



## Intellectual Output 1

# PEDAGOGIC DESIGN OF TRAINING MODULES AND LEARNING MATERIALS FOR THE APPLICATION OF SERVICE LEARNING PROJECTS IN FOREST FIRE MANAGEMENT

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Edit by Glenda Galeotti



# 1. Service-learning as evolution of the learning devices (by Silvia Mugnani)

## 1.1. Definition of S-L

According to Jacoby (2014), service-learning is a form of experiential learning in which pupils participate in activities that address community needs. Service-learning has two key components: reflection and reciprocity (Jacoby, 2014). Learning occurs as a result of structured opportunities for reflection designed to achieve planned learning outcomes (Jacoby, 2014; Sotelino-Losada, Arbués-Radigales, García-Docampo & González-Geraldo, 2021; Lorenzo Moledo, Sáez-Gambín, Ferraces Otero & Varela Portela, 2021). Hatcher, Bringle & Muthiah (2004) and Lorenzo Moledo, Sáez-Gambín, Ferraces Otero & Varela Portela (2021) specify that the nature of reflection is a central element when it comes to the quality of service-learning projects and concluded that reflection that is structured, regular, and clarifies values contributes to the quality of service-learning (Hatcher, Bringle & Muthiah, 2004) and maximizes the cognitive and non-cognitive learning options in students (Lorenzo Moledo, Sáez-Gambín, Ferraces Otero & Varela Portela, 2021). Moreover, the nature of reflection is more significant to the quality of the service-learning than the quantity of reflection (Hatcher, Bringle & Muthiah, 2004). Lorenzo Moledo, Sáez-Gambín, Ferraces Otero & Varela Portela (2021) shed light on three variables that university professors should consider in the reflection process: when, with whom, and why the reflection should be used. Only when reflection has its place, its protagonists, and its goals then service-learning has a positive impact on learning and training (Lorenzo Moledo, Sáez-Gambín, Ferraces Otero & Varela Portela, 2021). Therefore, the authors suggest that students should be immersed in the reflection process from the beginning to the end of the service-learning experience. In addition, reflection should involve all actors, from the university to the community. Finally, reflection should be oriented towards sharing feelings about the experience (Lorenzo Moledo, Sáez-Gambín, Ferraces Otero & Varela Portela, 2021). Bringle & Hatcher (1996) specify the type of reflection activities - such as directed writings, small group discussions, and class presentations - through which service activities are related to course material in a service-learning course.

On the other hand, reciprocity means that there is a partnership between educators, students, and the community and, therefore, "service-learning should be designed *with* the community to meet needs identified *by* the community" (Jacoby, 2014, p.4). Sotelino-Losada, Arbués-Radigales, García-Docampo & González-Geraldo (2021) refer to reciprocity as the relationship between service and learning. If this reciprocal relationship occurs, quality service to the community will be provided and students' learning advanced (Sotelino-Losada, Arbués-Radigales, García-Docampo & González-Geraldo, 2021).

Service-learning can also be defined from a methodological perspective. Service-learning combines two methods from active pedagogies: experiential learning and action in service to a community (Sotelino-Losada, Arbués- Radigales, García-Docampo & González-Geraldo, 2021). Therefore, Sotelino- Losada, Arbués- Radigales, García-Docampo & González-Geraldo, (2021) define service-learning as a pedagogical methodology used in higher education to combine, in a single project, educational plans and the performance of a service in a community. Pérez Pérez *et al.* (2019) describe service-learning as a methodological strategy that combines theoretical knowledge with the knowledge acquired through the provision of a service to the community. Culcasi (2020) identifies service-learning as an innovative pedagogical response to provide a useful stimulus to structure one's self-identity within the current historical context characterized by deep crises that touch upon all human dimensions.

## 1.2. Benefits and outcomes of S-L

Jacoby (2014) and Salam, Iskandar, Ibrahim & Farooq (2019) point out that service-learning positively affects students, the university, and the community.

A variety of potential outcomes of service-learning pedagogy have been identified for students: gain of skills such as communication skills (Jacoby, 2014), ability to work independently, teamwork (Jacoby, 2014), information literacy (Jacoby, 2014), critical thinking (Jacoby, 2014), collaborative problem- solving skills (Jacoby, 2014), leadership (Jacoby, 2014), social awareness and sense of civic responsibility (Salam, Iskandar, Ibrahim & Farooq, 2019).

Service-learning enhances students' understanding of real-world problems, challenges their personal values (Salam, Iskandar, Ibrahim & Farooq, 2019), and stimulate them to question what they have learned from a critical perspective, and their social and environmental role (Sotelino-Losada, Arbués- Radigales, García-Docampo & González-Geraldo, 2021). Service-learning has the potential to develop a vision of social justice in the students (Sotelino- Losada, Arbués-Radigales, García-Docampo & González-Geraldo, 2021). At the same time, students gain a deeper understanding of the complexity of social issues and develop a closer connection to their communities (Jacoby, 2014). Service-learning also facilitates cultural and racial understanding and reduces stereotyped thinking (Jacoby, 2014).

Students who participate in service-learning are more likely to report greater satisfaction with their college education and are more likely to persist to graduation and to continue with service post-college or to choose careers that are related to service (Jacoby, 2014). Service-learning benefits students' attention and allows students to better understand course theories, concepts, and their application to practice (Jacoby, 2014; Salam, Iskandar, Ibrahim & Farooq, 2019).

Service-learning contributes to students' overall personality grooming, character building, personal growth and cognitive development (Jacoby, 2014), and social learning (Salam, Iskandar, Ibrahim & Farooq, 2019).

Moreover, according to Jacoby (2014), service-learning plays a role in students' moral development, spiritual growth, empathy, efficacy, sense of personal and social responsibility, and commitment to service during and after college. Students who engage in service-learning are more likely to have better social and psychological well-being (Jacoby, 2014).

Service-learning has also benefits for faculty members. For instance, service-learning provides an opportunity to perform action research (Salam, Iskandar, Ibrahim & Farooq, 2019) or simply orient teaching and research in community settings and helps identify current issues (Jacoby, 2014). Service-learning brings advanced opportunities for research, advancement, and professional recognition (Jacoby, 2014).

Furthermore, faculty members are stimulated by service-learning projects, to transform their teaching styles (Salam, Iskandar, Ibrahim & Farooq, 2019) and/or to develop new ways to teach familiar material and to engage students more deeply in the learning process (Jacoby, 2014). Service-learning stimulates professional development (Jacoby, 2014) and improves teachers' ability to critically think about existing theories and their applicability through logical connections with real-life problems (Salam, Iskandar, Ibrahim & Farooq, 2019). Faculty who use service-learning discover that it brings new life to the classroom, enhances performance on traditional measures of learning, increases student interest in the subject, teaches new problem-solving skills, and makes teaching more enjoyable (Bringle & Hatcher, 1996). Service-learning increases interactions between faculty members and deepens relationships with students (Jacoby, 2014).

Universities institutions also benefit from service-learning as students become more engaged in learning, better prepared for the job market, more satisfied with their college experience, and more likely to graduate (Jacoby, 2014). Furthermore, service-learning provides evidence that the institution is engaged in promoting social responsibility, global citizenship, and economic development in the local community (Jacoby, 2014).

The least amount of data concerns service-learning benefits to communities. Service-learning contributes to resolving local community problems by providing technical, emotional, and cognitive support (Salam, Iskandar, Ibrahim & Farooq, 2019) and provides fresh approaches to problem-solving (Jacoby, 2014). Similarly, Jacoby (2014) suggests that service-learning benefits include new energy and assistance to broaden the implementation of existing services or to begin new ones.

