

## PROFILES CPD PROGRAMME

In planning the introduction of PROFILES to Ireland, it was recognised that the key to successful implementation of PROFILES lay in the provision of CPD courses of the highest calibre. The CPD programme was divided into two phases: September 2011 – December 2011 (Phase 1) and January 2012 to June 2012 (Phase 2). The CPD courses consisted of lectures, workshops and laboratory sessions.

Phase 1 of the CPD focussed on introducing the PROFILES project and laying the foundation for the development of the modules. In phase 2 particular emphases was placed on “fine tuning” the modules, monitoring their implementation and providing support to teachers. Some of the topics covered are summarised in the right hand column.

### Examples of topics covered in lectures.

- Introduction to PROFILES
- PARSEL type modules – their purpose.
- What is Inquiry Based Science Education?
- The constructivist teaching approach.
- Scientific Literacy, STS movement, PISA Study.
- Assessment in Science Education.
- Teaching of science by specialists at Junior Certificate.
- Multiple Intelligences Theory- What every teacher should know.
- Teaching difficult ideas in Science Education.
- The Reflective Practitioner.
- Research methods in Science Education – Action Research.
- Inquiry Based Science Education – What the Literature says.



## WELCOME ... FÁILTE

We extend greetings to all our PROFILES friends, colleagues and partners. We are delighted to produce this latest Newsletter and we hope it will bring you up to date with all the events of PROFILES in Ireland. Since our last Newsletter in February 2012 we have been working hard with PROFILES as we have 30 schools involved in the project in Ireland. This has kept us busy providing Continuing Professional Development (CPD) programmes for teachers, developing PROFILES modules, trialling these modules in schools as well as collecting and analysing data for the Delphi Study and MoLE Study. We are glad to report that we have achieved all the objectives that we set out for ourselves at the beginning of the year and we look forward to continued success working with PROFILES in the coming school year.



Pictured at the PROFILES stand at the ISTA Annual Conference (see below) in Trinity College Dublin in April 2012 were Dr Declan Kennedy, Mario Hoffmann, Noel Brett and Vincent Schneider. Mario and Vincent were guests from the Freie Universität Berlin.



Group of PROFILES teachers attending a day seminar in UCC on Saturday 3 March 2012

### Examples of topics covered in PROFILES Workshops

- Student motivation and Students Attitude to Science
- Promoting Scientific and Technological Literacy (STL). The nature of Science Education.
- Identifying the CPD needs of teachers.
- Discussion of modules to be used.
- Writing and designing PROFILES intervention modules.
- Peer group presentations on draft intervention modules.
- Planning of implementation in January 2012
- SWOT Analysis (Strengths, Weaknesses, Opportunities and Threats).
- What worked well? What modifications were needed?
- Promoting Teacher Ownership.
- Role of teacher in dissemination and networking.
- Discussion of common concerns.
- Student feedback to date.



Teachers involved with PROFILES at an upskilling session in the chemistry laboratory in the UCC Eureka Centre

### PROFILES AND THE EUREKA CENTRE UCC

All of the CPD courses for PROFILES take place in the Eureka Centre for Inquiry Based Education in Science and Mathematics in UCC. The CPD programme for PROFILES is delivered by the PROFILES Ireland team of Noel Brett, John Lucey and Dr Declan Kennedy. The Eureka centre consists of two state-of-the-art science laboratories, a Science Education Resource Centre and a conference room that is fully equipped with all the latest video-conferencing technology.

### PROFILES DISSEMINATION IN IRELAND

The Annual Conference of the Irish Science Teachers' Association (ISTA) was held in Trinity College Dublin from 20 -22 April 2012. Over 500 teachers attended the conference and PROFILES was represented by Noel Brett, John Lucey and Dr Declan Kennedy. A PROFILES stand was on display in the Exhibition area and samples of PROFILES modules developed by the UCC/ICASE team and PROFILES information brochures were distributed to the many teachers who visited the stand. In addition, Noel Brett presented a PROFILES workshop on the use of datalogging in promoting Inquiry Based Science Education.

The Eureka laboratories are fully equipped to teach physics, chemistry and biology to Leaving Certificate standard. The Leaving Certificate is the state examination taken by students aged 18 in Ireland. Due to its outstanding laboratory facilities, the Eureka Centre is the ideal location for providing CPD courses to teachers involved in the PROFILES project. In addition, the Science Resource Centre is fully equipped with all the back-up resources required by teachers to teach science in an effective and inspirational manner that is grounded in IBSE.



