

How to manage a successful Summer School

Lessons from our “Educational Network on Soil and Plant Ecology Management (EduSaPMan)” and improvement strategies within a multidisciplinary, international approach on teaching soil and water ecology

Introduction

Enhancing internationalisation across Europe has been a major concern of the European Union in the last years. This internationalisation has different facets, from Erasmus Student Exchanges to Double Degree Masters or abroad internships.

Summer Schools are also part of this internationalisation strategy. Summer Schools are originally known from the United States as additional education programs during the summer months. They served to remediate learning deficits or just as an “entertainment program” in the school-free time (Cooper et al 2000). These days in Europe, Summer Schools are known in a much broader sense. They comprise advanced training programs for all educational levels, from schoolchildren to students and post-graduates. One or more topics (often language training) are covered in a limited amount of time (normally 1 – 6 weeks time).

There are different challenges that might occur within a Summer School. These will be explained more detailed in the following parts. In general, the main problems arise in the context of organisation and teaching in a way, that it fits the needs of short-term intensive education. Further, the overall high workload within a Summer School can lead to difficulties.

Our Summer School “Soil and Water” is a so-called “Learning, Teaching, Training Activity” within the Erasmus+ Strategic Partnership: “Educational Network on Soil and Plant Ecology and Management” (EduSaPMan). It covers different topics that are all related to soil ecology. It developed out of a Summer School within an Erasmus+ Intensive Program running from 2012 - 2013. The overall aim of our Summer School is to enhance the knowledge in the field of soil and water ecology, give confidence to talk in a foreign language, improve general skills like giving a presentation and give insights into working on an individual research topic.

The “Soil and Water” Summer School has some outstanding features that sets it apart from other Summer Schools. It is held in one of the four participating countries (Germany, Czech Republic, France and Estonia) every year and the lectured topics are always related to the respective ecosystems and research facilities. Therefore, it fits also into the context of so-called place based education, as excursions in the different areas and practical work are always part of the Summer School (Smith 2002).

The students who originate from at least four different countries all have different study backgrounds (e.g. Biology, Agricultural Sciences, Forestry and Ecology) and different levels of education (Bachelor, Master and PhD-Students). Additionally, none of the participants, neither students nor teachers, have English as their native language. For these reasons, the successful performance of our Summer School is a big challenge and to create a good learning atmosphere and good outcomes, organisation has to be carefully considered. This publication is meant to give ideas of how to manage a successful Summer School, what problems might occur and what we learnt from several years of performance and improvement.

Organisation

General Organisation of a Summer School

Usually, participants of a Summer School do not know all of the other students and teachers. As they will engage in several days of close work, it is necessary to get to know each other to have a pleasant learning atmosphere. We realized that a so-called “Ice-Breaking Event” is appreciated by all participants and it should be scheduled even before the actual lectures begin. An interesting idea is to ask the different nationalities to bring some country-specific food or drinks to this event. The creation of a pleasant atmosphere should be a major concern of all Summer Schools. Contributing to that, also social events should be included in the schedule. It is especially important that also teachers should find the time to join and connect to the students. These social events do not have to be in any way fancy – sharing a pizza with all participants in the evening or organising an ordinary BBQ meets everybody’s expectations (see Fig. 1).

When planning the accommodation for the students, we suggest to finding a place with a common room that can house all students. This gives the opportunity to spend time together after the scheduled program and it can also be used for group work. We do not recommend separate housings as it splits up the group and complicates organisation. This also applies to the students living in the hosting city. If possible, they should stay in the same accommodation as the foreign students to foster the communal spirit.

From the financial point of view, participating students should be informed beforehand about the additional costs they have to expect during the Summer School. A rough overview on the everyday prices in the respective country can be helpful, too.

We also suggest including the International Offices of the respective Universities as well as the financial departments into the organisation of the Summer Schools. This will make management a lot easier and also enhances the flow of information.



Fig. 1: Examples of social events that can be offered during a Summer School

Organisation of Lectures

One point that was already mentioned in the introduction is the overall very high workload of a Summer School. In our case 14 days of intensive teaching and practical work with only one free day demands a lot of the students and the teachers. One simple thing that should always be remembered is to make a break after every hour of lecture. This gives participants the opportunity to regain some energy needed for concentrating on the lectures.

