

### What is service-learning?

Service learning is defined as *"a teaching and learning strategy that links community service and instruction to enrich learning, teach civic responsibility, and strengthen community service"*.

Service learning is an active learning strategy in which the participants have to use their previously acquired knowledge for the development of teaching material and communicate about it to a non-informed community.

As service-learning involves both university students and the general public, it is an effective tool to connect science and society, in which all concerned parties, i.e. the scientific community and society, all gain from the approach.

For academic students, the idea behind service-learning is that turning knowledge and skills into a practical activity is key to the consolidation of the knowledge acquired during their academic studies.

For society, the aim is to provide citizens with the tools to understand the role of science in societal challenges such as the climate and biodiversity crisis, as well as future pandemics.

Service-learning projects are diverse and vary depending on the target audience, the targeted objectives, and the academic field in which they take place. To maximize its effectiveness, service-learning must be used to directly communicate about societal issues in which both the scientific community and the target population have a common ground of interest. In the case of microbiology, there are a myriad of topics that can be addressed: food production or food spoilage, organic matter recycling, wastewater treatment, microbiome research and personalized medicine.

### To keep in mind before developing your own activity

1. Choose the topic.

First of all, you need to consider what societal problem the students will address. It is also good to keep in mind which target group you will work with later. As an example, in our project we have chosen the topic "the bright and the dark side of microorganisms", in other words to compare the negative side of microbes (e.g. diseases, food spoilage) to their positive side (e.g. drug discovery, bioremediation).

2. Contacting the target audience/institutions to work with

Once the topic has been determined, institutions to work with and the target audience can be contacted to see if / how much interest there is in participating in the activities.



### 3. Preparation of the topic

Since the students are supposed to pass on their own knowledge, it is best to adjust the topic to previously acquired knowledge and only to involve minor acquisition of new knowledge.

### 4. Age of the target audience

The younger the target group, the simpler the information has to be packaged and the more playful the activities should be. Consider also the timing, how long should each interaction between the provider and receiving audience last? You also have to consider whether all students will work with the same age group or whether a certain range of age groups offers more opportunities to prepare the material in different ways.

### 5. Make room for specific individual topics

If you are coordinating more than one group working in your service-learning activity and want to cover different target groups, the previous knowledge/age range of each target group is important for the definition of specific topics that each group will develop for the activities.

## Starting your own service-learning course

### 1. Time to be invested

You have to plan to have enough time for the following steps:

- a) Presentation of the overall concept to the students and time to get to know them. Let them enough time to shape their concept of activities and accompany them through their reflections.
- b) Selection of the specific topic(s) within the general societal issues and definition of the specific target group.
- c) Presentation of the planned activities by the students for the course supervisors and schoolteachers to obtain feedback and adjust/improve the activities.
- d) Preparation of the actual activities:  
Elaboration of the didactic material and preparation of a planning
- e) Service-learning:  
Actual work with the target audience
- f) Final presentation:  
Feedback among participants to the course (university students, academic coordinators and school teachers).



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### 2. How many credits to give?

The number of credits that the students receive for successfully completing the course depends on the time invested. In our case that was 28 teaching hours, which corresponds to 3 of the European Credit Transfer System (ECTS).

### 3. Planning

It is important to create an accurate schedule in which all the work steps are planned to ensure that the project can be carried out in full.

Indicative planning, we used for a one-semester (i.e. 14 weeks) activity:

- Selection of specific scientific topics of societal interest (4h, over month 1), including an initial discussion with teachers to guide your students in the topic selection.
- Presentation of proposed activities to peers (4h, over month 1): discussion of the complexity of the activities, allowing time for exchanges among participants.
- Preparation of the activities (8h, over month 2), that is preparation of the teaching materials and how to plan the activities in time.
- Service learning itself (10h, over month 3): working with students, in their classrooms, on university premises, or in the field.
- Final presentation (2h) to allow feedback between the participants.

### 4. Communication with the public

When the course is completed, the elaborated activities can be made available to a wider audience. For this, inform your students in advance that they should hand-out their activities in an almost “ready-to-use” format. Then, in order to make the content available, this can be made through a homepage (with or without password), content can be uploaded to social media platforms, or, for example, workshops can be organized. Depending on the form of the developed activities, instructions, videos, collections of ideas, etc. can be made available.

Our experience showed that social media are a suitable platform to communicate around the activities and promote the program (i.e. through pictures or videos), although the creation and distribution of these contents require to hire an assistant for communication and coordination.

## Putting your course in a curriculum

### 1. Adapt to the curriculum

Adapt the calendar of the course to the curriculum of the students you will involve. Is it a one semester or a two-semester activity?

Consider also whether you want this course to be mandatory or elective. In any case, the students must have the opportunity to add this course to their academic path.



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### 2. Learning objectives

After completing the service-learning course, students should be able to:

- a) Communicate a scientific (or academic) message in a clear and concise way with a non-academic public (e.g., avoid jargon, use of simple words and illustrative language).
- b) Apply the knowledge acquired during the theoretical lectures in the development of pedagogical activities. Conceive, plan and carry out these activities in an independent manner.
- c) Explain and illustrate phenomena specific to your academic field in a simple way.
- d) Develop a “playful” activity without missing scientific rigor.
- e) Evaluate the effectiveness of their knowledge transmission.
- f) Develop critical scientific thinking.
- g) Work efficiently in a group.
- h) Communicate adequately with teachers and pupils.