Furthermore, service-learning offers the opportunity to communities to access institutional resources and the possibility to participate in the teaching and

learning process of students who are motivated to learn and eager to share their insights, knowledge, and perspectives (Jacoby, 2014).

Finally, service-learning can provide communities with data to leverage grants and other funding, strengthen linkages and networking among community organizations, allow budgetary savings, advance the overall goals of the organization, contribute to the visibility of the organization, and provide better service to clients (Jacoby, 2014).

### 1.3. Limitations and future perspectives of S-L

Clifford (2017) moves a critique to three core points of service-learning discussed above. First, the author challenges the element of reciprocity and advocates for relationships based on solidarity. The integration of solidarity would enhance the democratization of the partnerships and configure service-learning as a transformative process rather than an exchange of products (Clifford, 2017). In other words, Clifford (2017) affirms that, within the neoliberal university, traditional service-learning is perceived as providing a service *for* the community while it should be based on a collaboration *with* the community.

Second, traditional service-learning is also perceived as a product for students to advance their careers and is oriented towards skills building rather than on social justice (Clifford, 2017). Clifford (2017) suggests making more space for relationship building in order to achieve the original ideals of service-learning: foster social justice. Additionally, students should be more involved in the creation of the service-learning process which would strengthen student-community relationships that lead to personal and community transformation (Clifford, 2017).

Third, in the neoliberal university, traditional service-learning is used as a corporate brand, what Clifford (2017) defines as the “kinder face” (p.4) of the university that creates a positive public image by showing the relevance of the university in fulfilling community needs. Therefore, Clifford (2017) urges, for the future of service-learning, to prioritize the process rather than the product.

Other objections to service-learning are synthesized by Speck (2001) which indicates that 1) professors see service-learning as something that takes too much time and too many resources; 2) should not be required as some authors would (e.g. Schnaubelt & Watson, 1999); 3) should be resisted because it is a form of indoctrination to a particular political view on the evils of capitalism.

Moreover, Butin (2006) suggests that there are considerable pedagogical, political, and institutional limitations to service-learning.

From a pedagogical point of view, service-learning students are dependent on the following characteristics: being full-time, single, non-indebted, and childless, pursuing a liberal arts education. Such characteristics induced Butin (2006) to define

service-learning as the “Whitest of the White” (p.482) of postsecondary education. Simultaneously, service-learning should explore its applicability when students incorporate the identity categories of race, ethnicity, class, etc. which, usually, service-learning places on the served side of the dichotomy server/served.

From a political perspective, Butin (2006) agrees with Speck (2001) that service-learning is an ideologically-driven practice promoting a progressive and liberal agenda under the appearance of a universalistic one. In order to survive in higher education, Butin (2006) recommended that service-learning become more ideologically balanced.

In terms of institutional limits, Butin (2006) highlights that the academy is trying to position service-learning as a quantitative methodology to show that it positively impacts students' outcomes. However, this practice will not expand service-learning institutionalization (Butin, 2006).

#### **1.4. SL in teacher education and Sustainability Education**

Service-learning has become more and more significant in the field of teacher education (Mortari, Silva & Ubbiali, 2019). Research on this practice focuses on students' achievements through their involvement in service-learning (Mortari, Silva & Ubbiali, 2019), how participants learn in the service-learning experience (Márquez-García, Kirsch & Leite-Mendez, 2020), the effectiveness of service-learning activities on the development of socio-educational commitment, teaching self-efficacy and self-efficacy in the creation of the instructional materials of the preservice teachers (Asenjo, J. T., Santaolalla, E., & Urosa, B. (2021).

Mortari, Silva & Ubbiali (2019) report three categories of skills that students gained from the service-learning program: professional skills (e.g. reflective skills, development of a service perspective, research skills, etc.), transversal or personal skills (e.g. learn from mistakes and manage a crisis, handle the unexpected, self-critical skills and motivation) and, interrelational skills (e.g. collaborative skills, empathic listening, development of a child-centered approach). They conclude that service-learning promotes a vision of teaching guided by the principles of utility, reflexivity, participation, civic engagement, and care (Mortari, Silva & Ubbiali, 2019).

Márquez-García, Kirsch & Leite-Mendez (2020) highlights that service-learning students learn: 1) by feeling; 2) by belonging; 3) by placing action in a social perspective, and 4) by sharing experiences with others. Therefore, they point to the construction of a community of praxis for teacher education that combines theory and practice.

Tejedor et al. (2019) draw attention to the use of service-learning as a pedagogical approach for Sustainability Education as service-learning engages students in learning through a service to the community with a focus on justice and

social and/or environmental responsibility, which produces a reciprocal benefit. A comprehensive framework to apply service-learning strategy has been developed. Service-learning is executed in three phases: 1) diagnosis and planning; 2) execution and, 3) assessment (Tejedor et al., 2019).

Each phase provides an organized way of working with content and defines the role of students and teachers (Tejedor et al., 2019).

Hernández-Barco, Sánchez-Martín, Blanco-Salas & Ruiz-Téllez (2020) also propose the use of service-learning as an active-based learning methodology for achieving SDG comprehension, understanding, and promotion for Science Education and Sustainability students at the university level by underlining its strengths, weaknesses, opportunities, and threats. The strengths of using service-learning for Science Education and Sustainability include: learning becomes more significant; practices can be implemented easily; transversal competences and skills are easily developed; SDGs share many objectives with these transversal competences in the aforementioned degrees (Hernández-Barco, Sánchez-Martín, Blanco-Salas & Ruiz-Téllez, 2020). On the other hand, Hernández-Barco, Sánchez-Martín, Blanco-Salas & Ruiz-Téllez (2020) underline the possibility that theoretical content can be left behind, the lack of official procedures for students' evaluation and the fact that society can misunderstand students engaging in social services during academic periods as weaknesses. Moreover, several opportunities are highlighted including that knowledge is put directly in relationship with reality; stereotypes are deconstructed; SL responds to the search for new educative models and can be creatively adapted to global challenges (Hernández-Barco, Sánchez-Martín, Blanco-Salas & Ruiz-Téllez, 2020). Finally, the authors emphasize the risk for the syllabus to not being completed, the need for high-level coordination between teachers and social agents as main threats (Hernández-Barco, Sánchez-Martín, Blanco-Salas & Ruiz-Téllez, 2020).

## **2. Stakeholder and target group involved in the S-L institutionalization (by Silvia Mugnaini)**

### **2.1. Institutionalization of S-L at the university level**

The institutionalization of service-learning, at the university level is defined by the work and goals of several stakeholders (Bringle & Hatcher, 2000).

Jacoby (2014) dates to the 1990s and early 2000s, the beginning of the institutionalization of service-learning initiatives through the establishment of campus service-learning centers and the integration of service-learning into the curriculum. In their guide for the institutionalization of service-learning at the



University level, Santos Rego and Lorenzo (2018) suggest four steps for an effective institutionalization:

- 1) evaluating the context of the institution and that of the community;
- 2) designing an institutional service-learning program;
- 3) implementing of the service-learning program;
- 4) building assessment strategies from the very beginning.

On the other hand, Bringle & Hatcher (1996) propose to develop service-learning at the university level using the Comprehensive Action Plan for Service Learning (CAPSL). It identifies four stakeholders on which a program for service learning needs to focus for the initial efforts to be successful: institution, faculty, students, and community.

Bringle & Hatcher (2000) recommend institutions on how to develop service-learning on their campuses so that it becomes a meaningful aspect of faculty work, student life, institutional identity, and external partnerships. First, Bringle & Hatcher (2000) emphasize that institutionalization requires deliberate institutional planning, for instance by having a team at Campus Compact developing a campus plan. Second, the authors highlight the importance of developing campus infrastructure to support service-learning by having a centralized office that provides technical assistance, logistical support, monetary incentives, and recognition of the value of the work and outcomes resulting from service-learning. It also promotes regular strategic planning, discussions about service-learning on campus, and documenting service-learning. A centralized office can also assist in the professional development of faculty who teach service-learning classes or in the recruitment of second-generation faculty to service-learning (Bringle & Hatcher, 2000). The results of this research also support the expectation that placing a centralized office under the chief academic officer is advantageous to the institutionalization of service-learning (Bringle & Hatcher, 2000).

