Work Package 4 | Deliverable 2

D4.2 Interim Web-based IBSE materials for Teacher Education

Dissemination Level: Public
Thematic Priority: Science in Society
Funding Scheme: Coordination and Support Actions

Deliverable No.: D4.2
Due date of deliverable: August 2011
Actual submission date: 12/03/2012

Start date of project: 01/01/2010
Name of Coordinator: Dr. Eilish McLoughlin
Name of lead partner for this deliverable: UmU

Duration: 48 months
A. Background to this report

This report is a deliverable of Work Package 4 (WP4) of the European FP7-funded project “European Science and Technology in Action: Building Links with Industry, Schools and Home” (ESTABLISH; 244749, 2010-2013). It meets the requirements of Deliverable 4.2 by presenting a report on the web-based IBSE materials selected and adapted by the beneficiaries of ESTABLISH. (See Table 1 below for beneficiary list). As the materials are equally applicable to both in-service and pre-service teacher education, it was agreed at the general assembly meeting held in in Umeå. (GA4) that this Deliverable 4.2 would also meet the original requirement of Deliverable 5.2, and that the focus of D5.2 be reassigned. The development of the materials presented here have been led by Margareta Ekborg (MaH), Maria Sandström (MaH), Annika Kjellsson Lind (UmU), Helena Nas (UmU) and Christina Ottander (UmU)

This document, published in March 2012, has been produced within the scope of the ESTABLISH Project. The utilisation and release of this document is subject to the conditions of the contract within the Seven\textsuperscript{th} Framework Programme, project reference FP7-SIS-2009-1-244749.

For further information regarding ESTABLISH please contact:
Dr. Sarah Brady (ESTABLISH project manager)
Email: sarah.brady@dcu.ie
ESTABLISH website: http://www.establish-fp7.eu
### B. The ESTABLISH consortium

<table>
<thead>
<tr>
<th>Beneficiary short name</th>
<th>Beneficiary name</th>
<th>Country</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCU</td>
<td>DUBLIN CITY UNIVERSITY</td>
<td>Ireland</td>
<td>IE</td>
</tr>
<tr>
<td>AGES</td>
<td>AG EDUCATION SERVICES</td>
<td>Ireland</td>
<td>IE</td>
</tr>
<tr>
<td>UCY</td>
<td>UNIVERSITY OF CYPRUS</td>
<td>Cyprus</td>
<td>CY</td>
</tr>
<tr>
<td>UmU</td>
<td>UMEA UNIVERSITET</td>
<td>Sweden</td>
<td>SE</td>
</tr>
<tr>
<td>JU</td>
<td>UNIWERSYTET JAGIELLONSKI</td>
<td>Poland</td>
<td>PL</td>
</tr>
<tr>
<td>CUNI</td>
<td>UNIVERZITA KARLOVA V PRAZE</td>
<td>Czech Republic</td>
<td>CZ</td>
</tr>
<tr>
<td>AL</td>
<td>ACROSSLIMITS LIMITED</td>
<td>Malta</td>
<td>MT</td>
</tr>
<tr>
<td>UPJS</td>
<td>UNIVERZITA PAVLA JOZEFA ŠAFÁRIKA V KOŠICIACH</td>
<td>Slovakia</td>
<td>SK</td>
</tr>
<tr>
<td>COUO</td>
<td>CARL VON OSSIEZKY UNIVERSITAET OLDENBURG</td>
<td>Germany</td>
<td>DE</td>
</tr>
<tr>
<td>UTARTU</td>
<td>TARTU ULIKOOK</td>
<td>Estonia</td>
<td>EE</td>
</tr>
<tr>
<td>UNIPA</td>
<td>UNIVERSITA DEGLI STUDI DI PALERMO</td>
<td>Italy</td>
<td>IT</td>
</tr>
<tr>
<td>MaH</td>
<td>MALMÖ UNIVERSITY</td>
<td>Sweden</td>
<td>SE</td>
</tr>
<tr>
<td>IPN</td>
<td>LEIBNIZ-INSTITUT FUER DIE PAEDAGOGIK DER NATURWISSENSCHAFTEN UND MATHEMATIK AN DER UNIVERSITAT KIEL</td>
<td>Germany</td>
<td>DE</td>
</tr>
<tr>
<td>CMA</td>
<td>CENTRE FOR MICROCOMPUTER APPLICATIONS</td>
<td>Netherlands</td>
<td>NL</td>
</tr>
<tr>
<td>MLU</td>
<td>MARTIN LUTHER UNIVERSITAET HALLE-WITTENBERG</td>
<td>Germany</td>
<td>DE</td>
</tr>
</tbody>
</table>
Introduction

This report describes how to access the web-based materials selected and adapted by the beneficiaries of ESTABLISH to support the provision of teacher education in Inquiry Based Science Education (IBSE).

1. Accessing ESTABLISH Teacher Education resources

The materials and resources for teacher education adapted by the beneficiaries of ESTABLISH have been posted to the members area of the project website: www.establish-fp7.eu, in the category for TEACHER EDUCATION (WP4/5)

In order to access this area of the website, an account for the Project Officer has been setup with the username “project.officer”.

A password will be forwarded on request from info@establish-fp7.eu

2. ESTABLISH Teacher Education

The provision of teacher education in IBSE is central to the ESTABLISH project. In terms of defining IBSE and scientific inquiry the ESTABLISH definition is based on the definition of inquiry (Marcia C. Linn, Elizabeth A. Davis, & Philip Bell, 2004)

“Inquiry is the intentional process of diagnosing problems, critiquing experiments, and distinguishing alternatives, planning investigations, researching conjectures, searching for information, constructing models, debating with peers, and forming coherent arguments.”

The ESTABLISH Teaching and Learning units (WP3) are the central component of all teacher education programmes. The framework, outlined in D5.2, for ESTABLISH teacher education is focused on core elements supported by additional materials and resources to address aspects of implementing of IBSE within the classroom (Fig.1).

Figure 1: Framework for ESTABLISH Teacher Education

The core elements are:

I. ESTABLISH view of IBSE
II. Industrial Content Knowledge (ICK)
III. Science Teacher as Implementer
IV. Science Teacher as Developer

WP4 Deliverable 4.2
While the supporting elements are:

V. Classroom Management  
VI. ICT  
VII. Argumentation in the classroom  
VIII. Questioning Skills for Inquiry  
IX. Research and design projects for students  
X. Assessment of IBSE  
XI. Critiquing activities for IBSE  
XII. Evaluating evidence

An outline of four workshops addressing the core elements for ESTABLISH teacher professional development programmes are presented online:

1. Introduction to IBSE – what it is, and why IBSE (ESTABLISH view of IBSE)  
2. To work with ESTABLISH units (Science Teacher as Implementer)  
3. Ideas of how to work with Industrial Links (Industrial Content Knowledge (ICK))  
4. Teachers’ reporting and reflecting about classroom work (Science Teacher as Developer)

The resources available on this website are to facilitate the provision of ESTABLISH teacher education programmes, with details of the workshops, followed by a number of activities to support the implementation of IBSE within the classroom. A forum is also available for consortium members to post their comments, feedback and suggestions.