflexion and analysis of the written work and research, in addition to correction's spaces and feedback from periodic written examinations. This proposal has had better results than the traditional examination methodology in which the group of students were conducting their examinations of each discipline separately.

**Keywords:** Environmental Education, Environmental Conflicts – Natural Resource's Management

---

Date of Submission: 04-10-2019

Date of Acceptance: 21-10-2019

---

### **I. INTRODUCTION**

The agronomic engineering career has the challenge of producing food in a context of sustainable development. Its effects must not alter the natural or social environment that surrounds it. The right to a healthy environment, fit for human development is made explicit in our National Constitution. The provision of food assists the objective of zero hunger as it figures in Objectives 12 and 2 of the DS: objectives of sustainable development [1].

For this reason, after apprehension of knowledge of the effects on the environment of agricultural and agro-industrial activities, it is important that the future graduate of the Faculty of Agronomy of the UBA could manage how to apply the tools of environmental management to relieve the state of the situation in multiple contexts.

In the current curriculum this elective subject integrates with two credits the free axis of the three axes that the career has in its superior cycle, which is offered from fourth year [2].

Internal conditions that make the sequential structuring of the subject: classes twice a week with guest teachers who respond to three fundamental dimensions:

- Dimension of natural resources that is developed in the issues of Soil Pollution, Water Pollution, Environmental effect of industrial, urban and rural activity (effluents) and Phytotherapics (pesticides).
- Socio-economic aspects are focused in: Sociology, Economic Valuation and Legislation and Global Impact.
- Relationship between man and technology appears in: Hygiene and Safety at work and Ergonomics.

In the traditional context of the subject, difficulties were observed for the integration of the contents:

Multiple discourse modalities.

Loss of connecting thread.

Multiple evaluation

Practical workgroup (3 students) home examination for each class, with scheduled deliveries on a virtual platform. In that kind of work, it was observed multiple use of transcribed bibliographic sources, without self-reflection, no analysis, and incorrect use of citation rules. It was finally evident the application of a "ritual knowledge" used to fulfil the requirements of the tasks, lacking comprehension (Perkins 2001:36).

For the application of management tools, it was worked through a slogan distribution in groups of 6 members during the course and an oral exposition at the end of the course.

The methodology proposed to be used is partly framed in the framework of Learning Based on Problems that

allow to solve professional problems connecting to life focusing on the learning process and contributing to the collaborative work. The research modality to be used in this case will be shared between teachers and students [3].

Its elaboration will be mediated inside and outside the classroom so that the students inquire about the aspects seen in the subject from a real problem. The work to be carried out by the students consists in the investigation of a situation that has a focus on a current environmental conflict, derived from a conflict of interest (agricultural and/or agro-industrial production). This conflict can be extracted from news, experiences in university life and/or work situations.

## **II. OBJECTIVES**

The main objectives of the teaching proposal are:

1. Test an alternative of evaluation that assist the integration of the contents seen in the class and develop attitudes of critical analysis, reflection, listening and formation of consensus by the students.
2. Contextualize the environmental implications of agricultural and agro-industrial productions
3. Apply an environmental management tool for the description of a real problem.

This improve and develop skills for team-work and allows to apply an adequate analysis of the thematic perspectives as well as apply correctly criteria established in the form and writing in a written production.

## **III. DEVELOPMENT**

The teaching strategy chosen is a variant of problem-based learning. This is a teaching methodology that focuses on the process and makes it possible to solve complex problems from multiple perspectives. It has the advantage of approaching reality to issues of professional life. It can take three approaches: be teacher-directed, students-directed or be directed by both. The modality that will be carried out is the joint direction [3].

Despite of giving the theoretical contents in classes, the final written work that they must prepare allows activities for its elaboration by the group.

In this way, problem-based learning will be nurtured by a holistic perspective, developing reflective processes to increase knowledge [4].

