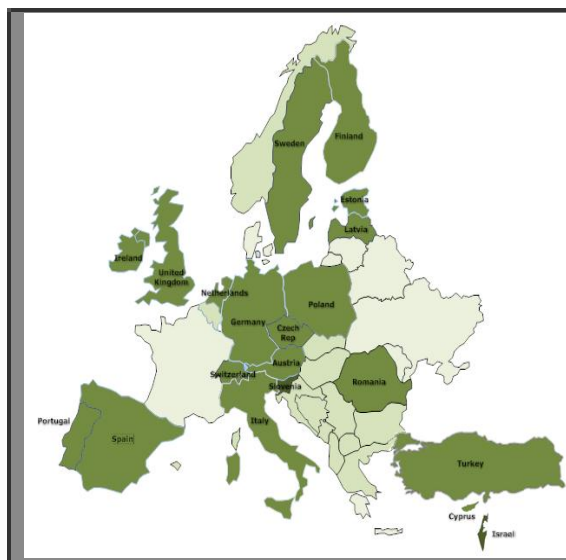




PROFILES
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PROFILES 1st Consortium Meeting – Berlin, 9th to 11th Dec. 2010



Introduction to PROFILES

Jack Holbrook





Welcome to PROFILES

- **PROFILES** is not curriculum development
- although it impacts on the curriculum (we hope)
- **PROFILES** is not research (but it is likely to impact on research).
- **PROFILE S** is COORDINATED ACTIONS.
We work together !!



Content

1. What is innovative in PROFILES?
2. Why the innovation ?
3. So what is PROFILES?
4. What are its targets ?
5. How is PROFILES expecting to achieve targets?
6. What are its indicators of success?
7. Achieving the PROFILE Goals
8. Issues we face
9. Operating PROFILES – the work packages

THE PROFILES Innovation

1. Continuous **Professional Development for Teachers** (first for self efficacy, then teacher ownership).
2. **Development of teachers' networks** (local, regional, national, Europe-wide).
3. **Promoting Inquiry-based approaches in schools (IBSE) – a key element.**
4. **New Pedagogy** affecting the teaching approach.

(See - EC, 2007, Science Education Now)

Why PROFILES ?

- Indicators suggest that students **do not like science**, as taught in European schools.
- Science in school is often portrayed as abstract - it puts forward fundamental ideas, **most developed in the 19th century**, without sufficient *experimental, observational and interpretational background* (EC, *Europe Needs more Scientists, 2004*)
- There is firm evidence that indicates a connection between *attitudes towards science* and the *way science is taught* (EC, *Science Education Now, 2007*).

The Problem

- In most European countries, science teaching methods are essentially *deductive (and guided by positivism)*.
- The presentation of concepts and intellectual frameworks **come first** and are followed by the search for operational consequences, while experiments are mainly used as illustrations (*teaching guided by Behaviourism - tell 'em and they learn !!*)
(EC, Science Education Now, 2007)
- Science Teaching **is not Innovative – not relevant, not interesting, not useful, and all too often boring.**

So what is PROFILES?

The acronym 'PROFILES' stands for

PROFESSIONAL

(Innovation 1)

REFLECTION-ORIENTED FOCUS

(Innovation 2)

on

INQUIRY LEARNING

(Innovation 3)

and

EDUCATION through SCIENCE

(Innovation 4)



In PROFILES

‘P’ stands for PROFESSIONAL in the sense that:

- (a) science teachers, as professionals, need to approach teaching in a modern, effective, evidence-based, professional way;
- (b) as professionals, teachers need to interact with the ‘community of practice’ i.e. other teachers in discussing, sharing and promoting advances.

'ROF' stands for

Reflection-oriented focus, in the sense that:

- the project recognises the importance of guiding teachers **to reflect on their teaching.**
- the project sees **teacher ownership** (*of the innovations*) as a key focus of attention for this project.

'IL' stands for

'Inquiry learning, or **IBSE** (Inquiry-based science education)

- This is a recognised need by the European Commission and will thus form **a major focus of PROFILES.**
- By necessity, IBSE encompasses **student-centred learning.** PROFILES embraces this.

'ES' stands for

Education through Science (EtS).