The lectures within the Summer School “Soil and Water” cover a wide range of different topics, from “Wetland Ecology” to “Microbial Processes in Soil” to “Soil Zoology”, just to name a few. All topics are taught by different professors and lecturers. When planning a Summer School, the arrangement of these topics should be carefully considered, with more general topics in the beginning and those going more in-depth in the end. As many of the lectures cover the overall topic of soil ecology, it should be planned beforehand, which lecture contains talks about the fundamentals. If this is not arranged in the beginning, many talks will start with the same introductory information and the students will lose interest right from the start. In the case of our Summer School as well as in many others, the students do have a different background in terms of their level of knowledge and their study history. Hence, the teachers should consider this while preparing for their presentation.

Our Summer School consists of lectures, practical work and excursions. To achieve a better understanding and also a high rate of memory it is necessary to create cross-links between these three elements (see also Fig. 2). In practice, this could be implemented by e.g. having a lecture, practical work and an excursion on the same topic. Thereby, students can experience contents learned during the lectures on site during the excursions. It is important that also during these excursions, teachers should refer to what was already included in their lectures (see also Table 4 for an exemplary schedule).

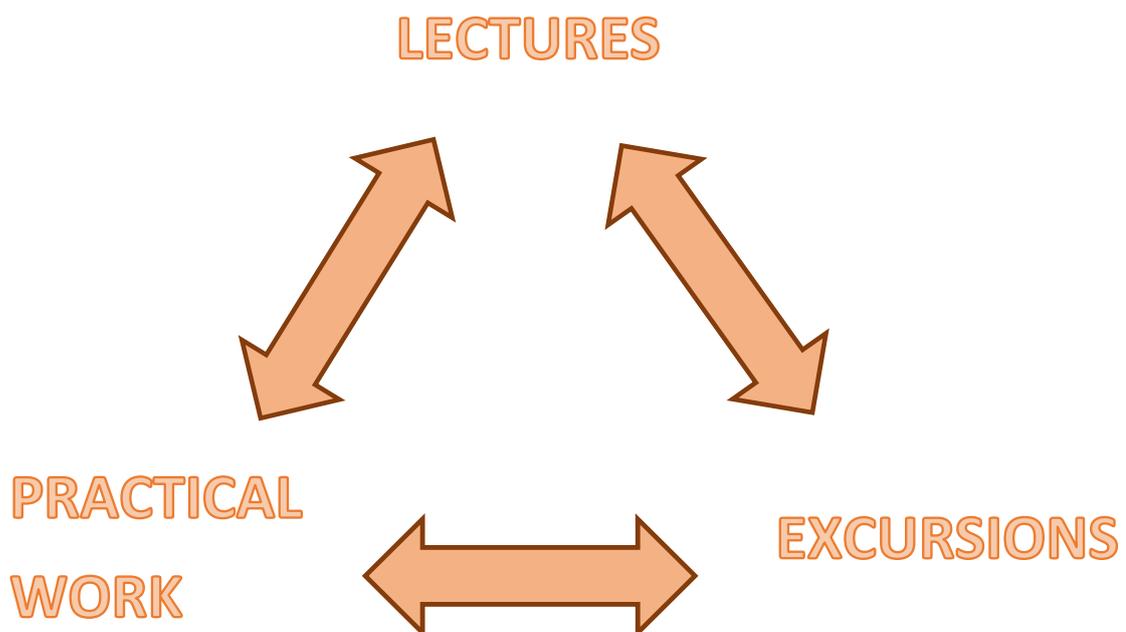


Fig. 2: Cross-links between the major constituents of the Summer School

After the first years of performing the Summer School, it became visible that understanding scientific English is hard even for those students with a good background of speaking this language. We reacted towards this deficit by creating a glossary especially for students of soil and plant ecology. It contains terms related to these topics that might arise during lectures. Students receive this glossary in advance to the Summer School to give them the chance to practice these terms or bring this glossary to the lecture. It contains translations in all four languages of the partner countries (Table 1).