Challenges are presented to students about the cognitive processes they will use. The reflection, argumentation, evaluation of missing information would be the most appropriate for achieving the proposed objectives and would facilitate the integration and analysis, rather than the processes of memorization [5]. One important goal through the collection of the written works is the establishment of a case-library that could serve for the orientation of future methodology changes in approach into a study-case.

The general role that the teacher will have in the ABP is supervising and orienting the process. Also, analysis and scaling up of research and viewpoints as well to highlight important aspects and correct methodical and/or conceptual errors [3].

The methodology will be developed throughout the course and finalized with a monographic exercise and oral exposure. The steps begin with the search for conflict within the axes and then a preliminary investigation that brings together the reading of the problem analysis. The learning objectives, which were set out by the teacher at the beginning of the course, are defined. All the members should recognize what information have and what is missing in order to be successful and able to address the problem.

The monograph exercise has the following characteristics: a title that specifies the subject and area of occurrence. An introduction that has antecedents of the problem, justification of the choice of topic and the objective that describes and analyse the use of a management tool in a real current problem. A central part that should contain the causes and social actors involved, a baseline of existing natural resources, a normative section that includes national, provincial, municipal and/or resolution laws. A final section that incorporates a management tool, justifying the choice and proposing the methodology. Finally, the conclusions, bibliographical references and the corresponding annexes. The guidelines are maintained on the virtual platform throughout the course.

As logical, this strategy is benefited by a collaborative work, where the interaction of the group is defined by the members themselves and increase the elaboration throughout the exchange of ideas. In contrast to cooperative work where tasks are usually given to each member by the teacher who articulates and define roles. The collaborative work promotes modes of interaction so that the teaching and the students jointly nurtured [4].

With this method, students are guided to draw their own conclusions, processing are orienting towards reflexive thinking, which allows them to “maintain the state of doubt and to carry on systematic and protracted inquiry these are the essentials of thinking” [6].

In group work, agreement is achieved among the members who present their own arguments, expose different positions to reach consensus and escalate in a superior knowledge. As the choice of case is by students themselves, should be immersed in one of the thematic axes that are proposed at the beginning of the course. These axes together with reference bibliographic material is available on the virtual platform.

Regarding the characterization of the work, it must have a correct title, definition of the conflict and its site of occurrence to determine the correct legal jurisdiction. The introduction will contain a brief statement of the problem and the development should include causes and social actors involved.

The purpose is to determine a baseline of the natural resources existing in the region and characterize them, also to determine which ecosystem services are affected, search for the pertinent normative, and application of an environmental management tool. Finally, the work should include a conclusion that integrates the main aspects in an analytical way, and bibliographical references.

The monograph will be evaluated with an analytical rubric. The rubric is a matrix, which can be double-entry, in which the monograph is related to the evaluation criteria (those that relate to the processes and contents that are judged) and attainable levels of achievement (for example: excellent, satisfactory, inadequate), in its intersection there are the definitions of quality that explain in detail what the students must do to satisfy the variable [7].

This type of analytical rubric serves to detect the strengths and weaknesses of the variable. It is a useful guide to evaluate the learning that has taken place. The levels that are translated into a summative score to the final note such as the following: Inadequate (0-25) - Satisfactory (25-50) and Excellent (50-75) The rest of the points to get 100% will fulfil with five presential exams during the course.

In this case the evaluation for group work is holistic, all sections are analysed globally for its evaluation [8]. The grade is translated equally to all members of the group, who share the same note.

For this purpose, the teacher analyses by a descriptive observation form, considering the contribution of ideas, the guidance of the group to the answers to the specific questions; and the understanding of indications as well as comments and explanations of the work in the feed-back and pre-deliveries, as a way of strengthening the learning process [9].

The results of the new methodology allow students integrate and conceptualized through the study of a real conflict different dimensions: Natural resources, social dynamics and normative aspects that improved the participation and commitment to the subject and gives them an overview of the aspects to be considered in professional life.

