



## Local recruitment strategies developed

Deliverable report (D2.3)

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## Identification sheet

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## 1. INTRODUCTION

To achieve a critical mass of teachers involved in the inquiry labs, TEMI will develop and implement a clear strategy for teachers' recruitment. In fact, getting a large enough number of teachers to participate in IBSE training labs out of school time is very challenging, mostly because of the pressures they are under in school.

Therefore the recruitment strategy must state very clearly the objectives and benefits that teachers will get from training. It is crucial for the TEMI goals that the project is seen to offer, to the teachers involved, significant benefits that complement the schools' objectives.

Inquiry training labs have to improve both, teachers' mastery in conducting classrooms inquiry labs and teachers' awareness of what they are doing. Therefore the recruitment strategy needs to turn the perceived or real lack of disciplinary preparation of teachers into an opportunity: even under-prepared teachers should see in the TEMI labs a strong opportunity to get educational devices to make them better teachers. In order to reduce the gap among teachers that are disciplinary well and not well-prepared, inquiry training labs can foresee activities in which teachers (prepared or not) are, in general, not confident, but in which they are strongly and actively engaged. In fact teachers should be motivated to also undertake inquiry paths giving rise to questions and answers not already known to them before. These facts and opportunities should be made plain in the call for recruitment [TEMI Annex1].

Therefore a list of local key outcomes and benefits for teachers has to be prepared. The effectiveness of this list will be tested with teachers in each country to ensure the programme description is easily understood (recognising that teachers have little time to absorb complex marketing) and then refined if necessary. Eventually a country specific marketing flyer for the programme will be prepared and distributed, both electronically and in printed form.

Besides common strategies and objectives in teachers' recruitment, each training partner will use existing teacher networks and CPD structures, wherever possible, to add visibility and credibility to TEMI and its inquiry labs.

A very large gap between the practice of IBSE and the expectations of students and parents, and therefore also of headmasters, is established by national standards curricula and by the need to comply with the final examinations requests. A correct

recruitment strategy is therefore crucial to create groups of teachers coming from the same school and that moreover have and perceive a strong headmaster support. In addition, to enable the achievement of a strong impact, i.e. to increase the number of teachers reached by the project, TEMI plans to implement a cascade dimension of the training with the goal that each directly trained teacher should train by her/himself two further colleagues in the same school to adopt TEMI inquiries techniques, and to participate in the learning community [TEMI - Annex 1]. It is therefore evident that a strong involvement of stakeholders, especially those responsible for final test and assessment, should be appropriately inserted in teachers' recruitment strategies [TEMI - Report D2.1].

In the following sections you can find both the general and the local strategies for teachers' recruitment of the TEMI project.

## 2. GENERAL STRATEGIES FOR TEACHERS RECRUITMENT

In the Leiden meeting (6-8 November 2013), the TEMI partners found a general agreement on the following key-points. Necessity of:

- Involvement of a large spectrum of stakeholders
- Involvement of groups of teachers from the same school
- Involvement of headmasters
- Professional science ethos in the schools

Moreover, a strong support from the headmasters is to be fostered in order to ensure sustainability and to make sure that the approach gets through a well-done trial with teachers. Therefore a clearly stated set of "conditions for success" must be submitted to schools and signed by teachers and headmasters.

The TEMI partners found also a general agreement on the following channels for the recruitment of teachers.

- Direct contact with in-service teachers
- Science education students and related school teachers
- Already known enthusiastic teachers

- Press and/or newsletters
- Special events for dissemination
- Science centers (web pages and mailing list).

### 3. LOCAL STRATEGIES FOR TEACHERS RECRUITMENT

In the following pages the local strategies for teachers' recruitment of each TEMI partner can be found.