Salam, Iskandar, Ibrahim & Farooq (2019) performed a comparative analysis of current service-learning frameworks and identified common phases in all frameworks: planning, preparation, management, infrastructure design, implementation, reflection, and evaluation. Therefore, they argue that these common phases are obligatory for the successful implementation of service-learning in any academic discipline (Salam, Iskandar, Ibrahim & Farooq, 2019). Salam, Iskandar, Ibrahim & Farooq (2019) criticized the emphasis put on the institutionalization of aspects of service-learning in those frameworks and advocated instead in shifting the focus on reciprocal learning and academic outcomes.

Moreover, Furco (2001) offers three strategies for advancing service-learning institutionalization at research universities: 1) service-learning must be tied to the scholarly activities that research faculty value most; 2) service-learning must be tied

to the important academic goals and initiatives underway on campus, so to the academic mission of the institution; and 3) service-learning must be incorporated strategically into the disciplinary structure of the university. Furco (2001) also suggests that the campus administration must not view service-learning as a separate, independent program, but rather use it as a means to achieve the goals of broader academic reform initiatives taking place on campus.

## 2.2. International stakeholders (Integration of SL in Italy, Spain, Greece, and Portugal)

The methodology of service-learning has been firstly institutionalized in the United States' higher education (Jacoby, 2014; Sotelino-Losada, Arbués- Radigales, García-Docampo & González-Geraldo, 2021). In the US, the institutionalizing of service-learning depended on national organizations such as Campus Compact, American Association for Higher Education, Council of Independent Colleges, Council for Adult Experiential Learning, National Society for Experiential Education, National Youth Leadership Council, Partnership for Service-Learning, and the National Community Service Trust Act of 1993 (Bringle & Hatcher, 1996). Although its institutionalization is quite varied, service-learning permeates both educational practice and research in many universities, such as Maryland, Colorado, Indiana, San Francisco, or Duke, which have Service-Learning departments that organize and promote the activities of this learning method (Pérez Pérez, 2019).

In Latin America, there has also been a great theoretical and methodological development of service-learning, particularly in countries such as Argentina, Uruguay, or Chile. Its institutionalization has been consolidated by the creation, in 2005, of the Latin American Center of Learning and Solidarity Service (CLAYSS) (Pérez Pérez, 2019).

In Europe, service-learning has developed mostly in English-speaking countries (Sotelino-Losada, Arbués-Radigales, García-Docampo & González-Geraldo, 2021). Sotelino-Losada, Arbués-Radigales, García-Docampo & González-Geraldo (2021) talk of a two-speed Europe: one in which service-learning is consolidated (United Kingdom, Ireland, Spain, and Germany), and another group where it is emerging (Austria, Belgium, the Netherlands, and Portugal). The main international stakeholders that have advanced the development of service-learning in this area are the European Service-

Learning-Association (ESLA), the European Network of Service-Learning in Higher Education, the European Observatory of Service-Learning in Higher Education, and the International Association for Research on Service Learning and

Community Engagement (IARSLCE) (Sotelino-Losada, Arbués-Radigales, García-Docampo & González-Geraldo, 2021). Among institutions and legal regulations for the institutionalization of service-learning in Europe, the most relevant are: the Council for Citizenship and Learning in the Community; Service Learning: Dialogue between Universities and Communities (the Leonardo Project: CIVICUS); and Lernen durch Engagement (Pérez Pérez et al., 2019).

The European Observatory of Service-Learning in Higher Education has created a map of the Service-Learning Experiences in Higher Education across Europe based on voluntary submissions. According to it, there are eight experiences of service-learning in Italy developed between 2015 and 2020 among 5 universities: LUMSA University in Rome (4), Siena Italian Studies (1), Alma Mater Studiorum University of Bologna (1), University of Verona (1) and, IES Abroad Milan (1) (EOSLHE, 2022). Moreover, Portugal has nine experiences listed between 2018 and 2021 from only 3 universities: ISPA Instituto Universitário (1), Universidade Católica Portuguesa (7) and, Instituto Politécnico de Viana do Castelo (1) (EOSLHE, 2022). Finally, Spain accounts for the highest number of experiences traced thirty-nine between 2017 and 2021 among 20 different universities. Universidad Pontificia de Comillas emerges with 14 experiences registered (EOSLHE, 2022).

Along with its institutionalization, the academic production on the topic of service-learning is also uneven throughout Europe (Sotelino-Losada, Arbués-Radigales, García-Docampo & González-Geraldo, 2021). Sotelino-Losada, Arbués-Radigales, García-Docampo & González-Geraldo (2021) highlight the prominent role of Spain in EU publications, followed by UK and Ireland (Pérez Pérez et al., 2019).

At the national level, in Spain, the Spanish Service-Learning Network was created, which integrates and coordinates the different networks throughout the Spanish territory (Pérez Pérez et al., 2019). At the University level, the Service-Learning Network (Red Universitaria de ApS) was created, and there are several Spanish universities (of Navarra, Barcelona, Seville, Santiago de Compostela, or Valencia, among others) that are carrying out service-learning research and projects and taking considerable steps towards the institutionalization of this methodology (Pérez Pérez et al., 2019). Based on deans perceptions at Spanish universities, Pérez Pérez et al. (2019) identified that in regard to service-learning:

- the social responsibility held by the university institutions is recognized.
- deans have little, and, in certain cases, almost no knowledge about SL.
- there are a large number of members of the teaching staff who collaborate and share the development and implementation of learning projects.
- in the university context, there is a clear awareness that being useful to the community is necessary.

Similarly, Lorenzo Moledo et al. (2020) evaluated different service-learning experiences that are under development in 5 Spanish universities in regard to the degree to which these experiences meet the main pedagogical requirements of this methodology. The analysis shows the Spanish university system is at an initial phase in the institutional progress of service-learning as a methodology (Lorenzo Moledo et al., 2020). Lorenzo Moledo et al. (2020) suggest teachers' training to guarantee the adequate development of these experiences in the Spanish context.

In other terms, when talking about forestry, we also should take into account the concrete local and international stakeholders to work with directly. Of course, in the local context we will have forest associations, municipalities, fire fighters, community leaders, forest owners, and local residents but at the international level, we will find institutions that must advocate for conservation (such as UNESCO) or health (WHO), as well as international NGOs that might have a strong alliance to take the work ahead and make possible broad and useful projects.

### **3. Need analysis for implementation of S-L in forest management (by Glenda Galeotti)**

#### **3.1. Introduction**

In this chapter we introduce research taken place within the European project funded by the Erasmus+ program Facing Fire: Service-Learning to improve training and employability in wildfire management in Southern Europe (2021-ongoing).

Firstly, the research examines the effects of participation in interdisciplinary and international service-learning in forest fire management. It aims to understand the contribution of S-L in forest fire management for students' employability and the development of disciplinary and transversal skills (see chapter 4).

Secondly, it is an integral part of a broader research project which aims to define a S-L model dedicated to the prevention and mitigation of fire risk and recovery of post-fire areas. In particular, the broader study comprises the following three research trajectories:

- rethinking S-L as an employability device;
- understanding the potential of S-L to activate institutional innovation processes in HE;
- re-imagining the role of universities in society in general.