(see Holbrook & Rannikmae, IJSE, 2007, 29(11), 1347-1362)

- *This unique feature of PROFILES is taken as an approach in which **Education is the focus**, while the **context** in which this education is to be achieved is taken to be science.*
- EtS introduces a **new PROFILES philosophy**.
- PROFILES recognises that Science Education is about '**EDUCATION first**' and the science is the '**vehicle**' to promote this education.



Project aims and actions

The PROFILES project aim is to promote **enhanced scientific literacy (STL)** of students (STL as defined by PROFILES).

PROFILES sets out to achieve this aim through **an innovative approach to the professional development of science teachers** (The innovative PROFILES approach has 2-steps)

Base for PROFILES

- PROFILES builds on the ideas and teaching materials developed in the **PARSEL project** (www.parsel.eu).

PROFILES particularly relates to:

- **A Societal focus - socio-scientific scenario approach.**
- **Using a 3-stage model to enhance students' STL.**
- **An Education through Science – education focus.**
- **An emphasis on student Relevance and Interest .**



The PROFILES Approach

- Establishing close cooperation and networking of the consortium **with stakeholders** (see A5; C4).
- Providing professional teacher development through a **needs-driven approach** geared to innovative IBSE (see B1).
- Developing **stronger teacher professionalism** by enhancing **teacher self-efficacy** (can teach the PROFILES way)(see B8).
- Promoting **teacher ownership** of innovative PROFILES (**teacher reflects, disseminates & leads others**)(see C1-3).
- **Evaluating and Disseminating (Networking)** the PROFILES ideas, materials and outcomes for enhancing students' scientific literacy (see C5&6).

How will PROFILES operate ?

The PROFILES project operates by:

1. Establishing a well managed, collaborative and well monitored consortium, which intends to –
 - introduce PROFILES ideas into a multitude of individual educational systems and cultures,
 - but especially into the systems to which the project partners relate.

PROFILES sets out to

2. Ensure improved **students' science learning** by:

- offering **innovative professional development** opportunities for in-service teachers and teacher educators,
- as well as **meaningful and challenging education** for students within the school, pre-serve teachers in teacher education institutions and all in non-formal education centres.

PROFILES sets out to

3. Take into account a large variety of stakeholder's views
(those persons with an interest in the educational outcomes of students)

in seeking effective ways to **raise teacher ownership** (and hence self-efficacy - confidence and competence of teachers) of innovative science teaching approaches, based on IBSE and EtS.

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PROFILES sets out to

4. Develop methods and enhance approaches to **disseminate project ideas and successes** on a wide scale within Europe, and **promote networking** to raise teacher awareness and sharing Europe-wide.

Indicators of Success

Attaining the intended PROFILES outcome is exhibited *initially* by greater teachers' competence and self-confidence (**self-efficacy**) to promote IBSE-related science teaching (*which students find motivationally stimulating and of value for their development and future aspirations*).

The Ultimate Goal

- Interested and motivated students, enjoying science lessons and gaining greater STL.
- with Teachers taking up
 - **(Teacher) ownership** of the PROFILES way,
 - Exhibited by **self-reflection** and **leadership**,
 - And willing to undertake **dissemination practices** to support other teachers.

Achieving the Goals

This will be dependent on **convincing teachers that** methods studied and tried out in the PROFILES training are designed to:

- *improve the quality of their own science teaching for the benefit of students;*

convincing teachers that:

- those who participate in the longitudinal training programme experience gain in *self-efficacy* to such an extent that they feel they have a future role in convincing other teachers of the need to interact with PROFILES and seek support (e.g. science colleagues in their schools, from 'nearby schools', etc);

convincing teachers that:

examining their teaching reflectively and exploring concerns or negative impacts on students can impact on their teaching and be achieved, first guided by partners, but later by specific teachers (referred to as '*lead teachers*').

This step is designed to follow-on from the initial PROFILES teacher development and intervention, so as to raise **teacher ownership of developments** through self-evaluative approaches.

convincing teachers that:

- creating and participating in teacher networks (and other forms of dissemination e.g. describing their successes and student gains in publications or seminars, running workshops, talking about PROFILES teaching to pre-service teachers),
- can play an important role in aiding promotion of a **teacher's self-efficacy** and, through disseminating teacher ownership of PROFILES ideas, leads to greater **enhancement of the scientific literacy of students.**

The PROFILES hypothesis

It is hypothesised that teachers' confidence, (i.e. the *effective and sustainable improvement of teaching through the promotion of self efficacy and teacher ownership*)

- can be strengthened by means of ***collaborative interactions and through self-evaluative measures focussing on the teachers' reflective practices, as well as through formative and summative assessment of students' cognitive and affective learning.***

Issues we face

Reforms, which do not appreciate the **important role teachers' play** in change, often experience difficulty.