**“One generation plants the trees and another gets the shade.”** Chinese Proverb



### **PROFILES AND ICASE COLLABORATION**

University College Cork and the International Council of Associations for Science Education (ICASE) have closely collaborated on PROFILES since the project was first initiated. This is a natural collaboration since Dr Jack Holbrook, former President of ICASE, and Dr Declan Kennedy, European Representative for ICASE, are both actively involved in PROFILES. The collaboration has worked extremely well as the Irish Science Teachers' Association is a member of ICASE and this has enabled the UCC team to work with teachers throughout the ISTA network. In addition, the collaboration with ICASE has helped us to draw on the expertise of ICASE in the area of the provision of CPD courses for teachers and to use the ICASE international network for the dissemination of PROFILES materials.

ICASE, in official partnership with UNESCO and the Global Research and Intelligence Network (GRAIN), are hosting the 4<sup>th</sup> World Conference on Science and Technology Education in 2013 (WorldSTE2013). The conference will be held on Borneo Island in the city of Kuching, Malaysia.

**The CPD programme** for PROFILES was run at evenings and on Saturdays in UCC starting in September 2011 and finishing in June 2012. The picture on the right hints at the level of preparation essential for a typical CPD laboratory workshop.

**It has been a busy year for the UCC / ICASE group working with PROFILES and we look forward to continued success and collaboration with all our PROFILES partners in the coming school year.**

Above:

**At a special function in Cork to mark the UCC/ICASE collaboration, Dr. Jack Holbrook makes a presentation to teachers involved in PROFILES work.**

Below:

**On the occasion of his visit to the Eureka Centre UCC, Dr. Jack Holbrook is presented with a Cork Crystal souvenir by Dr. Declan Kennedy (on right) and Prof. Patrick Fitzpatrick, Head of the College of Science, Engineering and Food Science, UCC.**



### **Examples of PROFILES modules developed by the UCC / ICASE team.**

#### **1. Does it give you wings?**

This module allows pupils to work as a team in an investigative setting to examine the use of energy drinks in sports and exercise. Pupils investigate the current popularity of both legal and illegal performance-enhancing aids. They then use this information to evaluate energy drinks available and design their own drink based on the information they have gathered.

#### **2. Enzymes are they really needed?**

In this module students research different enzymes and test their functions in different environments. Students also investigate the consequences of an enzyme deficiency to discover whether enzymes are really needed.

#### **3. Getting things moving.**

This module involves pupils investigating the underlying principles of the physical transportation of goods, people and services. In addition, students study the challenges of solving transportation problems in the future with particular reference to how we produce and use energy.

#### **4. Grip it or slip it.**

This module contains a series of activities to allow pupils to join an investigative team which will examine the factors that cause a car tyre to slip on the road.

#### **5. Mouthwash – does alcohol really make a difference?**

This series of tasks allows students to form an investigative team to examine whether mouthwash containing alcohol is more effective at killing bacteria than mouthwash that doesn't contain alcohol.

#### **6. Organ donation – opt in or opt out?**

The aim of this module is to give students an opportunity to investigate issues relating to organ donation and to promote analytical skills, attitudes and values that enable students to play a constructive, participative and responsible role in society.

#### **7. Sweaty Betty – Which is the best deodorant?**

In this module students are given the opportunity to investigate deodorants as part of a research team to develop a homemade version of a deodorant.

#### **8. That makes me sick?**

This series of activities allows students to research the different types of microorganism, devise procedures to examine the microorganisms in their immediate environment, determine the best disinfectant to use and the most effective hand washing technique.

### **DEVELOPMENT OF PROFILES MODULES**

At present, the UCC / ICASE team has developed ten PROFILES modules as described on this page. Initially it was envisaged to develop a smaller number of modules but there was such enthusiasm displayed by teachers attending the first CPD course that the number of modules had to be increased to ten. All modules are aimed at students in the 15 – 16 year age group as this is the age group in which students in Ireland decide on which subjects they will study in the senior cycle of secondary education. Fortunately, the educational system in Ireland contains a year known as a “Transition Year” between junior cycle (age 12 – 15) and senior cycle (age 16 – 18). This “gap year” is an ideal opportunity for teachers to promote “hands on” investigative type activities for students. Hence, the PROFILES modules were developed for Transition year students to help teachers cater for the needs of students in this age group. The modules have proved very popular with the teachers who have become involved in trialling the modules in the classroom over the past year. A brief outline of these modules is given here. All modules may be downloaded from:

<http://chemweb.ucc.ie/Pro2/PROFILES-ucc.htm>

#### **9. Which antacid remedy is the most effective in dealing with excess stomach acid?**

This set of activities allows students to work together as part of a team to design and carry out laboratory activities in order to identify the most effective antacid remedy, to analyse their results and put forward a scientific argument to justify their choice.

#### **10. Body at War**

In this module students are invited to investigate how the body defends itself against disease and how vaccines and antibiotics help the body's immune system. Students are presented with various Case Studies and as a group they will try to find out the disease associated with each case study and propose an appropriate treatment. Using antibiotic discs they also investigate the zone of inhibition on bacterial agar plates.



Laboratory preparation for an investigation on dyes