### 3.2. Qualitative research on S-L experiences of Facing Fire

Pursuing aforementioned trajectories means adopting a vision of S-L that goes beyond that of providing a service, including an educational experience, towards a perspective that embraces the idea of education enabling organizational and social transformation through the promotion of active citizenship, and transversal and disciplinary knowledge and skills to face the challenges of sustainability (Sotelino-Losada et al., 2021).

In other words, the analytical perspective in this study adopts the role of training device (Bernstein, 1990; Federighi, 2018) to read and interpret S-L experiences as an employability pathways. We use this category in an analytical-descriptive way to account for the three main rules – distribution, re-contextualization and evaluation – which underlie any educational experience, in order to understand its ability to guarantee access to opportunities for growth and development for the subjects involved (Bernstein, 1990). This category also makes it possible to identify the strategic elements for the training design of S-L, including focusing on the main dimensions that regulate relations – especially power relations – between the various components involved to guarantee the quality of the experience (Federighi, 2007).

Furthermore, the construct of employability defined in pedagogical terms is a process which at the individual level, includes personal growth and the development of skills as one of the key components of an employable person that is capable of navigating transitions and cultivating professional networks (Yorke & Knight, 2003; Boffo, 2020).

While some models of employability are based on approaches to teaching and intentionally developing components of employability within curricula and teaching practice (for example, the USEM model of employability takes into account four interrelated factors: understanding of subjects or academic disciplines, efficacy belief, metacognition and skillful practice using approaches throughout the whole curriculum, in the core curriculum, work- based and work-related learning and so on; (Yorke & Knight, 2006). In the age of technology and today's complex social-labor landscape, it is also important to emphasize the importance of relationships for developing employability (Dey & Cruzvergara, 2014).

Engaging students in meaningful experiences and relationships via S-L activities could help them explore and articulate their professional, academic, and personal paths post-graduation (Dey & Cruzvergara, 2014). The framework briefly described above allows us to place the object of the research within the ongoing scientific debate.

In brief, Service-Learning can be interpreted as an educational device capable of supporting employability pathways within higher education. This theoretical proposition informed qualitative research that aimed to collect students'

perceptions of their service-learning experience and the experts and professors' point of view about service-learning implementation in the four universities involved.

The collection of students' perceptions of their service-learning experience was done with in-depth interviews of 9 participants in S-L activities in Italy, Spain and Greece. The collection of expert and professorial points of view about service-learning implementation from the four contributing universities was realized with focus groups that surveyed 25 participants from Italy, Greek, Spain and Portugal organizations involved in the Facing Fire project. The research findings of first research action (interviews) confirm the positive relationship between service-learning participation and the development of key soft skills. The findings indicate how service-learning participation fosters labor market knowledge and skills, and opportunities for identifying and exploring academic and professional opportunities and cultivating authentic relationships.

On the other hand, the second research action (focus groups) intends to identify the needs of the various organizations involved and is concerned with the implementation of SL in forest management.

### **3.3. The main results on need analysis for S-L implementation**

The main objective of research activities conducted with the focus group was to collect data related to the needs for implementation of S-L in forest management. Discussion groups were conducted about two main issues: knowledge and competencies needed in the expert approach to deal with forest fires, and S-L implementation.

Two focus groups were led in July 2022 during a project meeting led by the University of Florence in Italy. The two focus groups involved experts, stakeholders and members of associations, professors from Spain, Italy, Portugal and Greece.

Focus groups involved 17 total participants: 3 from Portugal, 4 from Greece, 7 from Spain and 3 from Italy. Their expertise is centered on forestry and its management in the following streams:

- 3 master's degree students in education and forestry
- 3 secondary school teachers in environmental topics
- 4 members of forestry associations
- 7 university professors and researchers in education and forestry sciences.

Computer-assisted data analysis of the focus group transcripts was performed with the software Atlas.ti. The analysis generated 121 codes, corresponding to 7 code groups and 222 quotations (Figure 1).

<p>Primary documents: 2 Code groups: 7 Codes: 116 Quotations: 222</p>
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Figure 1

The focus group was structured around 4 questions dedicated to deepening understanding on the following topics:

- Skills for an expert approach in forest fire prevention and mitigation.
- Work with local communities and their role on fire risk prevention and mitigation.
- Knowledge and skills needed to develop the collaboration between university, other organizations and communities for S-L.
- Benefits expected.

The Figure 2 shows the code groups created for interpreting the data collected with the focus groups, with the related codes and quotations.



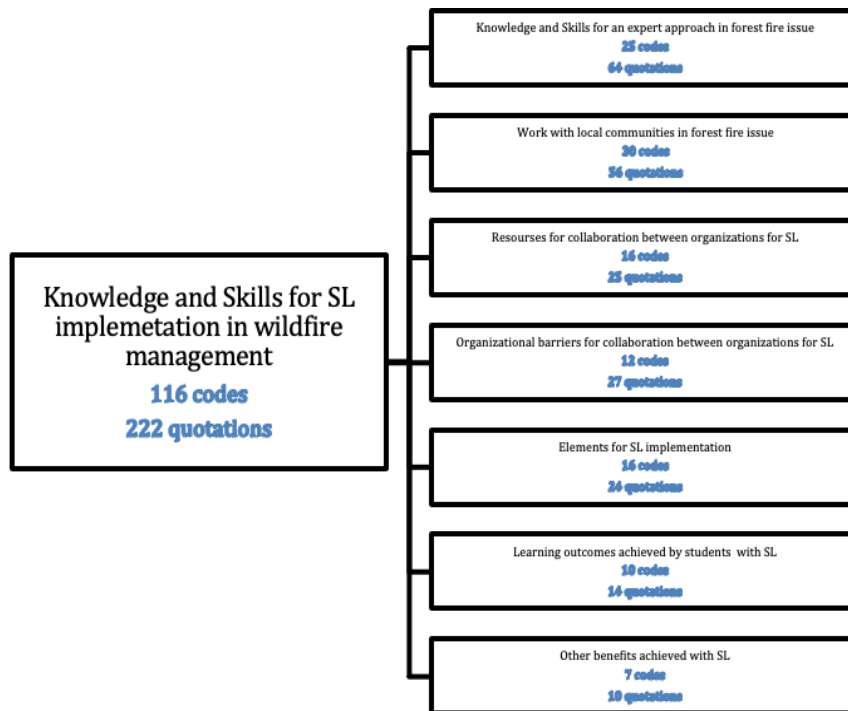


Figure 2

In regards to the first topic, the question of an expert approach to forest fire management refers to design interventions in professional fields of forestry studies, including the work with local communities, and how S-L courses could answer this need of knowledge and skill.

Data analysis underlines that the skills necessary for this expert approach in the prevention and mitigation of forest fires mainly relies on technical expertise, followed by communication skills, knowledge, analytical prowess (including an interdisciplinary and intersectoral approach), and for a social dynamic, community engagement.

The second topic concerns work with local communities as a strategic element in fire prevention and the contribution S-L can make in this task. The data supports that participants unanimously agree that working with the community is intended to engage full participation in forest management activities. Specifically, this work with local communities should be done through:

- creation of strong relationships
- connection between action and values
- collection of varied voices, interests and perspectives
- community education
- creation of collaborative setting/space
- direct involvement of communities in the processes



- view of students participating in S-L as a bridge between different worlds.

Focus group participants thought that developing collaboration between universities, stakeholders and communities for S-L requires different kinds of resources. First, there is a need for interdisciplinary and intersectoral collaboration that is capable of promoting change in conjunction with the organizations involved. Second, we need professionals that can face collaborative challenges with robust and empathetic communication skills. An issue that can arise with a collaboration for S-L of this scope does need to overcome various obstacles, such as bureaucracy, student recruitment, lack of funds, and so on. According to the participants in the focus groups, the S-L implementation requires work on educational methods, the change of the evaluation paradigm adopted in HE, the learning objectives expected and achieved, and the streamlining of procedures.