Imposed programmes run the risk of failing, if **teachers do not accept and understand the innovation** (Fullan, 1992).

A central issue is that improvement in educational programmes depends on concurrent processes of **teacher development**, which in turn implies work in a setting that enables **self-organisation and reflective practice** (Stenhouse, 1975; Schön 1983).



Operationalising PROFILES

PROFILES is designed, in the **Description of Work**, to be put into operation via **eight work packages**

WP 1 Management and Evaluation

As the name suggests, this is about Project Management and Evaluation especially finance, meeting deadlines for deliverables and responding to European Commission expectations.

It will also handle interactions with an External Reviewer and maintenance of the PROFILES website.

- **Lead partner FUB**

WP2 Partner support

This work package focuses on ensuring

Professional support and guidance for partners in being familiar with, meeting operational needs and interpreting project goals and actions, overcoming difficulties and cooperating with other partners, especially in sharing of experiences.

- Lead partner UTARTU

WP3 Stakeholders

Bridging a potential gap between science education researchers, teachers, students and local actors (various levels of stakeholders such as parents, company leaders and scientists) through networking and co-operation during the life of PROFILES.

- Lead Partner FUB

WP4 Learning Environment

Preparation guidelines to:

Ensure needs-related, teacher professional development training programme materials are available, plus

Identification of appropriate IBSE-related, 'education through science' enabling teaching modules (which can be modified and translated)

- Lead partner UTARTU

WP5 Teacher Professional Development

Planning and Implementing (based on teacher-needs) the (longitudinal) teacher development programme and inter-related classroom interventions through which teachers try out new ideas and approaches leading to teacher self efficacy in PROFILES intentions.

- Lead Partner WEIZMANN

WP6 Teacher Ownership

Builds on WP5 and, through self-reflection, case studies self-evaluation, support other teachers, raise the effectiveness and impact of PROFILES operations with a special goal of teacher ownership of PROFILES practices.

- Lead Partner WEIZMANN

WP7 Student Gains

Evaluating the effectiveness and impact of the PROFILES teacher professional development programme/intervention, [and the development of teacher ownership under PROFILES],

In student outcomes, especially affectively (attitudes, interest) but also in cognitive development, self-achievement and peer-peer interactions

- Lead Partner FUB

WP8 Dissemination and Networking

Dissemination of PROFILES outcomes on a national, international and worldwide level

And the establishment of PROFILES teachers' networks interrelated to other teachers' networks operating on a local, regional national or Europe-wide scale

- Lead partner UNI-KLU (and ICASE)



Thank you

I hope this was helpful

PROFILES and its Philosophy

Jack Holbrook, Imm. Past President, ICASE

- PROFILES is an innovative, **2-step**, science teacher professional development programme, supported within the FP7 European Commission programme.
- **Key terms:** *Nature of science (NOS), STL, Education through science, IBSE, PCK, Classroom learning environment, Student motivation, assessment, teacher self-reflection, teacher ownership, supportive educational theories, leader teacher.*

PROFILES – the ultimate target

To enable science teachers to gain teacher ownership of teaching in science subjects within the frame of the **PROFILES philosophy**, so as to:

- (a) implement PROFILES teaching to enhance STL;
- (b) create PROFILES identified teaching modules.
- (c) self-evaluate their guidance of students towards enhanced scientific STL through valid data collection and action research approaches.
- (d) play a professional leadership role in individually, or collectively, guiding and supporting other science teachers in more effective student learning towards enhanced STL.

1st PROFILES step for teachers

- The first essential PROFILES step, and perhaps the only step for many teachers, is to gain **self-efficacy** (especially in terms of competence and confidence) in using and adapting PROFILES teaching materials so as to enhance STL of students.
- PROFILES promotes teacher's self-efficacy through a longitudinal teacher professional support programme based on **self-identified, teacher needs**.
- It also endeavours to inform teachers of the **views from a range of stakeholders** on their expectations of **student gains** from teaching, and more explicitly from teaching through science subjects.

