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Report on the activities of the Community of Practice (CoP) II

SAILS
Strategies for Assessment of Inquiry Learning in Science

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D5.5 Report on the activities of the Community of Practice (CoP) II

Authors: Mark Melia, Eilish McLoughlin, Deirdre McCabe, Odilla Finlayson
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Project coordinator: Dublin City University
Contact: info@sails-project.eu
Website: www.sails-project.eu

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Table of Contents

1 Introduction

This report describes the activities of the Communities of Practice (CoP) which have been implemented as part of the SAILS project. It follows on from *D5.4 Report on the activities of the Communities of Practice (CoP) I* which described participation in the CoPs from their launch until the end of 2013. This document will follow the same general structure found in D5.4 allowing for comparisons to be made with the previous deliverable.

1.1 Overall Objectives of the COP

The aim of the CoP is to bring practitioners together into a learning community. The community should be an active community where participants actively contribute in the form of discussion forums and sharing of resources.

The overall objectives for the CoP are as follows:

- The CoP will engage teachers interested in IBSE and promote itself as a place to engage, learn and reflect about assessment and inquiry and a facility to collaborate both nationally and internationally.
- The CoP will become a flexible and informative resource for science educators in IBSE and assessment, growing and sustaining itself beyond the lifetime of the project.

1.2 COP Overview

The literature generally converges on the definition put forward in Wenger, 1998 on what constitutes a successful CoP. This definition contains three key aspects:

- A domain – a body of knowledge that creates a common identity among participants;
- A community – a group of people who are interested and care about the domain. These people create a social fabric of the CoP;
- A shared practice – is a method of working developed by the community to be effective in the domain.

This idea of a CoP was further explored in (Wenger, McDermott, & Synder, 2002):

> *Groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.*

In the context of the SAILS CoP the domain relates to the body of knowledge around Inquiry-Based Science Education (IBSE) and assessment of inquiry skills. There are then two distinct communities that can be identified in the SAILS CoP:

- Country communities where SAILS project member collaborate with teachers and develop units and case-studies.
- Practitioners' communities – where teachers support each other in implementing IBSE and assessment in their classrooms. This community may be also facilitated by SAILS project team member.

A main objective of the SAILS project is to share classroom practice and to identify effective methods for assessment in IBSE.

The SAILS online CoP portal has been development and operates at two levels:

1. National CoPs for each of the countries participating in the SAILS project:
   Belgium, Denmark, Germany, Greece, Hungary, Ireland, Poland, Portugal, Slovakia, Sweden, Turkey, United Kingdom.
2. An International CoP providing support and a common central forum.

1.3 COP BENEFITS

CoP members avail of the following benefits:

- Resources - Access to publications and other material output from the SAILS project;
- Forums - The facility to discuss and comment on Inquiry-based Science Education (IBSE) issues and share ideas with other likeminded contributors, both nationally and internationally;
- Events - Access to information on upcoming events as well as the opportunity to promote them.

From the CoP members' perspective, the overall objective of the CoP is to maintain and grow teacher interest in and use of IBSE and IBSE-related assessment frameworks. The CoP presents an opportunity for teachers and educationalists who have attended SAILS workshops or attended lectures/seminars about the SAILS project, to deepen their knowledge through active participation in their national (and international) CoP.

1.4 REPORT OVERVIEW

Section 2 presents a review of the engagement with the CoP platform on the SAILS project portal. This will focus on three key metrics:

- Membership – the number of members in a specific CoP.
- Discussion – the amount of discussions taking place in a community.
- Resources – the number of resources made available to the community by the community.

Section 3 discusses how partners are using the CoP as part of their teacher education and also describes other CoPs that their teachers currently use. These existing communities can be maintained either virtually or physically. Virtual CoPs outside of the context of the SAILS project may be maintained through mediums such as email or social media. Physical projects may be maintained through forums such as meet-ups, conferences and workshops.

Section 4 reports on the joint SMEC & SAILS conference which was held in Dublin City University on the 24-25th June 2014 with the theme "Thinking Assessment in Science & Mathematics". A key element of this conference was to provide a platform for a physical CoP that facilitated teachers to share their experience with implementing inquiry and SAILS assessment strategies within their teaching practice. 23 second-level in-service teachers presented talks on their experience with implementing inquiry teaching and assessment within their own classrooms and 62 teachers discussed their experiences using posters. The format of this conference was unique in that it brought together both practicing teachers and researchers in science and mathematics education together to discuss IBSE and assessment from both practice and theoretical perspectives.