#### IRELAND

The University of Limerick team is planning the following recruitment strategies:

1. Publicize the TEMI project through a briefing article in the Autumn 2013 in "Chemistry in Action!" magazine (produced by Peter Childs) and in SCIENCE (the ISTA magazine). This will inform a large number of science teachers and allow those who are interested in participating to contact the team.
2. To work with science education students at the University of Limerick, particularly in their fourth year. A first cohort of four students has already been recruited. They will work on developing sample lesson plans using "mysteries" as the lesson starter for their Final Year Project (FYP). It has been decided to approach the topic of mysteries, as it is rather ill-defined, by starting with the well-developed idea of "Discrepant Events", as there is a large amount of literature in this area. The four students will be developing ideas for lessons in the areas of chemistry, biology and physics (for both the junior cycle – general science, and the senior cycle – single subject science). One of the students is developing an eight week science module for the Transition Year (an optional year between junior and senior cycles), using topics from physics, chemistry and biology introduced through discrepant events. The students will try out and evaluate their materials during their fourth year teaching practice. It is intended that the materials developed in these student projects will be used in the teacher workshops in 2014. (Students have been recruited, ethics approval has been obtained for their projects and they are working on materials to be ready by September 2013).

3. In the first instance it has been decided to recruit a group of about ten schools/teachers for the first cohort (in addition to the student teachers). Science teachers, known to the team members to be enthusiastic and willing to try new ideas, will be invited to join the project, subject to the support of their school. A number of teachers have been provisionally identified. A draft letter and description of the TEMI project has been prepared to send to school principals, having first made contact with the selected science teachers and ascertained their interest in being involved. (Individual teachers have been contacted, informally, by the start of September 2013; school principals have been contacted formally from September 2013).

It is intended in the long-term to try and involve all the science teachers in the school, so the group is looking for a pro-science ethos in the schools and strong support from the school principals, in order that different science teachers from the school can be involved in successive cohorts. This is to try and ensure sustainability of the project and to make sure that the approach gets a thorough and fair trial in the schools.

The second-level system in Ireland is quite diverse from other EU second-level systems, and so the Limerick group will attempt over the course of the project to involve a representative sample of school type (secondary, vocational and community-comprehensive and disadvantaged (DEIS) schools; as well as single sex and mixed schools. This is to ensure that the TEMI approach can be evaluated in Ireland across the whole second-level system.

#### NORWAY

The Hogskolen i Vestfold (HiVe) is planning the following channels for recruitment.

1. Direct contact with in-service teachers. HiVe has a substantial network of practical training teachers, teachers who previously have completed CPD-courses in science, and finally, teachers who completed their education at our institution. These teachers will act as liaisons at each school, and they will be contacted by phone or e-mail.
2. Science education students will be recruited from their own science courses as well as other teacher education institutions. These participants will be contacted directly, or via colleagues at other institutions.

3. Local press. An article covering TEMI is already underway in the local newspaper “Vestfoldbladet”, which covers the entire country.
4. HiVe plans to arrange an opening event with high-profiled researchers where press is invited.
5. Information to headmasters and Commissioners of Education.
6. At a national level, HiVe plans to reach teachers through several science centers. These centers will reach teachers via their webpages and email lists.

To ensure that the training delivered will have the largest possible impact, The HiVe team will advise that at least two, but preferably three to four teachers, participate from each school. Each school should also in their application outline how they plan to sustain and further develop IBSE at their school. TEMI’s relations to prioritised areas, e.g. the competency aim “The budding scientist” in the national curriculum, will be emphasized throughout the recruitment.

TEMI and IBSE fits well with the Norway national curriculum, and emphasizing this point in the recruitment process should be sufficient to make TEMI relevant for schools’ objectives.

So far, direct contact with local school authorities (which have been responsible for contact headmasters) and editorial newspaper articles have been sufficient to complete recruitment for the two first cohorts. For recruitment in the subsequent cohorts HiVe will continue to use the strategies outlined above, particularly benefiting from the already existing networks.

Currently, participation from two municipalities have been confirmed for the first two cohorts. In January, new contact will be taken with potential candidates for the subsequent cohorts.

In discussing TEMI with the local school authorities, HiVe team has stressed why it is so important that several teachers from each school participate, and these arguments have been heard (both by authorities and headmasters). In fact, several schools wish to send as many science teachers as possible.

Involving and “anchoring” TEMI with the local school authorities in each municipality will foster and influence the involvement of headmasters, that will be also contacted to sign a contract specifying the details of participation (e.g., a group of teachers from each school must participate).



