

Sustainable Development Planning and Project-Based Learning

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The educational subject of Sustainable Development Planning in Europe is evolving due to the implementation of the Bologna Agreement across the European Higher Education Area (EHEA). A project-based learning strategy for training Sustainable Development Planning in postgraduate programs, in Spain (Universidad Politécnica de Madrid, UPM-GESPLAN). This project-based learning strategy is applied to an International Postgraduate Program for Sustainable Rural Development.

Keywords: rural development ; Bologna Agreement ; project management ; Research universities

1. Introduction

Planning and Sustainable Development concepts are deeply linked in both the public and private domains. They come together in what could be called “operability” and are academically intertwined because they share teaching and research topics. The relationship between plans, programs and projects is traditionally included in technical universities’ curricula. The European dimension of planning for rural development is relevant for at least three reasons: the need for the rural planner to be aware of the different territorial planning systems that operate across the EU; the increase in cross-border planning policies and other transnational project planning for rural development; and the European level in the hierarchy of planning levels ^[1].

Currently, researchers are involved in a wide-reaching process of reflection and change aimed at promoting a qualitative leap in the educational models of universities in the European Union. This approach stems from different agreements reached in the EU to establish the European Higher Education Area (EHEA) as the basis of a new knowledge-based economy that responds to the challenges of globalization.

However, the starting point of any strategy should be a clear idea of the university’s end goal and purpose. Whatever model is adopted, one thing should remain unaltered in the university institution—the incessant search for truth in which teachers teach what they discover day to day, subjecting their own knowledge to permanent criticism, with a marked vocation for service to the society in which they are immersed ^[2]. From this relevant vocation of service to society in which the university is immersed, sustainable development models have been generated, linking research and teaching, especially from the so-called world-class universities ^{[3][4]}.

The high level of qualifications, thinking about higher education is currently equivalent to thinking about creating world-class universities ^{[4][5]}. The prestige of the researchers and the effectiveness and transferability of knowledge, which they provide both the public and private sectors, demonstrate that research universities represent a new successful educational model that generates knowledge and interacts with society ^[4].

The internationalization of higher education and rise in international student mobility was accompanied by much reflection on the extent to which universities were equipping their students to be future world citizens or “world professionals” ^[6]. In this context, the universities began methodological changes with approaches focused on new competences and with the aim of improving knowledge and aptitudes under a personal, civic, social, or job-related perspective ^[7].

It is fundamental to consider the aptitude and abilities that society demands of its future professionals—including helping the next generation of practitioners and sustainable planning leaders—when designing any educational strategies. At the basis of the education there must be a core understanding of sustainability planning and the development of skills to contribute to sustainability management issues.

Within this general framework, numerous studies around the world ^{[8][9][10][11]} have proposed project-based learning (PBL) as the most suitable means of achieving effective competence-based education ^{[2][10][11]} that integrates knowledge, skills and values. The models integrating PBL have their scientific basis in generating learning processes ^[8]. They are grounded in the belief that humans construct new knowledge over a base of what they already know ^[2] and of what they have experienced. This information is shared through active participation and interaction with others.

The Bologna Agreement, launched with the Bologna Declaration of 1999 (signed by 29 European countries), is one of the main voluntary processes at the European level (today, it has been implemented in 48 states) that define the European Higher Education Area (EHEA). The Bologna Agreement had many positive impacts on sustainable planning education ^{[4][12][13][14]}, opening up new opportunities that were closely linked to the international framework. In the context of the Bologna process, European universities have designed educational strategies from a competence-based approach to ensure that efforts to raise the quality of teaching and research go hand-in-hand with improving opportunities for under-represented groups ^[15]. One of these is the Erasmus Mundus program, which enables students to combine degrees from different disciplines to develop planning competences ^[16].