Section 5 concludes on the use of the various aspects of the SAILS CoP to date and raises key challenges for maintaining a sustainable CoP.

2 SAILS CoP portal

2.1 CoP Membership

The graph in Figure 1 shows the membership of the CoP in each participating country. The number of members represents those users who do not have an administrative function within the CoP. In essence we assume those with no administrative function to be teachers in the CoP.

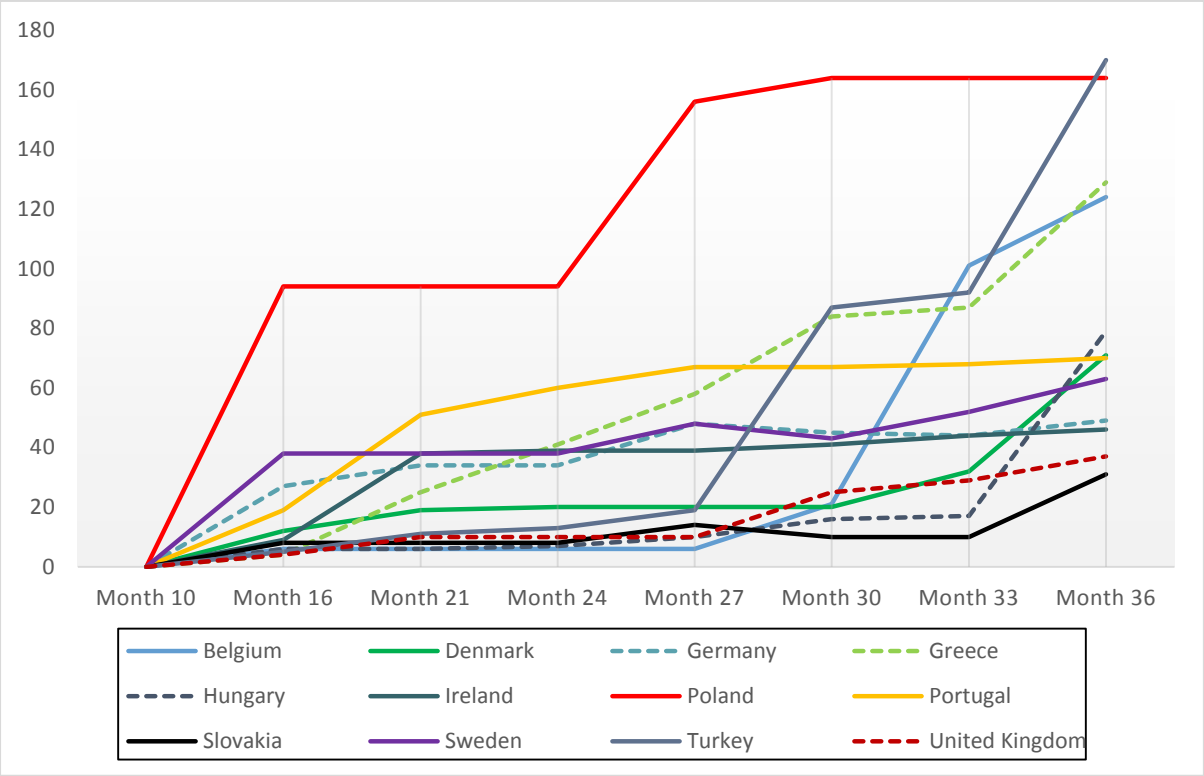

FIGURE 1 MEMBERSHIP OF SAILS COP

The majority of teachers either join the CoP as a result of a SAILS training workshop or through an email request to the CoP facilitator. Teachers participating in SAILS training workshops are automatically registered as members of their national CoP. There is a wide variation in membership across the CoPs with higher memberships in Turkey (170 members), Poland (164), Greece (129), Belgium (124).

Table 1 below gives a breakdown on the teacher membership for each participating country.

Country	Members
Belgium	124
Denmark	71
Germany	49
Greece	129
Hungary	79
Ireland	46
Poland	164
Portugal	70

Country	Members
Slovakia	31
Sweden	63
Turkey	170
United Kingdom	37

TABLE 2 MEMBERSHIP OF SAILS COP

The rate of growth of membership is still relatively slow although we can see short rapid increases in membership which tend to coincide with teacher training events.