The last question is about the benefits expected or experienced by the students' participation in S-L.

The main learning outcomes gained through participation in S-L experiences promoted by the Facing Fire Project concern the acquisition of an interdisciplinary and complex understanding on the issue of forest fires and acquisition of skills to educate the community and/or specific groups. Other associated benefits achieved with S-L activities are linked to research development, the identification of new needs, and the activations of networks for development of new collaborations.

## **4. Output and outcomes of S-L for prevention and mitigation of wildfires (by Chiara Clemente)**

The first part of this section is dedicated to a brief overview of the theoretical basis for investigating learning outcomes related to knowledge, skills and employability as a result of participation in S-L. After this introduction, the section will then introduce the findings of an exploratory study conducted within the context of the Facing Fire project. This study specifically examined the effects of students' participation in Facing Fire S-L activities on soft skills and plans for the graduate transition. The results allow for a more informed understanding of learning outcomes in the context of interdisciplinary and international S-L activities in fire mitigation and management.

### **4.1. Introduction**

Thanks to decades of theoretical and empirical research on S-L in higher education settings, it is possible to affirm the positive effects of participation on students' sense of civic responsibility, subject-specific and transversal learning, self-efficacy and personal and professional growth (Astin, Vogelgesang, Ikeda, & Yee, 2000; Smith, Sturtevant, Bullough, & Stanworth, 2019). In response to this research, the scientific community has been interested in the connections between S-L and the development of students' skills. Recent studies have investigated learning

outcomes in terms of disciplinary knowledge and skills (Hart, 2015) as well as soft skills (Holmes et al,2022; Malinin, 2017), including those related to employability pathways (Santos Rego et al., 2022). In educational terms, employability refers to the complex process of developing skills and capabilities to successfully navigate the labor market, manage transitions, find and maintain meaningful employment and autonomously manage one's professional path (Yorke & Knight, 2003; Boffo, 2020). In addition, cultivating authentic relationships and engaging in meaningful experiences during university are also key components of exploring and developing professional, academic and personal paths post graduation (Dey & Cruzvergara, 2014).

With specific reference to soft skills, empirical research on S-L to date has found positive relationships between S-L participation and the development of key skills such as communication, teamwork, leadership and more (Astin & Sax, 1998; Eyler & Giles, 1999; Simons & Cleary, 2006; Bornatici & Vacchelli, 2021; Santos Rego, et al., 2021; Santos Rego et al., 2022). Moreover, S-L participation is found to have a beneficial effect on building relationships with peers, faculty and the community (Simons & Cleary, 2006; Mitchell & Rost- Banik, 2019, Bornatici & Vacchelli, 2021). S-L has been identified as a high impact learning practice (Kuh, 2008) and as such, has the potential to be influential for students' career development (Zunker, 2016). According to Kuh (2008), high impact learning practices prepare students for 21st century challenges by developing:

- “knowledge of human cultures and the physical and natural world”;
- “intellectual and practical skills, including inquiry and analysis; critical and creative thinking; written and oral communication; quantitative literacy; information literacy; teamwork and problem solving”;
- “personal and social responsibility, including civic knowledge and engagement - local and global; intercultural knowledge and competence; ethical reasoning and action; foundations and skills for lifelong learning”;
- “integrative and applied learning” (ivi, p. 4).

Building on and synthesizing years of previous research, Kuh (2008) presents compelling quantitative data which paints a picture of the effectiveness of S-L (among other high impact practices) which can be attributed to factors which differentiate the learning setting from the traditional classroom experience in several ways:

- S-L requires that students dedicate time and effort to meaningful activities which foster a sense of commitment and require more frequent interactions with faculty and peers;
- The nature of S-L requires that students interact and collaborate face-to- face with faculty and peers, often for prolonged periods of time such as a semester or academic year, which sets the ground for developing authentic relationships;

- Students are likely to encounter diversity by participating in S-L (i.e. interaction with people who have different life experiences and ways of thinking) which sets the stage for developing new perspectives;
- Due to the proximity and more frequent interactions with faculty and other mentors, students receive more frequent feedback (formal and informal) on their work;
- S-L gives students the opportunity to make connections between classroom learning and real-world settings, and develop understanding of their beliefs and actions within a broader perspective (ivi, p. 17).

#### 4.2. Facing Fire case study: From S-L activities to outcomes

Using the theoretical and empirical research illustrated as a point of departure, an exploratory research design was developed to investigate the effects of participating in Facing Fire S-L on students' employability pathways. Research was conducted in 2022 using a single-case study (Yin, 2014) and qualitative methods. The aim was to obtain rich and detailed testimonies from student participants which could reflect their subjective, lived experiences engaging in S-L. Data was collected via nine in-depth interviews with students from Spain, Italy and Greece. This sample represented approximately one fifth of S-L participants in Facing Fire as of November 2022. Given the interdisciplinary nature of the Facing Fire S-L design, the sample included students from diverse areas of study: forestry and agriculture (4), geology and geomorphology (3), biology and chemistry (1), and education science (1). Computer-assisted data analysis of the interview transcripts was performed with the software Atlas.ti. The analysis generated 44 codes corresponding to three code groups and 358 quotations. (Figure 3).

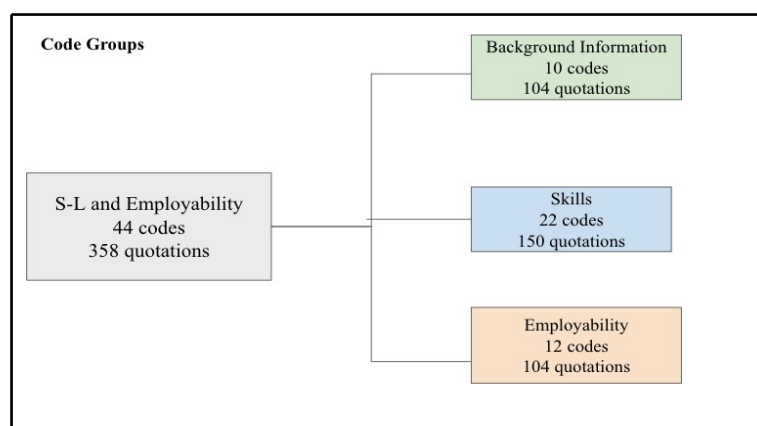


Figure 3

In terms of background information, it emerged that students had participated in different types of S-L activities: direct, indirect, advocacy, research (Berger, 2003) and planning (Tapia, 2020). The most frequent type of S-L activity was

research, in which students collaborate with faculty and the community to gather and analyze information on local problems with the goal of helping the community improve their response. Examples include qualitative and quantitative data collection about the community's response to fire events as well as field surveys of fire-affected areas. Direct S-L was the second most cited activity and included direct service to local schools (i.e. conducting hands-on activities with pupils about the forest). In terms of student engagement, detecting planning activities was significant as this signaled that students had opportunities to co-design and co-plan activities alongside faculty and community partners. Finally, all of the students interviewed reported engaging in an international experience or dimension as part of their S-L involvement, such as mobility to a partner university, working with students from different countries and participating in the activities of one of Facing Fire's international conferences.