In many Master's of rural planning programs, sustainability and social dimensions include both a broad academic research and a professional field. Many universities have begun to introduce curriculum innovation and change to facilitate the curricular integration of generic skills underlying education for sustainable development. However, the literature and research in this area to date show few successful examples of comprehensive large-scale curriculum change and even fewer in relation to project planning of rural development.

As a professional field, sustainable planning is an institutionally embedded practice; it is also a practice that is inevitably interwoven with politics and with on-going conflicts over the allocation and use of public and private resources and public lands. Thus, politics is institutionally embedded as well. It follows that the activity of planning is understood and practiced differently in different institutional settings that vary significantly across countries and even cities. Moreover, within any given setting, planning must continuously reinvent itself as circumstances change ^[17].

There is universal acknowledgement that a wide-range of skills and knowledge is required to create action-orientated sustainability ^[18]. This international context requires the adoption of a "one-world" approach to planning education that equips students to work in different "world contexts" ^[16].

In the European Union, this professional field emerged with the new sustainable planning approach of the European LEADER Initiative, based on the concept of "endogenous development" ^[19] and recognizing the importance of local processes and social participation ^[20]. Numerous researchers have been described ^{[21][22][23][24]} the specifics of this new experimental sustainable planning approach, creating new rural development planning models. "Working with People" (WWP) is one of these models, and it is understood as the practice of the pre-professional team that seeks to connect learning-knowledge with action, from experimental learning by connecting to real-life situations, through common projects, which, in addition to the technical competences, incorporate capacity building and the value of the people who are involved and participate within the context of the project-based learning. In this WWP model, the concept of "social sustainability" confirms that strong social networks and social cohesion can be more important for a rural community's resilience than the project's physical structure ^[25].

2. Educational Strategy: Project Planning for Sustainable Rural Development

Researchers used the prevailing PBL orientations in the teaching of sustainable development and the EHEA experience to advocate a methodological change—educators as role models and learners experiential learning by reconnecting to real-life situations; holistic thinking, skills, and knowledge associated with complex, multi-layered, and interconnected systems; interdependency and transdisciplinary connections between subjects; and approaches to developing and honing critical thinking.

As planning education varies so much over the world, reflecting each country's specific planning practices, any statement on the "core curriculum" of European planning education must pay respect to these variances and, therefore, cannot and should not be explained in too much detail. Nevertheless, researchers adopted the core requirements as guidelines—common competences and values shared by the international community that are suitable for high quality sustainable project-program management education all over the world ^[26]. The most suitable way to implement the change was to adopt a professional point of reference that would represent the needs of society. Thus, the International Project Management Association (IPMA) standard was adopted for learning and evaluation toward international competences of

project-program management for sustainable development. The IPMA is an organization made up of more than 20 national professional associations from around the world. The adoption of this international standard enabled the initiation of the university stage of specialized training for future professionals, thus providing them with more opportunities to work in different “world contexts” [16].

2.1. How is Learning from Experience Possible?

The teaching activity depends on the type of teacher we are, and we say that there are two kinds of teachers—those who only transmit knowledge and those who create knowledge from their research. Professor Shulman from Stanford University said that, “Some teachers have 20 years of experience. Other teachers have one year of experience 20 times. If you think about it for a moment, learning from experience is a miracle” [27]. This challenge was the origin of the project-planning education strategy: “Learning from Experience” in the teaching of sustainable rural development.

The first steps of the PBL from “Working with People” were in 1987, with the emergence of an educational cooperation agreement between the Project and Rural Planning Department at the Universidad Politécnica de Madrid (UPM) and the Regional Government of the Community of Madrid [16]. This collaborative learning partnership was based on the concept of “planning as the professional practice” that specifically seeks to link knowledge to action. The educational framework emphasizes that planning is different from an activity like engineering where means are efficiently related to ends and projects determine the course of action [3]. The relationship between knowledge and action is interactive, a continual process of social learning among the actors involved. First, the sustainable planning team—the Department of Projects and Rural Planning of the University—is in an intermediate position between the sustainable rural project clients—the technical teams of the Head Office of Rural Development, Agriculture and Food of the Regional Government—and the beneficiaries of the projects—the population that lives in the rural areas. Second, the students are inserted into this framework to participate in a social learning process by solving real problems in teams [2]. During this process, students are enriched with external knowledge gained from direct contact with the different people involved (farmers, environmentalists, entrepreneurs, managers of local action groups, local development agents, and local-regional government managers).

