INTERNATIONAL SUMMER SCHOOLS: AN EFFECTIVE WAY OF LEARNING

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Abstract

This contribution presents the development and results of an International Summer School organized by CEIMAR Campus and the University of Granada (Spain). The school was intended for graduate students interested in physical processes in nearshore and estuarine systems. The “III CEIMAR International Summer School on Estuarine and Nearshore Systems: From Fundamentals to Cutting-Edge Knowledge” consisted of 70 hours in a two-week period, and aimed at providing an integral view of actual coastal systems through topic lectures and hands-on practices (50%-50% of hours) led by international renowned experts. The students’ activities included short individual self-presenting presentations; teamwork to carry out practices and a short research project, and final group presentations of the project outcome. The results of an anonymous survey submitted to the participants after the completion of the school indicated that the experience was highly positive, in personal as well as in professional terms. The participants’ evaluation showed that the development of this type of activities is positive not only for learning and specialization but also to enhance transversal abilities, such as networking.

Keywords: summer school, physics, engineering, research projects.

1 INTRODUCTION

Summer schools are intensive academic meetings, whose objective is to share knowledge on an specific topic among experts and qualified students, and plays an important role for training future, highly specialized professionals. This type of learning allows students with different background and from different countries to work together under supervision of experts. Thus, they can share their knowledge, abilities, and attitudes during the resolution of prescribed short projects. This paper presents the development and results of an International Summer School organized by the ‘Escuela Internacional de Doctorado en Estudios del Mar’ EDEIMAR (Campus de Excelencia Internacional del Mar, CEIMAR, Spain) and the University of Granada (Spain), advised by the Utrecht University (The Netherlands). The International Summer School was held from 06/05/2016 to 06/17/2016 in the Andalusian Institute for Earth System Research (known as IISTA after its Spanish initials) Granada, Spain.

2 METHODOLOGY

The “III CEIMAR International Summer School on Estuarine and Nearshore Systems: From Fundamentals to Cutting-Edge Knowledge” focused on the process-based modelling of estuarine and nearshore systems, covering from fundamental concepts to advanced applications or current knowledge of these systems. The primary topic of the school was the study of the estuarine and the nearshore environment with simple mathematical-physical models that govern hydrodynamic, morphodynamic, and ecological processes. The school aimed at providing an integral view of actual coastal systems through thematic lectures, and hands-on practices led by international renowned experts. Practices consisted of computer, laboratory, and field activities (Fig.1). This methodology has been applied over the last decade in both bachelor and master programs in the field of maritime and coastal engineering with a high degree of success [1].

The school was intended for MSc and PhD students interested in physical, engineering, and ecological processes in coastal systems. The students were thus expected to be familiar with basic
concepts of hydrodynamic equations, ocean waves, boundary layer properties, mathematical and statistical methods, and computer programming.

The course consisted of 70 hours a two-week period aimed at providing an integral view of actual coastal systems. The course took the form of 32 hours of lectures and assisted practices, approximately 10 hours of a field trip (Fig.1), and about 28 hours of students' work. Approximate distribution of hours between thematic lectures and practices was about 50%. Hands-on practices with state-of-the-art models [2] were done by the students and assisted by international renowned experts. The course included laboratory experiments in the IISTA facilities, and a field trip to the Mediterranean coast of southern Spain to introduce the students into the oceanographic instrumentation and data analysis techniques [3]. Lectures and practices were organized in four parts, 8 hours each: (I) beach and nearshore, (II) estuaries, (III) nearshore and estuarine biochemistry, and (IV) smart data analysis.

The student's working hours included short individual presentations (10 min/student) in which they introduced themselves and their research interests; teamwork to carry out practices and assigned projects; and final group presentations of the outcome of the project (30 min/group). The assigned projects consisted of a short research on different topics addressed at the school. Each project was expected to be carried out by a group of 3 or 4 students under supervision of the experts. These projects were assigned by organizers and lecturers. At the end of the Summer School, each group gave a 30 min presentation of the outcome of the project.

Figure 1. Training activities in the Granadian coast (southern Spain): hands-on practices led by international renowned experts.

3 RESULTS AND CONCLUSIONS

The Summer School contents and organization was evaluated by participants through an anonymous and simple survey. Each item was evaluated from 1 to 5, being 5 the highest mark. The specific questions were regarding the: information provided to the participants (Q1 in Fig.2); attention dispensed to requests, queries and suggestions (Q2); schedule and day-by-day organization of lectures and practices (Q3); housing and accommodation services (Q4); facilities at the IISTA to do the summer school activities (Q5); selection of lectures' topics (Q6); balance between theory and practices hours (Q7); field trip organization and information provided before and during the training activities in the field (Q8); connection between field trip activities and the aim of the summer school (Q9); topic selection of the short research projects (Q10); extension and duration of the short projects, and effort required to their completion (Q11); precision of the objectives to attain during the short projects (Q12); overall summer school organization (Q13); and the potential impact of the summer school in the participants' professional careers (Q14).

As is shown in the pie charts in Fig.2, the survey results were quite favourable with every answer evaluated in upper 4s out of 5. The participants' evaluation showed that the development of this type of activities is positive for both learning and specialization.
<table>
<thead>
<tr>
<th>Q1</th>
<th>The information provided was complete and useful</th>
<th>Q11</th>
<th>The organization of the short projects was adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2</td>
<td>The quizzes were attended properly</td>
<td>Q12</td>
<td>The short projects tasks were clear</td>
</tr>
<tr>
<td>Q3</td>
<td>The schedule was adequate</td>
<td>Q13</td>
<td>Rate the summer school</td>
</tr>
<tr>
<td>Q4</td>
<td>The housing was adequate</td>
<td>Q14</td>
<td>Rate the potential impact in your professional career</td>
</tr>
<tr>
<td>Q5</td>
<td>The university facilities were adequate</td>
<td>Q15</td>
<td></td>
</tr>
<tr>
<td>Q6</td>
<td>The selection of topics &amp; lectures was adequate</td>
<td>Q16</td>
<td></td>
</tr>
<tr>
<td>Q7</td>
<td>The balance theory/practice was adequate</td>
<td>Q17</td>
<td></td>
</tr>
<tr>
<td>Q8</td>
<td>The information on the field trips was useful</td>
<td>Q18</td>
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</tr>
<tr>
<td>Q9</td>
<td>The field trip activities were appropriate</td>
<td>Q19</td>
<td></td>
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<tr>
<td>Q10</td>
<td>The short project topics were adequate</td>
<td>Q20</td>
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</tbody>
</table>

**Figure 2. Results of the anonymous survey.**

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