Table 1 Exemplary excerpt of the "Soil and Water" glossary for terms used in soil and plant ecology.

English	Czech	Estonian	French	German
fen	slatiniště	(madal)soo	marais	Niedermoor
fescue	Festuca sp. (druh trav)	aruhein	fétuque	Schwingel
field capacity	polní (vodní) kapacita	väliveemahutavus	capacité au champ	Feldkapazität
highway runoff	vyvolaná obrana	reovesi kiirteedelt	Eaux de ruissellement des routes	Oberflächenabfluss von Straßen

To further improve the quality of the lectures, we created a portfolio dealing with main didactical aspects. This portfolio is freely available on the “EduSaPMan” – Homepage: <https://www.uni-ulm.de/nawi/nawi-edusapman/work-packages/work-package-3/portfolio/>

Organisation and Implementation of Mini Research - Projects

For many participants, the Summer School gives the first opportunity to perform a “real scientific experiment” from the beginning until the end. We tried to set up small scale projects that are realisable in less than two weeks of time, but still give an insight into scientific work and different methods related to soil ecology.

After choosing a topic, the students are grouped and provided with scientific papers related to their field. They have to read and understand these research papers and present them to the other participants. Doing so also improves their confidence in using the English language and presenting data. The work groups consist usually of 4-5 people.

Examples for our Mini-Research Projects are:

- Plant-soil relationships: leaf litter decomposition
- Soil physico-chemical properties
- Temperature sensitivity of soil respiration

The experiments are usually performed in the first days of the Summer School. The last days should be used for data processing, understanding and preparing a presentation about the results. In this way, the participants will get insights in all steps necessary for scientific work.

To additionally enhance the interaction between the different nationalities, we recommend creating “forced mixed groups” with preferably at least one student from each partner country. This fosters not only the contacts and relationships between the countries but also prevents the students from speaking their native language within the working groups. In summary, it can be stated that this practical work gives insights into new practical methods as well as it improves language skills and soft-skills like working in a team.

Didactical feedback

To improve the experience of the Summer School as well as the teaching abilities, it is important to include some feedback tools, like evaluation forms. These evaluation forms should be adjusted to the Summer School. This evaluation will reflect students’ opinions and highlight aspects that should be reconsidered (see also chapter: “Evaluation”).

Besides this internal evaluation, we recommend to include external quality assurance. In our case, the quality of teaching was monitored using video recordings evaluated by the Centre of Didactics of Ulm University. Detailed reports help to improve teaching in the context of appearance, teaching methods and the creation of a presentation.

Evaluation

The subject of soil ecology is seldom the most popular one among students. Before the implementation of the “Soil and Water” Summer School, soil ecology was taught as a regular module at Ulm University. Within this module, practical work was done only in and around Ulm University and lectures were held by two to three different teachers.

This module was replaced by the “Soil and Water” Summer School in 2012, held in a different country every year (France, Germany, Czech Republic, Estonia). It aimed to enhance the aspect of internationalisation on the one hand and to make the topic of soil ecology more appealing to students on the other. This Summer School was regularly evaluated and students’ suggestions as well as the suggestions for improvements of the Centre of Didactics of Ulm University were included in the organisation of the subsequent Summer Schools.

We created an evaluation form especially aimed for this kind of course, so the students’ feedback will fit better to the Summer School (See Annex 2). It can be used for other Summer Schools as well.