This is not about articulating a theory and then applying it to a situation. The multi-stakeholder participation in the process of formulating rural development projects and adapting sustainable policies plans and programs for the Government of Madrid is fundamental for this work. It is a different way of thinking about planning the art of linking knowledge to action in a recursive process of social learning [28]. Researchers emphasize that the knowledge we use and develop is not just the systematized knowledge of scientists, professors, and technical experts. The experiential knowledge in the course of the action [28][29][30] is equally important to the planning process.

The collaborative learning program—implementing PBL from “Working with People” approach—using the government–university agreement in the graduate and postgraduate curriculum introduced students to this new vision of planning and encouraged them to gain external knowledge from direct contact with diverse people. These professional relationships and complementary information enrich the students’ base knowledge and lead them to develop new knowledge. This was one of the main elements of the strategy: participation in sustainable rural projects that respond to real needs, giving students the opportunity to leave the classroom to solve problems directly with external agents.

Until this program was launched, Friedmann’s theories of planning pedagogy and social learning [28][29][30] had never been applied to the European context of project planning for sustainable rural development. This was the main contribution at the time.

The project-planning education process has a dynamic element in which students “learn to learn” about the reality of the rural world and how public administration—the project client—works. In the coordination of the project-based learning activities, a method of logic is applied in which learning experiences respond to structuring the methodologies of project planning and evaluation. The active method of “learning by doing” [27][31][32] is particularly relevant in projects and planning education and provides enormous potential for originality, creativity, and common sense. In addition, it is important to remember and to learn from the experience. It is an excellent method to develop the habit to remember even the most difficult experiences. Without that habit, little learning can occur [27]. Another feature of this approach is “uncertainty”—acknowledging that there are ranges of possible approaches to sustainability and that the situation is constantly changing, indicating a need for flexibility and lifelong learning [18]. Educational research studies increasingly demonstrated the need for student “ownership” of their programs as a basis for deep learning [27][33].

The PBL strategy framework, from the WWP approach, integrates relationships between research groups, educational innovation, and collaborative partners for the construction of sustainability from three interrelated dimensions (research

activity, teaching-learning, and collaborative partners for sustainability), as shown in **Figure 1**.

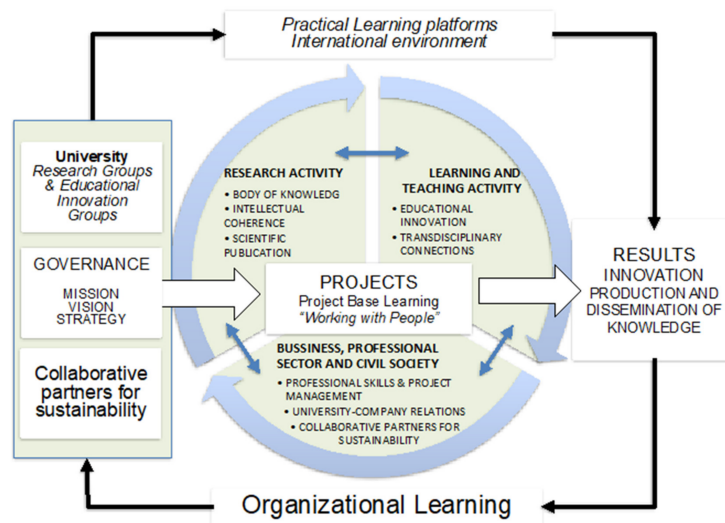


Figure 1. Perspective-contextual dimension: project-based learning (PBL) strategy for Sustainable Development Planning in postgraduate programs.