## UNITED KINGDOM

In England, to guarantee a sufficient number of teachers are recruited and remain committed for the duration of the programme, it is necessary to have strong links to one or more of schools priority areas:

1. School accountability
2. Linking TEMI outcomes to the “School inspection framework”, which recognises the quality of teaching and curriculum planning.
3. National Curriculum changes from 2014
4. TEMI fits well with the area “working scientifically”. It also offers solutions to schools who will have more autonomy in curriculum planning for achievement in knowledge and skills.
5. Science department CPD priorities

Moreover, in England there is some evidence that schools are starting to recognise the value of best practice CPD which TEMI offers, that is:

- Subject specific CPD to offer newer teachers professional growth (rather than generic professional development)
- Long-term, sustainable PD like the TEMI programme, with high quality curriculum resources and online support, rather than just workshops
- Wanting to work in clusters with online networks for support, such as TEMI offers

The Sheffield Hallam University (SHU) has many channels into schools to reach all the schools in its region, and most schools in the country. The principles ones are:

- CSE encompasses a CPD organisation, which is in contact with all secondary schools in the Yorkshire and Humber region (one of 9 in the UK). All schools get the termly programme of events.
- The Science upd8 mailing list, received by 20,000+ UK science teachers.
- Newsletters from the science teacher professional body, and the major scientific societies

In particular:

### **to reach school management and teachers**

The SHU team will use several contacts lists:

- heads of science departments for schools in the region around SHU
- teachers subscribed to ‘science upd8’ and WIKID curriculum – our inquiry-based projects

These lists allow to reach over 130 Heads of science, and up to 1000 science teachers. The focus on heads of science is generally the most effective way of reaching a decision maker who can decide about the importance of the programme, and which teacher might go on the Workshops. On the other hand, e-mailing more "enthusiast" teachers in the department also works, as they take the flyer to their head to persuade them to give permission to attend.

#### **For the appropriate marketing materials**

SHU has already developed a 2 page flyer for the prototype workshop [see Appendix 1], it describes the reasoning behind the content i.e. what factors would make it most persuasive, from the title, to the evidence provided.

#### **For the timescale for recruitment**

Two pilot workshops are planned at the end of February, and end of March. The SHU team will be contacting teachers, from 12th December.

#### **For fostering the involvement of groups of teachers from the same school**

The SHU team will invite the Heads of Department if they want to send 2 teachers to the Workshop. At the Workshop, the team will encourage teachers to share the lesson they have created and curriculum materials with other staff, as part of their action planning process.

#### **For fostering the involvement of headmasters**

When teachers sign up, The SHU team give them a task to discuss their involvement and goals with someone else, for instance a senior colleague. This is what they have found works in the UK. If the Head of Science is committed to the programme, that is sufficient. They are likely to show the Head teacher, but there is no need to approach them directly.

#### **TEMI is supposed to offer clear benefits to complement school's objectives. This will be done by**

1. helping teachers develop towards being an outstanding teacher.
2. helping teachers learn to use enquiry for 'differentiation' – i.e. lessons aimed at helping each student progress.

In a high stakes assessment system like that of the UK, enquiry has little power itself to get teachers out of school for a Workshop. The only effective way to do this is to find a connection between enquiry and the challenges that teachers face. In the UK

the biggest challenges are – fear of doing badly in an inspection, and the fear of students' not doing well in external exams.

The SHU team realised TEMI can help these through our model which proposes different levels of enquiry and student responsibility. This is known as differentiated enquiry. Differentiation is teaching which adapts to the differing needs, capabilities and interests of students, so that every student makes fast progress every lesson. In the UK, this is the working definition of "outstanding teaching". A workshop which helps you progress towards being an outstanding teacher does have power! Differentiated enquiry is the ideal hook in the UK. State schools from a variety of backgrounds will inevitably attend. For paying particular attention to reach teachers coming from difficult schools, SHU will specifically invite teachers from more disadvantaged schools to attend inquiry labs. The nature of the programme makes it likely that it will appeal to many of these schools already.

SHU will focus on 11-16 students, because it is best to focus the already prepared curriculum materials of the past and present years, when teachers are interested in promoting enquiry.

#### AUSTRIA

In Austria the UniVie team faces the same problems as will be described for Italy (see below). Teachers are used to consuming in short term PD courses. Furthermore, there is a strict way of proceeding concerning the announcement of PD courses: only teacher education colleges can announce PD seminars. Moreover, PD courses have to be announced in May or in September for the next term.