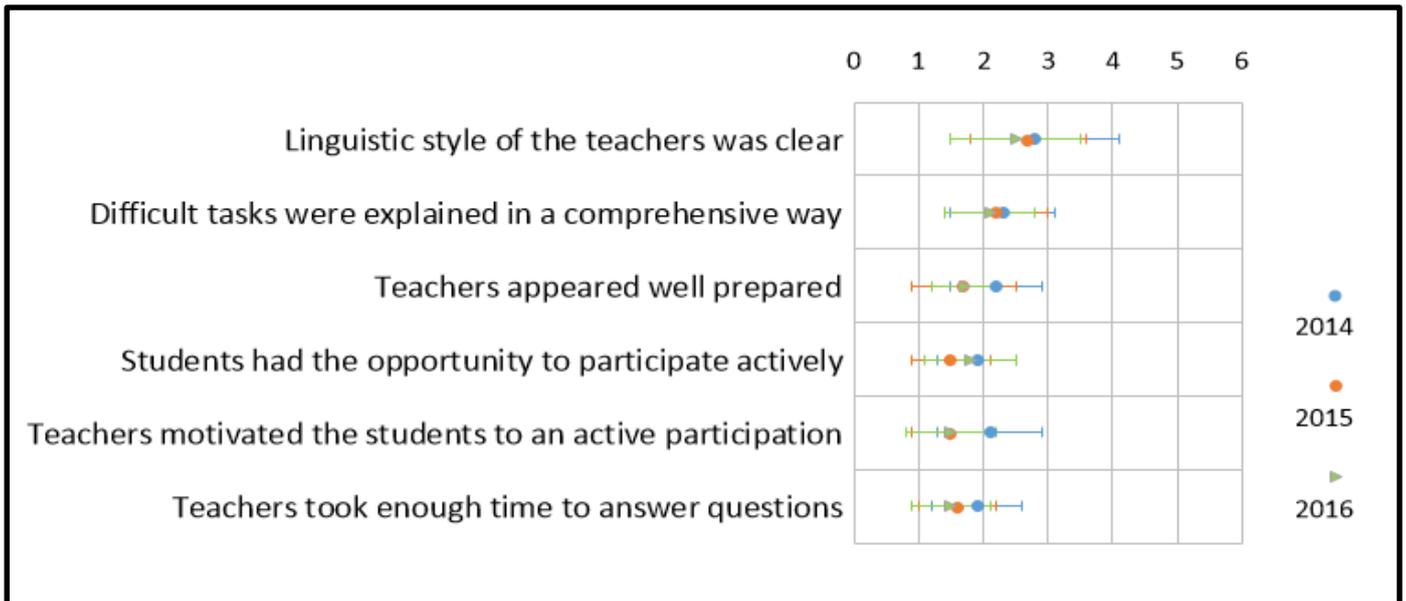
Over the years, almost all evaluated points improved (Table 2). Regarding the teaching methods, especially the points “Teachers motivated the students to an active participation” and “Teachers took enough time to answer questions” were rated better in the years 2015 and 2016 than in 2014. We take this as a sign of the successful guidance of the Centre of Didactics, which included valuable hints on good lectures in their evaluations (Table 2a).