2.2. Alliance for Sustainable Development: Agris-Mundus International Master's

In this way, teaching and research are included in an international strategy, which gradually provides students with competence training. Their knowledge increases, and their attitudes are shaped as they travel along this educational “road.” They are given opportunities to acquire certain basic experience in advance. The graduate level includes an Erasmus Mundus Master's (International Master's of Sustainable Development), in collaboration with six universities in the EU—Agropolis Montpellier CNEARC (France), Wageningen University and Research Centre (Holland), The Royal Veterinary and Agricultural University KVL (Denmark), University of Cork (Ireland), and University of Catania (Italy)—and another nine universities outside the EU, as well as a doctoral program adapted to the Bologna Agreement. These relationships favor the external mobility of students and academics, creating the Agris-Mundus Sustainable Development Alliance.

The general objective of this program is based around validating the competence of individuals with respect to their knowledge, experience, and attitudes in relation to project planning for sustainable rural development [26].

This Master's Program at UPM is officially recognized by the European Union and is fully integrated in the European Space for Higher Education. Characteristics of the program are thus enriched with the criteria emanating from the Erasmus Mundus program: cooperation and mobility within higher education in order to achieve the objectives of improving European higher education and promoting intercultural understanding through cooperation with non-member countries.

The Master's Program has reinforced its international dimension (with an internationalization rate of 77%) through the international Alliance for Sustainable Rural Development. The international dimension of the program is reinforced in two ways: First, it forms a part of the international “Network of European Agricultural” (NATURA) related to sustainable rural development and created in 1988 in Louvain, Belgium. This association develops systematic actions within the field of development programs. Second, the program has reinforced its international dimension through Erasmus Mundus, establishing an association with eight higher education centers in non-member countries. Through this action, an increased global profile has been achieved, with a reinforced worldwide presence, and associations with higher education institutions in non-member countries have been created.

The research dimension is important in the Master's and offers direct access to the UPM's PhD program, complementing the experience with the participation of noted professionals from other universities, including Stanford (USA) and Berkeley (USA). On the other hand, in 2009, after the accreditation process, the program was incorporated within the Registration of Competence Development Programs, being the first registered program for the IPMA in Spain and the first in the world that applies IPMA competences to sustainable rural development [26]. According to the IPMA model, the individual balances the project's economic, social and environmental aspects to meet the requirements for sustainable development and to make the project results sustainable [34].

Researchers work together with different institutions that support the master's program with conferences, field trips, and permanent agreements for research stays during the Master's thesis, etc. Many of students conduct a research stay as part of their Master's dissertation. All tutors are recruited through the institutions participating in the Alliance for Sustainable Rural Development Master of Science Network (**Table 1**) partners. This Alliance uses research projects in rural communities in public and private lands as "laboratories of learning" for the Master's students.

Table 1. Alliance for Sustainable Rural Development Network partners.