2.2 SAILS CoP Discussions

CoP members can create discussions on topics of interest. Members have the facility to add a new discussion and notify some or all CoP members that the discussion is being added. Clicking on a discussion shows the contributions of the members who are part of the discussion. It also enables the viewer to post a new comment to the discussion.

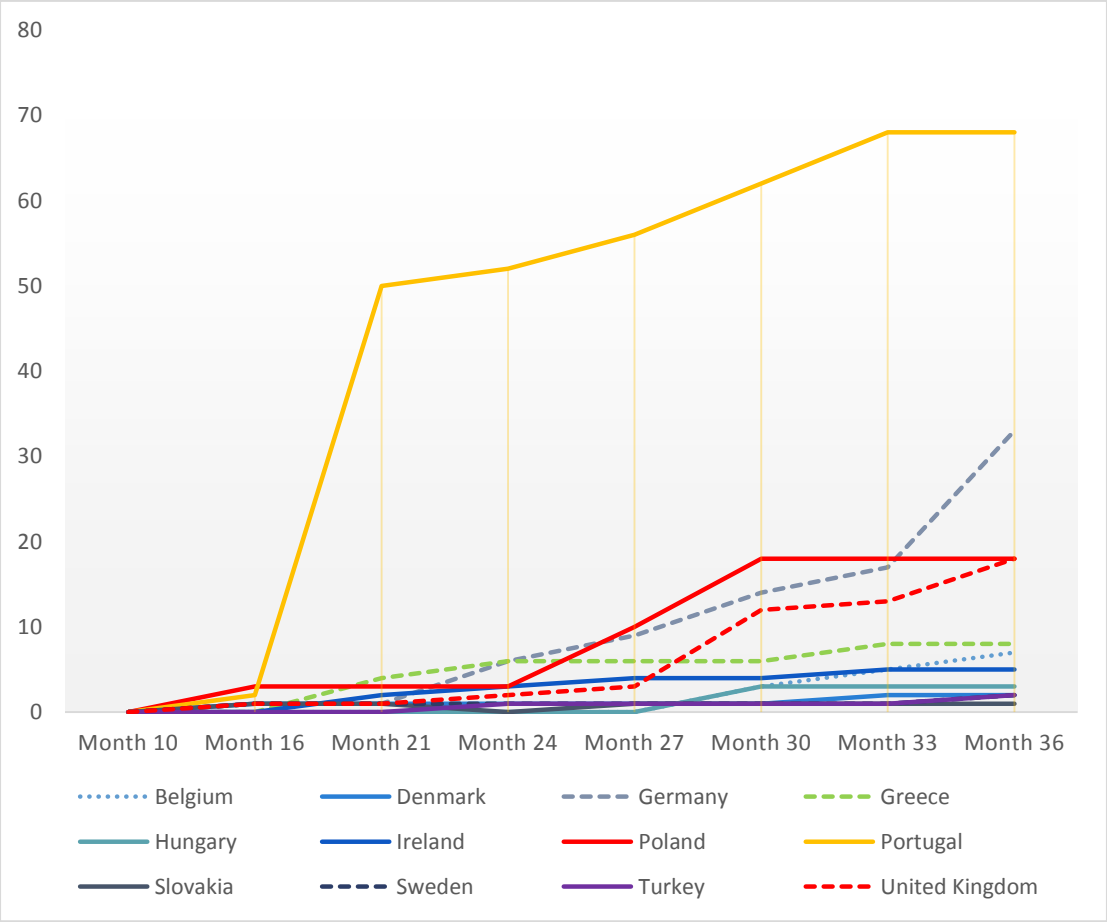

FIGURE 3 DISCUSSIONS AMONG SAILS COPS

The amount of discussions is a good indicator of the level of participant activity within the CoP to date there have been few discussions within any of the CoPs, with the obvious exception of the Portuguese CoP, as shown in Figure 2. However over the last year there have been very little new discussions created in the CoPs. Looking further into the discussions also reveals that very few of the

discussions are initiated by teachers but are in fact started and only contributed by SAILS project members. Indeed much of the interaction is between the SAILS teams in each country and not practitioners. This points to limited engagement by CoP members, across all CoPs.