The second group of findings are related to students' perceived skill gains. During the in-depth interviews, students were asked to reflect on perceived gains in terms of soft skills and subject-specific learning. The COMGAU Generic Competency Scale (Regueiro et al., 2021) was used as a point of reference for groups of skills and their definitions. This scale identifies five competency groups: interpersonal skills, intercultural ability, digital collaborative skills and analysis and summary skills. All of these were detected in the data, however, interpersonal and intercultural skills had the highest frequencies. The interpersonal skills group is comprised of skills related to social interaction: oral and written communication, the ability to negotiate effectively (including in teamwork settings), and the ability to present products, ideas and reports in public (Regueiro et al., 2021; Santos Rego et al., 2022). Intercultural skills refer to "basic general knowledge (general culture), the ability to write or speak in other languages, the ability to work in an international setting, and knowledge of cultures and customs in other countries" (Regueiro et al., 2021, p. 14). According to students, working in groups with peers from diverse disciplinary and country backgrounds was the main stimulus for perceived gains in these areas. To cite two examples:

"Sometimes we have different perspectives about the same subject. Here [in my country] we always do the same activities and we know how it works. In my team, I listened to others and other activities and ideas, and I had never thought about that. They can work";

"We had to communicate with people from other countries and give a speech in English, and communicate with them in English. It forced us to use a different language and I feel quite confident".

In addition, students reported self-reported gains in subject-specific knowledge and skills. Forestry was detected most frequently in the data, however, educational sciences, biology, chemistry and geology were also present.

The investigation of skills also revealed two self-reported learning outcomes which emerged from the data (bottom up):

- training needs-self analysis, or, in other words, students utilized their S-L experience to reflect on and identify personal learning needs and training gaps;
- interdisciplinary vision, the ability to cultivate and act upon a shared vision with group members from diverse subject backgrounds “with largely non-overlapping training and core expertise to solve a problem” (Cech & Rubin, 2004, p. 1166).

Examples of students expressing interdisciplinary vision learning gains include:

“We were used to our team in our subject, and then we moved to another completely different atmosphere with [forestry] engineers, education students, etc. and it was good to see different points of view and to learn skills of how to socialize or how to express our opinion and see different types of views”;

“It’s [the problem of wildfires] more social, something that us foresters... I mean, it’s not just forest management [...] but a human aspect. It’s not that you manage the forest by cutting certain plants or not, but you manage it also by working with people who live nearby and analyzing aspects from diverse angles”.

The finding of training needs self-analysis is significant because it suggests that reflecting on the experience of S-L can stimulate plans for learning and professional development beyond and outside of the S-L experience itself. Interdisciplinary vision is an important finding because it signals that a team is integrating diverse collective knowledge and skills to face a complex problem and that group members themselves are also enriched by new perspectives (Prokopy et al., 2015). According to experts in natural sciences and adult education fields, interdisciplinary science/vision/collaboration is a essential for facing socio-environmental challenges in the 21st century which are not solvable by a single scientific field or discipline (Goring et al., 2014; Prokopy et al., 2015; Galeotti, 2020).

With respect to the last group of findings, students reported that participating in S-L had beneficial effects on knowledge of the labor market and professional, academic and personal plans. The data indicated that as a result of direct and sustained interactions with professionals and faculty during S-L, students were able to increase their awareness and knowledge of professions related to their field of study (mostly practitioners but also academic and research trajectories). They also reported obtaining general knowledge about the world of work connected to forest fire prevention and management. It is important to note, however, that these findings were not universally detected in all interviews. Some students reported that the knowledge of the labor market and professions obtained through

S-L did not represent new information to them or was not in line with their field of study.

Another significant finding related to navigating professional pathways was that students reported that S-L participation affected their academic and professional plans. In terms of academic plans, the data revealed that S-L participation afforded students opportunities to identify and develop plans and ideas for research (i.e. choice of topic for final degree project), plans for continuing education (i.e. enrollment in a Master's) and professional development (i.e. internships) in line with the S-L topic. Lastly, data indicated that participating in S-L helped students develop relationships with professors, professionals and peers. This finding is significant also because students reported using this social network as a resource for obtaining professional and academic guidance, advice and support.

Overall, students expressed positive impressions about S-L's potential to boost connections between university studies and real world applications (theory and practice) in order to support students' professionalization. In the words of two students:

"Between academics and the application of this knowledge there is a world between and no one really teaches you how to take your knowledge and apply it to something real. I think with this connection you can have better professionals";

"In the last year of a bachelor's degree it [S-L] allows students to make a more informed choice of master's degree. It's one thing to read about the courses that you will have to take. It's another thing to experience the professional realities of that speciality. That allows you to have more knowledge and information".

### **4.3. Key takeaways from the case study**

The results of the case study provide insights on how students involved in S-L applied to forest fire prevention and mitigation perceived the effects of their S-L participation on soft skills and professional pathways. Participation had positive effects on learning in the areas of the competency groups defined by

COMGAU (Regueiro et al., 2021). In addition, participation had positive effects on academic learning and social capital (Santos Rego et al., 2018). Gains in these areas are in line with previous empirical research on S-L.

The novel findings of the case study which have not been mentioned by previous studies dedicated to S-L relate to interdisciplinary vision. According to the students interviewed, interdisciplinary vision was an important outcome of the S-L experience because it enabled them to integrate their technical preparation with a social vision of the problem of forest fires. From a practical point of view, students



reported improved knowledge and abilities for working with communities affected by this problem. Moreover, one of the students connected interdisciplinary vision with a renewed role of universities in society:

“I think universities must train technical professionals with a very precise social vision. I think more and more we are realizing that it's not enough to remove the problem after a fire event occurs. We must understand the structure that allows this to continually happen year after year. And this is the role of the universities, to train us for that. We need professionals, but with interdisciplinary vision about their subjects.”

With respect to forestry professions/professional profiles, this reflection suggests that S-L can help address the need to develop skills for effective community engagement, community outreach and citizen education.

This statement opens the possibility to reflect on organizational/institutional related outcomes that S-L help cultivate, namely re-thinking and redesigning the relationships between universities and civil society. At the level of students' employability, collaborations between universities and the local territory to offer experiential learning opportunities would boost the mechanisms available to connect theory and practice (as noted by the literature on S-L). In addition, S-L could be thought of as an avenue to pursue community-based collaboration and engagement of stakeholders for addressing complex socio- environmental challenges such as forest fires (Păunescu, Lepik, & Spencer, 2022).

It cannot go without mention that assessment of outcomes is an essential practice for measuring and understanding the effectiveness and effects of S- L projects and activities. Portfolios are a recommended method for assessing student learning outcomes in the context of S-L (Kuh, 2008). In fact, the literature most commonly addresses assessment practices related to the student dimension, however, given that S-L involves providing a service to the community, it would also be desirable to devise ways to measure the social impact of these activities on the target community.

## **5. Towards a S-L model to fight forest fires (by Glenda Galeotti)**

The overall aim of the European project funded by the Erasmus+ program “Facing Fire: Service-Learning to improve training and employability in wildfire management in Southern Europe” (2021-2023) is to encourage social engagement among students to improve capacities in forest fire management by introducing the S-L in areas impacted by wildfires. This objective is pursued through the development of international training projects that involve students from different European countries and various degree courses – (education, forestry,

communication, geology and geomorphology, agriculture, chemistry, biology, engineering sciences, etc.) – with the objective of gaining academic knowledge that can be applied to generate positive change in the community and on students' employability (Ramson, 2014; Santos Rego et al., 2015).

The S-L experiences that have taken place within the Facing Fire project involve universities, research and vocational training centers, local authorities, forestry organizations, etc. of the European regions most prone to forest fires: Spain, Portugal, Italy and Greece.

The training projects follow an interdisciplinary and international approach, and are focused on implementing initiatives for the prevention and mitigation of fire risk and for post-fire recovery.

In addition, Facing Fire represents an opportunity for the partner universities to verify the conditions for institutionalizing S-L as a permanent training proposal to support students' professionalization and employability processes. This verification process is also sustained by reflecting on the organizational methods necessary for the activation of S-L and, more generally, on the role of the university in and for society.

