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Implementation Of Sustainability In The Training Of Secondary School Teachers:  
Teaching Strategies And Practices

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Sustainable development is a model that the United Nations has considered as its own. It requires a social change to which different strategies contribute, including education. The purpose of this study is to promote processes aimed at ensuring that the principles and values of sustainable development permeate the teaching project of an educational centre and the different subjects of the degrees that are taught in it. It is not intended to educate about sustainable development -to explain the most pressing problems- but to educate for sustainable development -to activate behaviours consistent with the approach- (Jucker and Mathar, 2015).

UNESCO continues to promote Education for Sustainable Development (ESD) through the Global Program of Action (GAP), covering ESD policies and practices. This program has two objectives: to reorient education and learning so that everyone has the opportunity to acquire the knowledge, skills, values and attitudes that empower them to contribute to sustainable development, and to strengthen education and learning in all agendas, programs and activities that promote sustainable development (UNESCO, 2014).

This study is part of a project aimed at promoting the inclusion of competences in education for sustainability in the pedagogical and educational training of secondary school teachers, facilitating the incorporation of the principles and values of sustainable development in the programs and teaching practice of the subjects.

The following research questions are posed:

Can work in collaborative groups consisting of teachers and specialists provide teachers with an active commitment to the model of education for sustainable development?

Is it possible to trigger teacher self-reflection processes on the teaching practice analysed in the light of the training demands of sustainability?

Is it possible to promote sustainability-oriented self-regulated teacher innovation

networks in universities?

The training of teachers is the cornerstone of any renewal of education and, in particular, of teacher training. This is reflected in the report of the European Commission "Science Education Now: a Pedagogy for the Future of Europe" (Rocard, 2007). In addition, the evaluation of global progress in Education for Sustainable Development, commissioned by UNESCO (Tilbury, 2011), ratifies teacher training as a significant factor. In this sense, teachers have to lead the processes of cross-curriculum sustainability learning in all the subjects; the consolidation of these processes must be endogenous, emerging "from the bottom up". Teachers must consider themselves as agents of change for sustainability. Likewise, the importance of a context that facilitates this perception and of students sensitized in the problems of sustainable development is remarkable.

The present research focuses on the Master's Degree in Secondary Education Teaching of the University of Valencia (Spain). It is an official university master of professional profile that integrates the new professional competences for teachers demanded by the European Higher Education Area (EHEA). In addition, this master is mandatory in order to be a teacher of Secondary Education in Spain. It has a one-year programme and is intended for university graduates of all degrees. It is composed of different subjects related to the 20 specialisations that are taught. In this academic year 2016-2017, 980 future teachers are enrolled.

The objectives of this study are:

- To encourage teachers of the Master's Degree to implement Education for Sustainability in different specialisations.
- To form collaborative working groups for the permanent improvement of teaching practice, and to design a strategy to facilitate, in the collaborative working groups, teacher innovation networks.

#### Methodology, Methods, Research Instruments or Sources Used

The study includes a descriptive and exploratory research, assuming the methodological complementarity, combining the use of a quantitative approach -adequate to measure final and quantifiable effects- with the appropriate qualitative approach for the interpretation of the results and deepen in more precise visions of the reality to study.

The techniques of data collection are primary (observation, dynamics, debates...) and secondary (registration: instrument of analysis of teaching guides).

The techniques used have been Document Analysis and Practical Workshops. The analysed documents have been the teaching guides of the different subjects in which the study has focused. A representative sample was selected, consisting of 6 of the 20 specialisations of the Master and a total of 21 subjects.

The instruments used are registration and analysis sheets and protocols for monitoring the dynamics and debates developed for this research. These instruments have helped to detect the presence/absence of competences for sustainability, as well as other items

related to it in the teaching programs.

The practical workshops for the teachers of the Master have been based on participatory and collaborative techniques, which have allowed to detect other issues like the teaching and learning methods (e.g. participatory methods, cooperative learning, problem-based learning, debates.) used in each subject, and if sustainability is included when preparing the Master's Final Projects in order to establish whether teacher training is helping to promote a transition towards teaching practices including principles, criteria and values dealing with sustainability.

Teachers are participating in workshops to explore how educator's competences can be developed and are also providing support to each other to ensure that adequate tools and materials for ESD can be accessible for the network that is being created.

#### Conclusions, Expected Outcomes or Findings

The first results of the study offer a diagnosis and a foresight on the inclusion of sustainability in the area of teacher training under study, and serve as a starting point to begin a process of transition towards teaching practices that include the principles, criteria and values related to sustainability, both at the personal as well as institutional level of each teacher.

The study shows a great implication of the Academic Coordinating Committee and the coordinators of the master's specialisations, emphasizing the need for technical advice for teachers. In this sense, institutional support is particularly relevant in the inclusion of activities aimed at developing competences related to sustainability in teaching programs.

The results of this project show that the work in collaborative groups formed by teachers and specialists can facilitate an active engagement with the model of education for sustainable development. They also point out that it is possible and necessary to promote self-regulated teacher innovation networks aimed at sustainability in universities.

Strengthening synergies is vital to equip future teachers with the competence to include Sustainable Development in their teaching.

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