In the second of the objectives, which is about contextualizing the environmental implications of agricultural and agro-industrial productions, they become aware of the natural resources most affected.

The possibility to apply an environmental management tool for the description of a real problem allows them to internalize its importance and generate the ability for future replication.

#### **IV. CONCLUSIONS**

The work methodology presented in the article seeks to generate work spaces of mutual aid and approach theoretical concepts from real life practices. In this sense it was chosen as an environmental management tool to generate a space of reflection on the impacts of the systems that necessarily include technical, natural, social, economic and regulatory aspects.

Both the guideline instances of reflection, as well as the out-classroom work mediated by the work pre-deliveries, seek to make possible the debates and consensus within the work group, redirect the same and mediate in the necessary investigation.

The change from the traditional examination methodology in which the group of students were conducting their examinations of each discipline separately, to the approach of a current agro-environmental conflict analyzed from multiple disciplines is highly enriching for career students.

With an eye on the same object of study from different disciplines it is possible to access knowledge in the same way as Gardner says, as a room accessed from different doors [10]. That is the final goal of the strategy: that the students begin to engage in their own learning.

#### **ACKNOWLEDGEMENTS**

This work was funded by Project UBACyT 20020170200263BA 2018-2019.

#### **REFERENCES**

- [1]. MINCYT (Ministerio de Ciencia y Técnica). 2017. Presentación del Programa Nacional de Ciencia, Tecnología e Innovación para el Desarrollo Sustentable. Polo Científico Tecnológico. Buenos Aires. 26 de abril de 2017. [www.polo.mincyt.gob.ar](http://www.polo.mincyt.gob.ar)
- [2]. UBA. Universidad de Buenos Aires. 2016. Resolución Consejo Superior N° 6180/2016. 30 de Noviembre de 2016. EXP-UBA 80.441/2016. Available on: [http://www.uba.ar/archivos\\_uba/2016-12-14\\_80441.pdf](http://www.uba.ar/archivos_uba/2016-12-14_80441.pdf)

- [3]. Barrell. 2007. *PBL Problem Based Learning. An Inquiry Approach*. Skylight Training and Publishing Inc. Transtlate: Marcelo Pérez Rivas. 1aed 4a reimpresión Buenos Aires Manantial. 2007. Pp268.
- [4]. Litwin, Edith. 2016. *El oficio de Enseñarcondiciones y contextos*. Biblioteca Fundamental de la EducaciónPensar y Hacer la Educación. 1ª ED. Paidós.
- [5]. Biggs John and Catherine Tang. 2011. *Teaching for Quality Learning at University. What the Student Does*. The Society for Research into Higher Education Open University Press. McGraw-Hill
- [6]. Dewey John. 1910. *How We Think*. D.C. Heath & Co Publishers. Boston New York Chicago.
- [7]. Gataca Lara F and Uribarren-Berrueta T .2013. ¿Cómoelaborar una rúbrica? *Inv Ed Med* 2(1) 61-65.
- [8]. Camilloni A. 2010. "La evaluación de trabajoselaboradosengrupos". EnAnijovichy otros. *La evaluaciónsignificativa*. Paidós 151-176.
- [9]. Jonhson D, Jonhson R &Holubec E. 1999. *El aprendizajecooperativoen el aula*.Editorial Paidós.
- [10]. Perkins David. 2001. *Smart School. From Training memories to educating minds*. The Free Press, Nueva York. Translate: Gabriela Ventureira 2º Reprint, Barcelona. Editorial Gedisa

IOSR Journal Of Humanities And Social Science (IOSR-JHSS) is UGC approved Journal with Sl. No. 5070, Journal no. 49323.

C. Bonafina. " Teaching Proposal in Advanced Agronomy Students for Agricultural Environmental Management.." IOSR Journal of Humanities and Social Science (IOSR-JHSS). vol. 24 no. 10, 2019, pp. 18-21.