Academic Institutions	
Montpellier SupAgro (Francia) Wageningen University and Research (Holland) The Royal Veterinary and Agricultural University (Denmark) University of Cork (Ireland) University of Catania (Italy) Colegio de Postgraduados de (México) Universidad Politécnica Salesiana (Ecuador) Universidad Nacional Mayor de San Marcos (Perú) Universidad Uniagraria de Colombia	UCAV–Universidad Católica de Ávila Pontificia Universidad Javeriana (Colombia) ECOSUR, El Colegio de la Frontera Sur (México) Universidad Nacional de la Plata (Argentina) Universidad Nacional de Colombia Universidad Nacional de San Agustín (Perú) Universidad Católica Sedes Sapientiae (Perú) Universidad Autónoma de Nariño (Colombia) Pontificia Universidad Católica Madre y Maestra (Rep. Dominicana)
Professional Partners	
International Project Management Association (IPMA) Asociación Española de Dirección e Ingeniería de Proyectos (AEIPRO) Instituto Interamericano de Cooperación para la Agricultura (IICA) Food and Agriculture Organization (FAO) Coordinadora de Mujeres Aymaras, CMA (Perú) FESBAL–Federación Española de Bancos de Alimentos Fundación Ingenio (Spain) IDC Cuenca–Instituto de Desarrollo Comunitario de Cuenca (Spain) Zerca y Lejos ONGD (Spain) Asociación Agrandando la Olla (Spain) Gobierno Provincial de Manabí (Ecuador)	GALSINMA, Grupo de Acción Local de la Sierra Norte de Madrid (Spain) National Park Service, Sierra de Guadarrama International Center for Agricultural Research in the Dry Areas ICARDA Jordania IALA Guaraní–Instituto Agroecológico Latinoamericano (Paraguay) ANC–Associação de Agricultura Natural de Campinas e Região (Brasil) MAGRAMA–Ministerio de Agricultura, Alimentación y Medio Ambiente National Park Service AMSA–Autoridad para el Manejo Sustentable de la Cuenca y del Lago de Amatitlan (Guatemala) Coopérative Fermes de Figeac (Francia)
Agency and Organizational Partners	
CONICET, Consejo Nacional de Investigaciones Científicas y Técnicas (Argentina) Servicio Holandes de Cooperación al Desarrollo	AECID, Agencia Española de Cooperación Internacional para el Desarrollo

With the objective of disseminating knowledge, the UPM Research Groups carry out seminars and workshops with different approaches, including territorial research workshops in selected disadvantaged communities in Latin America and encounters for dialogue, reflection, and debate with entrepreneurs, academics, and civil society actors linked to different "laboratories of learning." Land resource managers and scientists regularly collaborate on issues related to rural development, social and environmental conflicts, sustainability, and preservation of cultural resources.

Two research groups from the UPM jointly developed this international academic program. First, the GESPLAN Research Group pools together a group of professors and researchers who have worked for more than 25 years in the area of project management and planning for sustainable rural development of communities. Among the members of the group are young researchers and professionals in the field of agronomic engineering, industrial engineering, and economics. This group of experts has extensive experience in planning in development, program evaluation, and project management and hence, the problems associated with rural development. On the other hand, the SILVANET Research Group is made up of professors, researchers, and staff from the School of Forestry and Natural Environment Engineering (ETSIMFMN, UPM), and its focus is ecology and sustainable environmental management, in particular the modeling and simulation of natural processes, forestry, landscape ecology, territorial planning, and management of the environment.

Figure 2 summarizes these chair company partnerships, which are the means to generate collaborative projects and "practical learning platforms" used in the Master's.

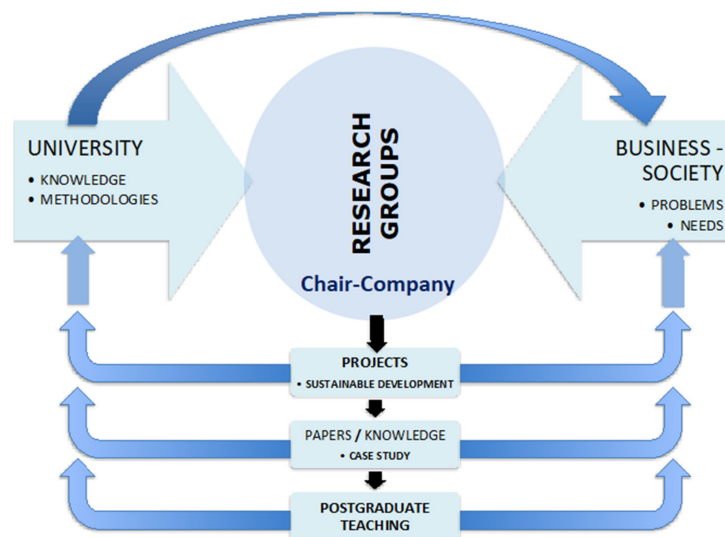


Figure 2. PBL strategy.

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