The S-L proposal begins by assessing concerns about the severity and urgency of the environmental problems in the community. This is then parlayed into work dealing with learning and skills development that can provide new solutions. It is through direct feedback that perspective on the issue can be gained, along with ideas on how to address it. As well, it can engage local communities and larger society to collaborate and take part in problem-solving processes. In this way, we argue that the S-L project acts as an educational tool for improving forest management.

Service learning is an educational device that allows the development of responsibility and capabilities thanks to the integration between learning and action, between community service and academic activities.

In other words, the students interact directly with the issue (direct feedback) and they contribute to the fostering of new knowledge in conjunction with local agents. This kind of process creates societal impact through learning activities while promoting learning through social participation

The main steps for implementation of S-L and their institutionalization:

- 1) analysis and evaluation of the institutional and territorial context of intervention, also involving the stakeholders
- 2) designing/co-designing S-L programs
- 3) implementation of the S-L programs and activities



- 4) definition and application of evaluation and assessment strategies and tools.

The experimentation areas of S-L experiences are the following 4 European territories:

- Municipalities of Quiroga and Taboada, Galicia (Spain)
- Monti Pisani area, Tuscany (Italy)
- Municipality of Sever do Vouga Aveiro district (Portugal)
- District of Afidnes, Attica Region (Greece)

The process of S-L design considers the following main elements and dimensions:

- Local needs
- Partnership/stakeholders
- Objectives
- Design and implementation of S-L as an educational proposal:
  - Learning outcomes
  - Activities in the field
  - Recognition and Evaluation
  - Evaluation and follow-up sessions

Moreover, these experimentations of the Facing Fire S-L project explore different methodology and action, but are all dedicated to the involvement of different stakeholders (Figure 4) and the integration between project objectives in forestry and in education, considering not only the formal dimension of education but also the informal ones (Figure 5).

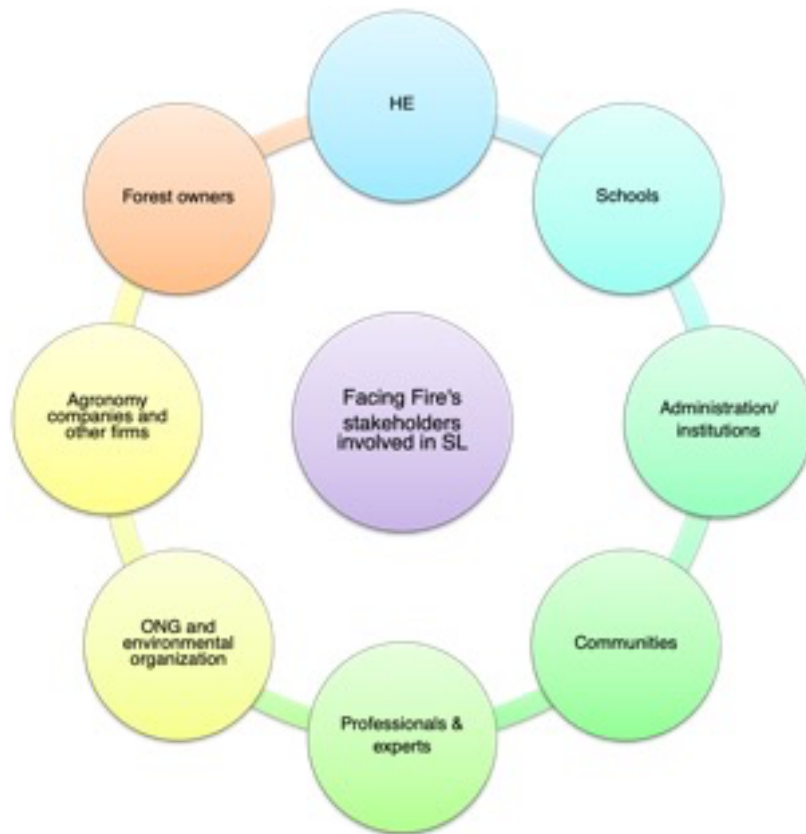


Figure 4

Subject	Forest sciences	Education sciences
<b>S-L objectives</b>	<p>Reducing the risks of fire and implementation of best practices of restoration.</p> <p>Planning risk reduction, damage estimation in natural and anthropogenic environment, risk mitigation plan.</p>	<p>Raising of awareness concerning the environmental challenge of wildfires.</p> <p>Increasing the community perception of the problem of forest fires.</p>
<b>S-L activities</b>	<p>Students make a map of stakeholders and clusterize them.</p> <p>Field studies carried out with undergraduate/masters degree students.</p> <p>Students participate in preparation of risk prevention, mitigation, and restoration plans.</p>	<p>Students involve children, youth and adults in the educational and cultural activities in the site of forestry interventions.</p> <p>Students perform field demonstrations, cultural and scientific activities.</p> <p>Students produce education and communication materials.</p> <p>Students collect data for the analysis of community needs.</p>

Figure 5

With regards to the training proposed, S-L experiences engage students in real-life cases, practical experiences and specific problems in the community with the aim of increasing their disciplinary and transversal skills and developing their employability.

Moreover, in accordance with a community-based educational paradigm (Naval & Arbués, 2016), the S-L projects aim to meet the needs of the community involved by way of updating and developing the knowledge and skills of all stakeholders (technical, procedural, and scientific progress). In addition, Facing Fire represents an opportunity for the partner universities to verify the conditions for institutionalizing S-L as a permanent training proposal to support students' professionalization and employability processes.

From the experiences realized, we are working to define an S-L model for fighting forest fires. It is based on three main dimensions (Figure 6):

- a. The interdisciplinary and intersectoral approach in facing wildfires as a complex problem that requires not only activities for restoration and prevention but also community awareness, capacity building, considerations of the implications at the different levels (individual, interpersonal, community, organizational and policy/ environmental) and areas (economic, social, educative, environmental and so on).
- b. Consequently, our S-L projects have to provide different levels of interventions based on their prioritization from institutional considerations to management of risks and their perception, including the access to and enhancement of knowledge and skills present in broader society.
- c. Therefore, the relationship between HE and society may be re-examined through Citizen Science that foresees the adoption of a horizontal and collaborative perspective and the inclusion of different kinds of resources.

Following this thread, S-L could contribute to the social responsibility of universities with the integration of their three missions: didactic, research and community leadership.

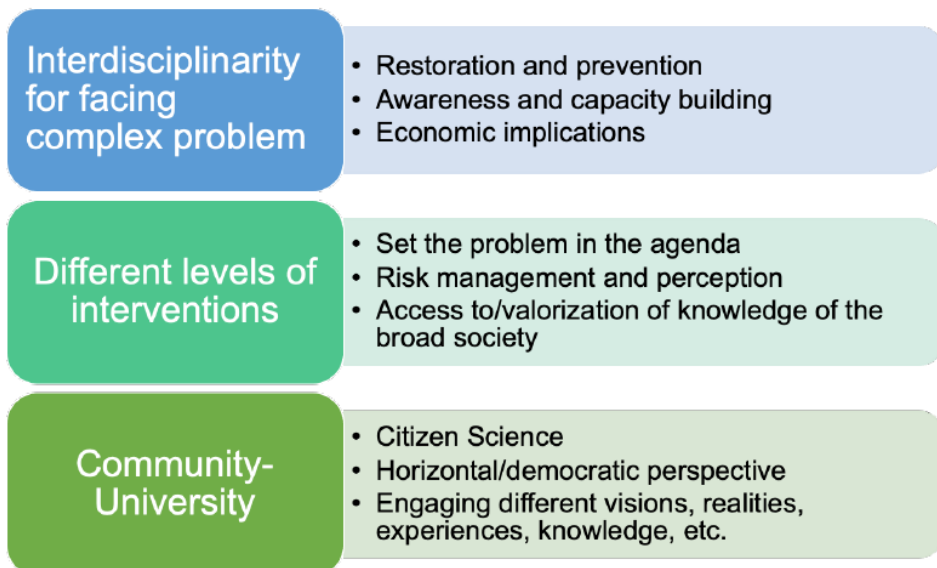


Figure 6

The work of the S-L model for wildfire prevention and mitigation underlines the following aspects:

- Clear identification and definition of expected learning outcomes, validated with local communities and consistent with the professional skills expected from degree programs.
- Consolidation of the co-designing phases and structure of activities with local communities and stakeholders and of the operative co- designing with the students.
- Definition of the role and functions of the various stakeholders (external to the university) to support the learning process of students and the problem-solving processes.
- Definition and implementation of an assessing framework of the learning outcomes achieved by students and their formalization and the interventions with and for community stakeholders.