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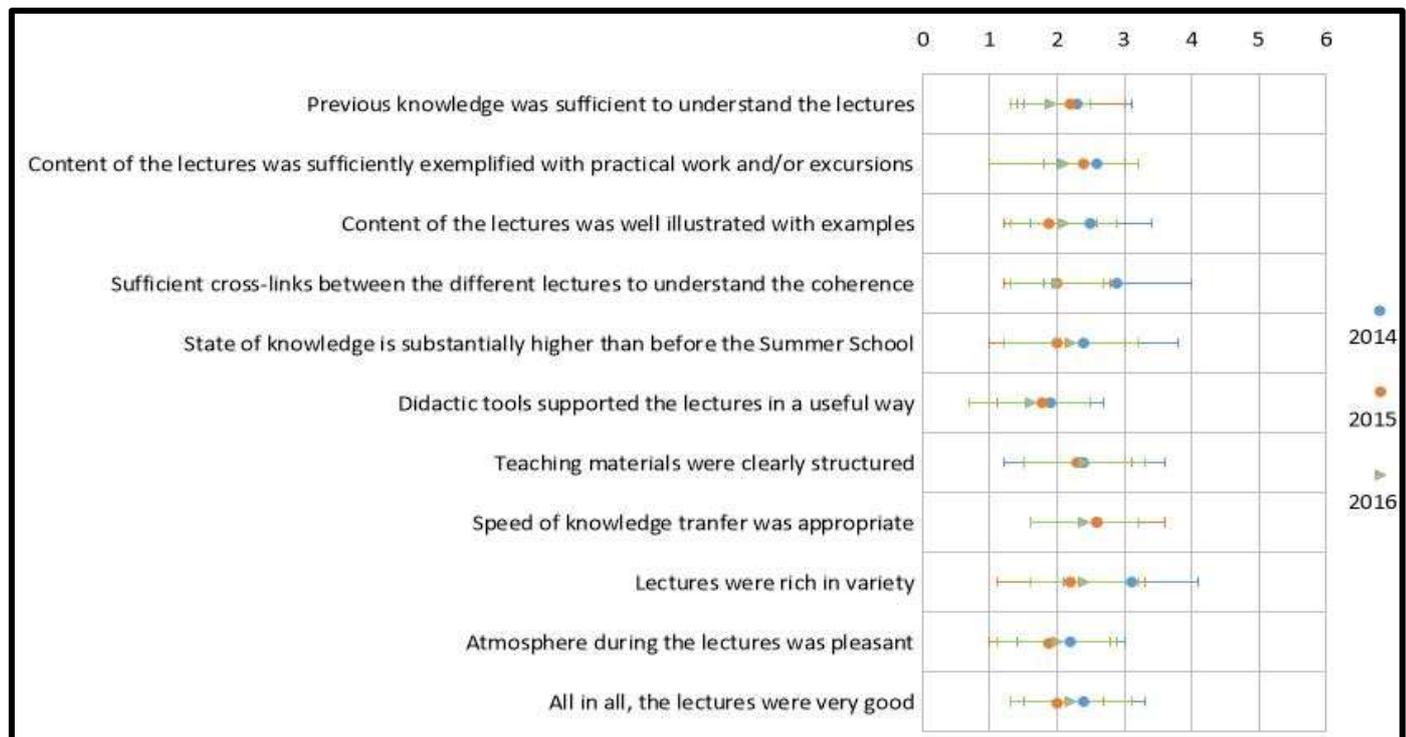
The evaluation of the lectures shows no big changes, but they were already rated very positive in the first year of evaluation (ranged between 1.5 to 2.5). What should be emphasized here are the points “Sufficient cross-links between the different lectures to understand the coherence” and “Lectures were rich in variety”, which improved considerably after the first year of evaluation (Table 2b).

Table 2 Results of the student evaluation of the years 2014 – 2016, Numbers according to school grades (1 = very good, 6 = very bad), Evaluation of teachers (a) and lectures (b). Values lower than zero only occur due to the standard deviation.

(a)