3 stage model to implement PROFILES

- The enhancement of STL through PROFILES teaching is via a **3-stage model**, supporting by appropriate teaching materials.
- These materials (modules) recognise the key role played by:
 - motivation (intrinsic motivation of students),
 - the need for student involvement in constructivist,
 - inquiry-based science education and
 - the desire to ensure learning through science subjects,
- [Recognising the need for knowledge, skills, attitudes and values, to be transferred to unknown situations and not just seen as acquisitions in a classroom or a scientist's preferred setting].

The 3-stage model – stage 1

- 1st stage. Setting the scene from a socio-scientific perspective (which may be complex) – introduced from a students' familiarity perspective through a 'scenario'.
- Through strong student involvement, this stage moves towards student identification of a need-to-learn science, geared to gaining a deeper understanding, appreciation and ability to decide geared to the socio-scientific situation.
- Stage 1 is thus designed as a motivational introduction to stage 2 – de-contextualised, probably simplified (depends on grade level and prior learning), inquiry-based science education learning, where science education is view from an 'education through science perspective' i.e. science education encompassing all goals of education.

The 3-stage model – stage 2

- 2nd stage. Inquiry-based science education to gain the appropriate knowledge, skills, attitudes and/or values warranted by the socio-scientific setting chosen.
- The setting determines the width of science concepts covered i.e. the concept map is defined by the need-to-know learning associated with the setting (as determined by the teacher).
- The 2nd stage takes up the majority of teaching/learning time, although the concept map is expected to be sufficiently limited so that the teaching does not go beyond 10 lessons in total per module.
- The 2nd stage can, of course, build on any prior learning that has come from earlier teaching modules, but prior learning is NOT a prerequisite (a unique feature of this approach).

The 3-stage model – stage 3

- 3rd stage. This stage consolidates the science learning in the re-contextualised, socio-scientific situation.
- Appropriate decision-making, eventually via consensus in a whole class setting, is promoted through argumentation and reasoning using suitable teaching approaches so as to interject the science learning into the social decision-making frame.

Generic skills

- In all stages, generic education skills are promoted, such as :
- personal attributes – i.e. ingenuity, initiative, safe working, critical thinking, reasoning;
- social skills – i.e. cooperative and collaborative working; leadership abilities and
- motivational attributes i.e. willingness to and perseverance.

Theoretical constructs

- The professional support is also based on theoretical constructs. For example, besides a student centred, largely inductive, inquiry learning approach, the teaching is based on constructivism rather than behaviourism (a common preference for unconfident teachers and the approach favoured by textbooks).
- The teaching rejects logical positivism, favouring a scientist's approach, and supports a societal, interdisciplinary frame of reference where relativism and 'education through science' promote a competency-based, holistic and interdisciplinary view of the educational provision.
- Social constructivism is favoured, aligned with activity theory, recognising the importance of the teaching being challenging and purposeful, yet within the Vygotskian 'zone of proximal development.'

Teaching modules

- The title of the module avoids unfamiliar, non-gender equity titles and thus focuses on an aspect related to the society, often associated with a dilemma, concern or issue.
- The wording of the title is specifically designed to be motivational for students and thus linked to an introductory scenario.
- The learning outcomes for the module encompass a range of educational needs and thus see science education as encompassing capabilities to be developed in students related to knowledge, skills, attitudes as well as values.
- The incorporation of student appreciation of the nature of science in terms of 'what is science, or scientific?', as well as scientific methods.
- The incorporation of values is not expected to be portrayed as a doctrine, but to enable students, through debate, discussions etc. to strive towards a consensus view and thus formulate, or reformulate their views based on the prevailing arguments being put forward.

Student tasks; teacher support

- The students tasks are clearly delineated in the teaching module, but in line with the development of student's based on self-determination theory – (Deci and Ryan), rigidity in the module is kept to a minimum.
- The inquiry learning goal is seen as open inquiry rather than guided or structured.
- Modules encompass a teacher's guide which is suggestive rather than prescriptive.
- Feedback for the teacher, or assessment strategies are also intended to support the direction, pace and emphasis within the teaching.
- Finally, the module gives support to those teachers in need of additional background of scientific ideas that relate to the module.



Thank you

I hope this was helpful