The issues proposed in the model assume a frame of reference that the LOs established ex ante. They represent a guide in the S-L co-design phase to foster self-directed learning processes and the basis for the definition of assessment models and the framework of evaluations, learning processes and professional competencies achieved.

Therefore, we follow a holistic framework for the evaluation of learning outcomes based on performance and products of the students, using an evaluation rubric and a portfolio for the collection of documents produced by students.

## **6. Guidelines for the transferability of S-L for prevention and mitigation of forest fires (by David García Romero)**

Since Service-Learning is an educational paradigm that focuses on the relationship with other social agents (Sotelino et al., 2022), it is of key importance to not only examine its direct impact, but the transferability of the work to broader layers of society and the transferability of the methodology to stakeholders. Both things will contribute to the impact and sustainability of S- L actions.

The aim is that the ideas and procedures developed through S-L influence other social actors through the common work. As McMillan, Goodman and Schmid (2016) defend, S-L is a hybrid space, where two different systems must negotiate and, therefore, it opens the possibility of important changes both in university and other actors in society.

Transferability, therefore, goes in both ways. University transfers knowledge and technique that are useful to prevent and restore the ecological damage of forest fires, but other actors (NGOs, local communities, fire fighters...) provide to the

educational institutions useful knowledge that steams from concrete situations and procedures that guide students' competence.

But, more importantly, both kind of actors must learn how to perform S-L, which corresponds to bidirectional transferability of know-how. In this sense, there are five elements of S-L that must be developed in order to ensure this beneficial transferability: Work with local agents, Interdisciplinarity, Methodological diversity, Legitimate Peripheral Participation of Students, Mutuality on objectives and work.

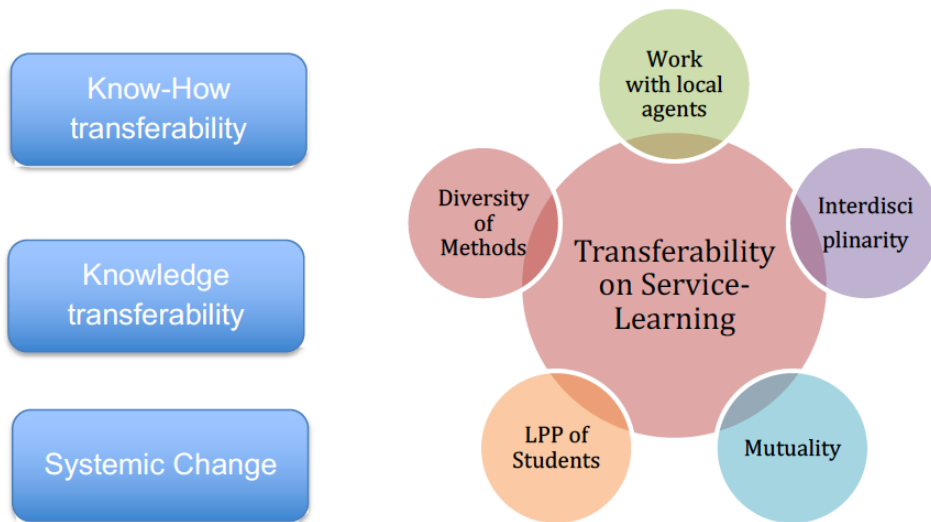


Figure 7

**Working with local agents:** In the case of environmental issues such as forest fire management, the territorialization of the work is paramount (García-Romero & Salido-Herba, 2022), therefore, the work with local agents is key for transferability since they are those that can find usefulness on the knowledge that universities provide, and also point to knowledge that is not already recognized by academia which can indicate new lines of research (García-Romero & Lalueza, 2019). These local agents must be diverse, and include forest owners, who have the possibility to act, municipalities, that can legislate, and also schools and journalists, that are those that can spread consciousness and know-how on broader populations.

**Interdisciplinarity:** Real problems are rarely affordable from just one discipline. At the same time, the transferability of a concrete set of concepts and procedures of one discipline will have few effects on territory and also in the populations' capacity to fight ecological damage, so the sense of learning would be compromised. Therefore, the transferability to inhabitants will be need to be

interdisciplinary or transdisciplinary (García-Romero & Salido-Herba, 2022), in order to be able to see the big picture and the components of the problem. But maybe most important, that interdisciplinarity will ensure that students and teachers of diverse disciplines learn from each other, and so knowledge of one discipline can catalyze the knowledge on others and vice-versa, creating a process of a deeper understanding of forest fires and how to prevent and restore forest ecosystems.

**Methodological diversity:** In a similar way of interdisciplinary, methodological diversity will be an element of ensuring transferability, since it will open the doors of the participation of different social actors. It should involve both the methods for evaluation and scaffolding of student's learning and the methods of intervention in territory and community (Lorenzo Moledo et al., 2021). The narrower and fixed the methods are, the more difficult it will be to participate for agents that are not familiarized with them. That is why, even art (maybe land-art, in this case) has been defended as a good way of fostering the potential for dialogue of S-L (García-Romero et al, 2021). In any case, diversity of methods, as long as those methods are shared, open the way to participation, which is basic to transferability (Clifford, 2017).

**Legitimate Peripheral Participation of Students:** Students are the key agent of S-L (Santos-Rego et al., 2022). They are the pivotal components between all the different agents, as they will participate with the most diverse sets of groups. That is why, their legitimate participation is key for transferability, only through a recognition of the student's knowledge and competence, will collaborating agents place value on what can be transferred. This legitimization is never, or rarely, discernible in the initial stages of S-L. Students must take part from an initial peripheral participation to a later more pronounced contribution. This transition ensures that they will gain appropriate knowledge from the community and university while transferring the expertise they have gained through interactions with other agents (García-Romero et al., 2021). In a sense, we are discussing trustworthiness: it is only from a position of trust

that students can share their knowledge gained from one agent and share it with another, transferability can be real and bidirectional.

**Mutuality:** Last but not least, we must take into consideration that in order to acquire any kind of knowledge or know-how, we must have an interest in resolving a problem, a goal for our action (McMillan et al., 2016). Therefore, transferability to any kind of social agent needs engagement with an objective. In S-L cases dealing with forest fires, those objectives will be related with the population's attitudes towards fires and ecology, the prevention or restoration of ecological damage and/or the training of students. In any of these cases, transferability would need that the agent that can acquire what is transmitted, and the agent that provides it, share the same objective, since this way they are at the same point,



sharing something that is valuable to both, and then worthy to share/learn (Clifford, 2017).

We conclude, then, putting the focus in the fact that Service-Learning in Forest Fire Management will not be just a field of exchange, but a territory (figuratively and, hopefully, also literally) where different social agents mutually learn and act to deal with one of the most serious ecological problems of our time (Souza et al., 2023), while training future professionals along the way. All partners in the Facing Fire Project have worked to follow these guidelines as we discovered their importance however, critically, we are willing to continue working on them throughout the years while expanding our partner network.



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