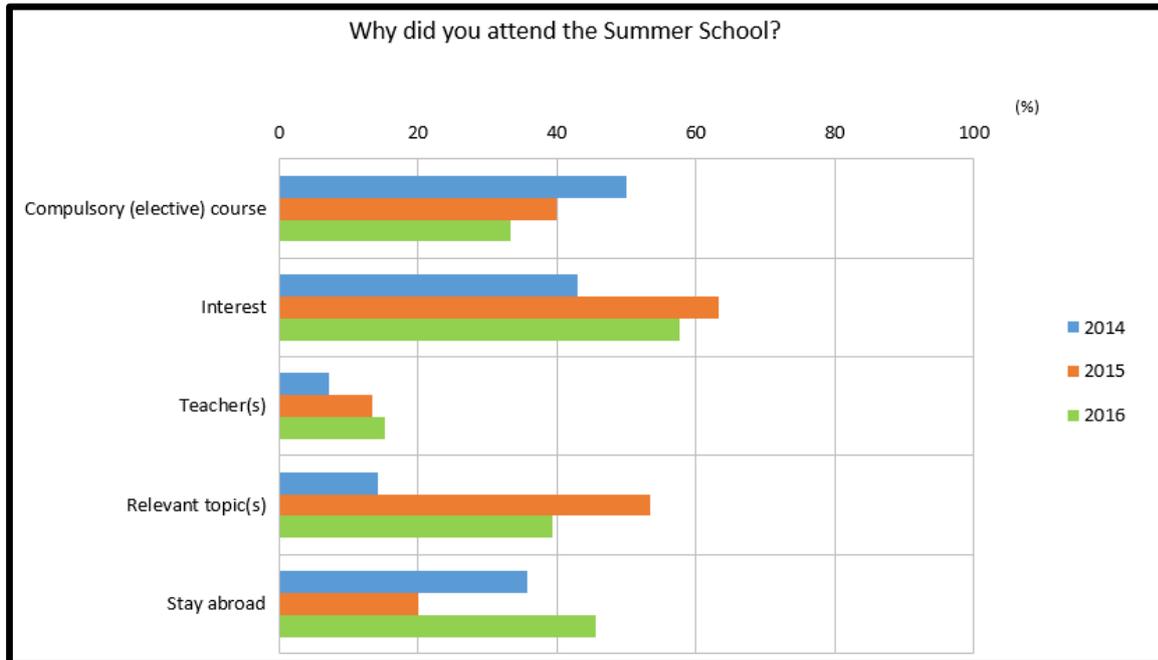


(b)



Within this evaluation, we also tried to assess the reasons why students attend the Summer School “Soil and Water”. This was meant to evaluate if our dissemination strategies (webpage, flyers, posters) proved to be successful. A rising interest and the opportunity to learn about relevant topics increased after the first year of evaluation. Less students attended the course for compulsory reasons (Table 3). Good dissemination strategies turn out to result in a better awareness and rising interest in this Summer School as well as the topic of soil and plant ecology.

Table 3 Reasons for attending the Summer School; Results from the student evaluation.



Conclusion

the years, we conclude that our efforts in the organization as well as the improvements based on the evaluation’s suggestions are effective ways to improve the overall experience of a Summer School.

Aiming at a well-organized structure of learning contents, cross-linked practical work and excursions and a good learning atmosphere are the main points that should be considered during a Summer School. Most of our suggestions are not only valuable in the field of soil and plant ecology, but also applicable to other topics, especially in all fields of life sciences. Also other sciences that include practical work and/or excursions might benefit from our experiences.

A Summer School like this might be especially useful in fields that are not the most “popular” research fields, to raise interest and awareness.

References

Cooper H, Charlton K, Valentine JC, Muhlenbruck L, Borman GD (2000) Making the Most of Summer School: A Meta-Analytic and Narrative Review. *Monographs of the Society for Research in Child Development*, Vol. 65, No. 1

Smith GA (2000): Place-Based Education: Learning to Be Where We are, *Phi Delta Kappan* Vol 83, Issue 8, pp. 584 – 594. Doi:10.1177/003172170208300806

"EduSaPMan" 2017: How to manage a successful Summer School

Table 4 Exemplary Schedule of a "Soil and Water" Summer School. Lectures are marked blue, practical work orange and excursions green

Sun 06.09	Mon 07.09.	Tue 08.09.	Wed 09.09.	Thur 10.09.	Fri 11.09.	Sat 12.09.	Sun 13.09.	Mon 14.09.	Tue 15.09.	Wed 16.09.	Thur 17.09.	Fri 18.09.
08:00	Introduction	Wetland Ecology	Role of the secondary plant metabolites on ecosystem functioning	Constructed wetlands	Introduction in soil zoology	Bus transfer to Ulm via Blaubeuren	Bus transfer to Ulm University	Soil degradation	Experimental climate change	Soil exploitation & root architecture	Synthesis	ERASMUS Mobility & Outlook
08:30												
09:30	Soil Water Relations	Biopools	Protection & sustainable use of soils	Wetland restoration	Effect of stress and disturbance on soil organic matter recycling	Introduction to the practical work at the Botanical Garden, Ulm University	Plant stress	Role of stomata in sensing environment	Introduction to soils of the Swabian Albs	Microbial processes in soils (soil ecology)	Why should one go to ...?	Why should one go to ...?
10:30	Introduction to Southern German wetlands											
11:30												
12:30	Arrival	Lunch					Free day	Lunch at Ulm University	Lunch			
14:00	Excursion: Lake Constance	How to write reports and give presentations	Excursion: Lake Federsee	Excursion: Pfrunger Ried	self-study	Lunch at "Biergarten am Botanicum"	Practice in soil ecology and plant ecophysiology at Ulm University (in small groups)	Data evaluation of practical work	Excursion: dry grasslands	Preparation of presentations	Presentation of results	Visit of the prehistoric museum; Excursion: forests on valey slopes
15:00		group formation & allocation of topics			Excursion: Lake Federsee	Excursion: Pfrunger Ried				Presentation of topics (10 min each group)		Sightseeing in Ulm
16:00		self-study				Transfer to Blaubeuren by train					Feedback session	
17:00												Farewell party with Barbecue
18:00												
19:00												