The UniVie team subscribes to the summary of Roehrig and Luft (2004) [Roehrig and Luft (2004)]: "Common impediments to implementing inquiry environments include: lack of administrative and collegial support [Brickhouse and Bodner 1992, Adams and Krockover 1997, Shulman 1986] lack of pedagogical skills [Adams and Krockover 1997, Shulman 1986], lack of time [Loughran 1994], inadequate knowledge of the nature of science [Brickhouse 1990, Duschl 1987], and inappropriate curriculum materials [Adams and Krockover 1997, Beck et al. 2000, Brickhouse and Bodner 1992, Veenman 1984]." .

The catch words for Austrian teachers are inquiry-based science education and materials. When announcing the PD courses, UniVie will describe these aspects as the benefits for the teachers. The mysteries make the PD courses innovative and/or

different from other courses UniVie offered so far. The UniVie team is planning to find out before the PD course which school types and contexts (age of students, difficult surroundings, ...) the teachers work in, so to adapt the PD course to the pre-conditions of the teachers.

For a conference in Klagenfurt, Austria, the UniVie team called together the local stakeholders of chemistry education. The meeting took place on September 24th 2013. Among other topics UniVie introduced TEMI and found two persons of contact for two states of Austria so far – Vorarlberg and Styria. The PD in Vorarlberg will take place in March and April 2014 and is announced to science teachers (the conference takes place every year and UniVie will use this platform in 2014 again).

On November 12<sup>th</sup> there was a so-called “Inquiry Day” where UniVie offered a market stall advertising TEMI. The presented mystery was very well accepted and some teachers contacted the TEMI UniVie team for further PD. For the next presentations (additionally to a poster) UniVie will print flyers for the teachers to take home.

In February and in March 2014 there are two nationwide PD weeks for chemistry teachers where UniVie will offer TEMI workshops for teachers and invite them to come back to follow-up sessions. These PD weeks take place every year and the TEMI UniVie team will give start-up workshops there in 2015 as well. Mysteries and flyers will function as marketing materials.

For winter semester 2014/15 UniVie plans the first professional development course in Vienna. It will be a regional course which will be announced at the Teacher Education College Vienna which is in charge of in-service education. Every teacher must have the signed permission of the headmaster to participate in a PD course.

Furthermore, UniVie will offer school internal PD courses and across-school PD courses, so that more teachers of the same school can participate. UniVie will address already known teachers and invite other teachers by using the address lists of Austrian science networks.

## ITALY

In Italy there is a particularly difficult situation which influences teachers' motivation, due to a lack of social recognition for the teachers who are more engaged and work more; therefore UMIL has to work hard to convince them of the value of the TEMI offer.

Moreover, there is a certain degree of resistance towards new proposals/methods/approaches. Reasons for that can be found in the request of more time for teaching, in the jealousy of the colleagues, and in the possible opposition of students and parents. On the other hand The UMIL team knows that there is a great request of high quality formative activities, especially if they are free of charge for the schools, like the TEMI ones.

For the above reasons it is essential that the teachers involved are personally convinced and motivated, but it is equally important that they are supported by institutions, such as the Ministry, school managers, teachers' associations, and stakeholders in general. For this purpose UMIL have already taken contacts with the Italian Education ministry [Report D2.1], with the Italian association of physics teachers and with the Italian physical society, in order to have an official partnership with them.

UMIL has created a partnership with ministry, teachers associations and local stakeholders that will enable us to contact the schools through an official channel (for example ministry website, letters to the schools...). This will be done in order to promote the project and to make a call for teachers/schools interested to participate.

In order to be accepted, teachers' participation requests must be agreed by their school headmasters. In fact, not only headmasters should be informed of the activity, but it is also necessary that they agree with the program, as they will be asked to support the teachers who participate (for ex. finding substitution when necessary, informing students and families etc.)

This will be a pre-selection, necessary to estimate the number of teachers who are interested in the project. In particular, the UMIL team will explore the direct use of theatre as a tool to introduce teachers to IBSE.