Annex 2: Evaluation Form: Summer School “Soil and Water”

Why did you attend the Summer School? (multiple responses allowed)

<input type="checkbox"/> Compulsory (elective) course	<input type="checkbox"/> Interest	<input type="checkbox"/> Teacher(s)	<input type="checkbox"/> Relevant topic(s)	<input type="checkbox"/> Stay abroad	<input type="checkbox"/> Other (please specify): _____
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Where did you hear about the Summer School? (multiple responses allowed)

<input type="checkbox"/> Home university	<input type="checkbox"/> Other students	<input type="checkbox"/> Internet (project web page)	<input type="checkbox"/> Host university	<input type="checkbox"/> Former participants	<input type="checkbox"/> Other (please specify): _____
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To what extent do you agree with the following statements?

Strongly agree Agree Rather agree Rather disagree Disagree Strongly disagree Cannot be assessed

Organization of the Summer School							
The duration of the Summer School was appropriate.	<input type="checkbox"/>						
The dates of the Summer School fit well in my study plan.	<input type="checkbox"/>						
The workload during the Summer School was appropriate.	<input type="checkbox"/>						
The number of lecture hours was appropriate.	<input type="checkbox"/>						
The Summer School was well organized.	<input type="checkbox"/>						
The time management of the courses was appropriate.	<input type="checkbox"/>						
Additional Remarks							
Content and quality of the lectures							
My previous knowledge was sufficient to understand the lectures.	<input type="checkbox"/>						
The content of the lectures was sufficiently exemplified with practical work and / or excursions.	<input type="checkbox"/>						
The content of the lectures was well illustrated with examples.	<input type="checkbox"/>						
There were sufficient cross-links between the different lectures to understand the coherence.	<input type="checkbox"/>						
My state of knowledge is substantially higher than before the Summer School.	<input type="checkbox"/>						
The didactic tools (projector, blackboard, etc.) supported the lectures in a useful way.	<input type="checkbox"/>						

“EduSaPMan” 2017: How to manage a successful Summer School

		Strongly agree	Agree	Rather agree	Rather disagree	Disagree	Strongly disagree	Cannot be assessed
The teaching materials (slides, etc.) were clearly structured.		0	0	0	0	0	0	0
The speed of knowledge transfer was appropriate.		0	0	0	0	0	0	0
The lectures were rich in variety.		0	0	0	0	0	0	0
The atmosphere during the lectures was pleasant.		0	0	0	0	0	0	0
All in all, the lectures were very good.		0	0	0	0	0	0	0
Additional Remarks								
Teachers								
The linguistic style of the teachers was fluent and clear.		0	0	0	0	0	0	0
Difficult facts were explained in a comprehensive way.		0	0	0	0	0	0	0
The teachers appeared well prepared		0	0	0	0	0	0	0
The students had the opportunity to participate actively.		0	0	0	0	0	0	0
The teachers motivated the students to an active participation (e.g. by asking questions).		0	0	0	0	0	0	0
The teachers took enough time to answer questions.		0	0	0	0	0	0	0
Additional Remarks								
Practical work / excursions / student contribution by students								
The size of the working groups was appropriate.		0	0	0	0	0	0	0
The supervision by the teachers was appropriate.		0	0	0	0	0	0	0
The atmosphere during the practical work and the excursions was pleasant.		0	0	0	0	0	0	0
The number of excursions was appropriate.		0	0	0	0	0	0	0
The number of practical work hours was appropriate.		0	0	0	0	0	0	0
The level of the courses was appropriate.		0	0	0	0	0	0	0
The contributions by students were useful.		0	0	0	0	0	0	0
Additional Remarks								

“EduSaPMan” 2017: How to manage a successful Summer School

What did you particularly like?

What could be improved?