UMIL is planning to introduce teachers' training starting with a theatre show. The UMIL team has a ten years experience in this field, with five theatre shows addressed to students of various ages, teachers, but also general public, in which mysteries,

caused by not understood or misunderstood scientific phenomena, are introduced [Carpinetti et al 2011]. UMIL will translate and transfer the show to theatre companies of some of the project countries and share the know-how with them, and organize performances, so that partners can attend the show and verify its utility as a vehicle to produce emotional involvement. Teachers/school experts from a number of the cohort sessions will attend and study the show in the enquiry labs/teacher training seminar series (e.g how the attention of the audience is caught by the mysteries and scenario). They would then work on it in subsequent sessions in the enquiry labs.

A first fundamental group of people that are indispensable for the success of the projected inquiry labs are experienced teachers. They will be involved in all the functions thanks to their deep knowledge of school, teachers and related mechanisms and issues.

UMIL has contacted a group of teachers that has been working with the Physics Department of the University of Milano for a long time in various reasons. UMIL has involved them since the very beginning, in the planning and exploratory phase. In the following, they will help the UMIL team in the development of the enquiry context, in the design of resources, but also in promoting a cascade mechanism. Their role of teachers will be fundamental to help other teachers to overcome their natural resistance to IBSE and to identify external challenges in the introduction of IBSE in the classrooms [Report D2.1].

One pilot inquiry lab, with well-known teachers already recruited, is planned in March 2014.

#### ISRAEL

In order to motivate teachers to participate in the TEMI project, The WEIZMANN team decided to conduct a pilot summer course of two days (24.7.2013-25.7.2013) with 25 science teachers, in which it has been talked about mystery scientific stories and conducted a few inquiry-type experiments in which the WEIZMANN team tried to embed some kind of mystery. All the teachers were aware of the fact that it is a preliminary start of the new project, and that when they will continue the project, the whole procedure will be much more structured.

The WEIZMANN team has opened a national TEMI website:  
<http://stwww.weizmann.ac.il/g-chem/TEMI/>

The materials – worksheets and PPP will be written in Hebrew, but the titles will be in English as well.

The recruitment of the teachers has been (and will be) done with the help of the superintendents (national inspectors), regional consultants, and high school headmasters of the teachers whom we wished to recruit. The WEIZMANN team has translated the TEMI press release, and sent it to the people mentioned above.

The teachers who attend the previous workshop expressed (so far) their readiness to continue and take part in the project when it will start.

#### NEDERLANDS

The Leiden University team has made contact with:

NOVA: Dutch research school for astronomy (consortium of astronomy departments at Dutch universities, involved with high school teachers)

iCLON: High school teacher education of Leiden University

WND: Working group for physics education, part of the NVON (Dutch Association for Education in Sciences)

The Leiden University team will present five "mysteries" around European telescopes at the annual Woudschoten Teacher Conference in December, which is astronomy themed in 2013. Moreover the team setting up a collaboration with iCLON to arrange more teacher trainings.

#### GERMANY

The University of Bremen will use a decentralized strategy of training to influence a wide range of schools all over north-western Germany.

Trainings will take place in different cities in the north-west of Germany. The initial and piloting training will be done at the Universities of Bremen and Dortmund with schools from already existing school-networks organized by the University of Bremen in the cities of Bremen and Dortmund.

The other trainings will take place in different cities. We will recruit “TEMI-Partner Schools” in these cities. Negotiations with several schools have already been started in the cities of Wilhelmshaven, Lüneburg, Handrup, Dortmund, Bremen and Bochum. Initial contact has been made with schools in Ankum, Schwarzenbek, Bochum and Werl.

The range of schools and participating teachers covers different types of secondary schools. It includes grammar schools, middle schools and comprehensive schools. The majority of the “TEMI-Partner Schools” will be comprehensive schools covering the whole range of achievement. Some of the schools that already agreed to participate are schools from surrounding with difficult socio-economic situation and a high rate of children with migration backgrounds (e.g. in Bremen and Wilhelmshaven). However, other schools are grammar schools from a more rural and better socio-economic environment (e.g. Handrup and Werl). We suggest that TEMI can be interesting for the whole range of student achievement in science education.

“TEMI-Partner School” will provide a platform. The school will participate with their science teachers to foster involvement of groups of teachers from the same school. However, the schools will invite other teachers from schools in the local surrounding too. Some of the schools have already such networks with neighbor schools that we used for in-service training courses in the respective schools.

Contact with the schools mentioned above has already been made. Via contact teachers the headmasters of the schools will be involved. With the “TEMI-Partner Schools” we will exchange official letters of intent to cooperate in the TEMI-project. In the letter the clear benefit for both sides is outlined. Schools should be free to make advertising with being a “TEMI-Partner School” on their website. The benefits for the teachers are innovation, potentially more fun and better achievement in their classroom. The teachers will become members of a professional collective of learning and innovation. The schools are getting a more sustainable link to the University of Bremen.

Concerning the timescale, recruitment is ongoing, the start with the training can begin in spring 2014. Further “TEMI-Partner Schools” can enter the project later.

#### CZECH REPUBLIC

In the Czech Republic, the Faculty of Science of the Charles University is participating in the TEMI project. This faculty has a long tradition in preparing science teachers for their school practice and in cooperating with these teachers, especially biology and chemistry teachers. At this time, There is a database with about 400 contacts for



concrete teachers of these subjects in the whole CR with which we are in constant touch.

Science education is guided by curricular documents which are valid since 2007 (primary schools) and 2009 (secondary schools). These documents generally promote modern teaching methods, but almost everywhere the traditional teaching methods persist. Because of this, IBSE is something completely new for Czech teachers.

The first big meeting, where chemistry teachers and other science education stakeholder were informed about the TEMI project, was the Market of Ideas of Chemistry Teachers, which took place on 4th and 5th October in Tábor (south Bohemia). Under the supervision of the Czech Chemical Society, about 50 teachers participated. (The representative of TEMI in CR (Hana) is also the chairwoman of the section of chemical education and a member of the committee of this society, in which all the people who want to improve chemical education in our country meet regularly.)

Another meeting with the goal of informing about the TEMI project had about 100 participating science teachers and delegates of stakeholder. This meeting took place in Vysočina (south-east Bohemia) on 18th and 19th October.

The third meeting with biology, chemistry and physics teachers and representatives of stakeholders is scheduled to January 2014.

In the period from July to October, the preparation of a program for IBSE teacher training was under way. Today, this training program is ready to use. We expect that during the pilot phase, we will ask the teachers in our database to participate. After that, other interested teachers can participate.

The first training should start in January 2014. 6 to 10 science teachers with some previous experience with IBSE will participate. We expect that in cooperation with them, we will adjust the concept of teacher training and that these first teachers will become new lecturers for the following trainings. We expect the start of the second training around May or June 2014.

At the same time, the Prague team offers the student of teaching of chemistry and biology optional lessons about IBSE (1 semester, 2 hours a week).

The team will use materials made here and in other countries participating in the project for the trainings. At this time, they are finishing work on the first four

materials for IBSE teaching – two from biology (How does the plant life begin, How does water travel in plants) and two from chemistry (What is lighter and what is heavier, What is a mixture and how to separate it).

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## APPENDIX 1

### SHU FLYER FOR THE PROTOTYPE WORKSHOP



# Your Apprentices are Waiting



A workshop on differentiated enquiry for outstanding teaching

We can help you overcome 3 big challenges of science teaching:

- 1 motivate students to grapple with an abstract body of knowledge
- 2 succeed in the 2014/15 Curriculum, which will assess deep knowledge & working scientifically
- 3 impress OFSTED by showing that each student makes progress, every lesson.

To succeed means thinking less about the syllabus and more about expertise. Essentially, you are a 'master' at building knowledge and doing enquiry. Students are your novices, or apprentices. They are following a 5 year apprenticeship – called KS3 and 4, during which you will transfer to them your thinking patterns, skills and attitudes. After which, students will have not only gained enough knowledge to get their grades, they will have matured into scientific thinkers.

Differentiated enquiry offers a step-by-step path towards these goals for all students. In the workshop, you'll learn to master its 5 methods.

Your Apprentices  
are Waiting  
**CPD Workshop**

22<sup>nd</sup> October, 9.30am–4pm  
Centre for Science Education,  
Sheffield Hallam University, S1 1WB

**The workshop is focused on outstanding teaching**

- Practice a range of differentiation strategies to challenge learners.
- Teach towards independent learners and scientific thinkers.
- Engage and motivate learners, using 'mysteries' and drama.
- Evaluate curriculum materials that integrate skills and content teaching.
- Hone your skill in using collaborative learning and peer review.

**The workshop is free. Schools will receive a bursary of £150 per teacher.**