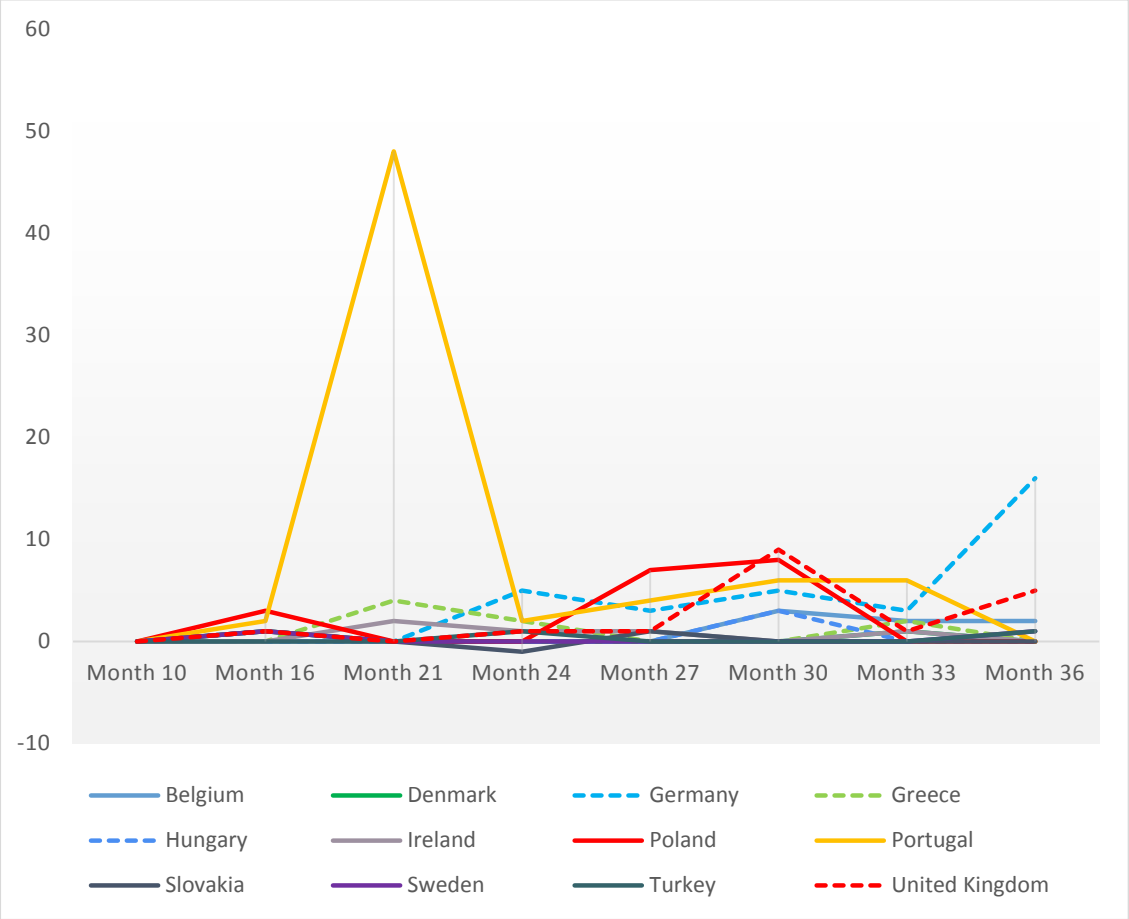

FIGURE 4 NEW DISCUSSIONS

SAILS beneficiaries, Intel and ATiT are working on a strategy to make the CoP more relevant and accessible to practitioners in each country. Details of this approach will be outlined in the next CoP deliverable (D5.6.).

The effects of the joint SMEC & SAILS Conference "Thinking Assessment in Science & Mathematics" which was held on 24-25 June 2014 in Dublin City University in Ireland can be seen in Figure 4 as there is clearly an increase in the number of new discussions taken place in many of the SAILS CoPs. We assume this originates from face-to-face conversations between teachers that took place at the event and continued online through the SAILS CoP portal.

2.3 SAILS CoP Resources

The resources section contains material (e.g. documents, images, videos, web links, etc.) that members have uploaded to the CoP. Members have the facility to add a new resource and notify some or all CoP members that the resource is being added. Members can also search for resources under a keyword search or a guided search. In addition, there is also a Folders section for materials. This has been included for users who prefer a folder structure for documentation, rather than the searchable Resources function. All members of the CoP have access to the resource and folders sections. The quantity (and quality) of resources is an important factor in making each CoP relevant and interesting to its current and future membership.

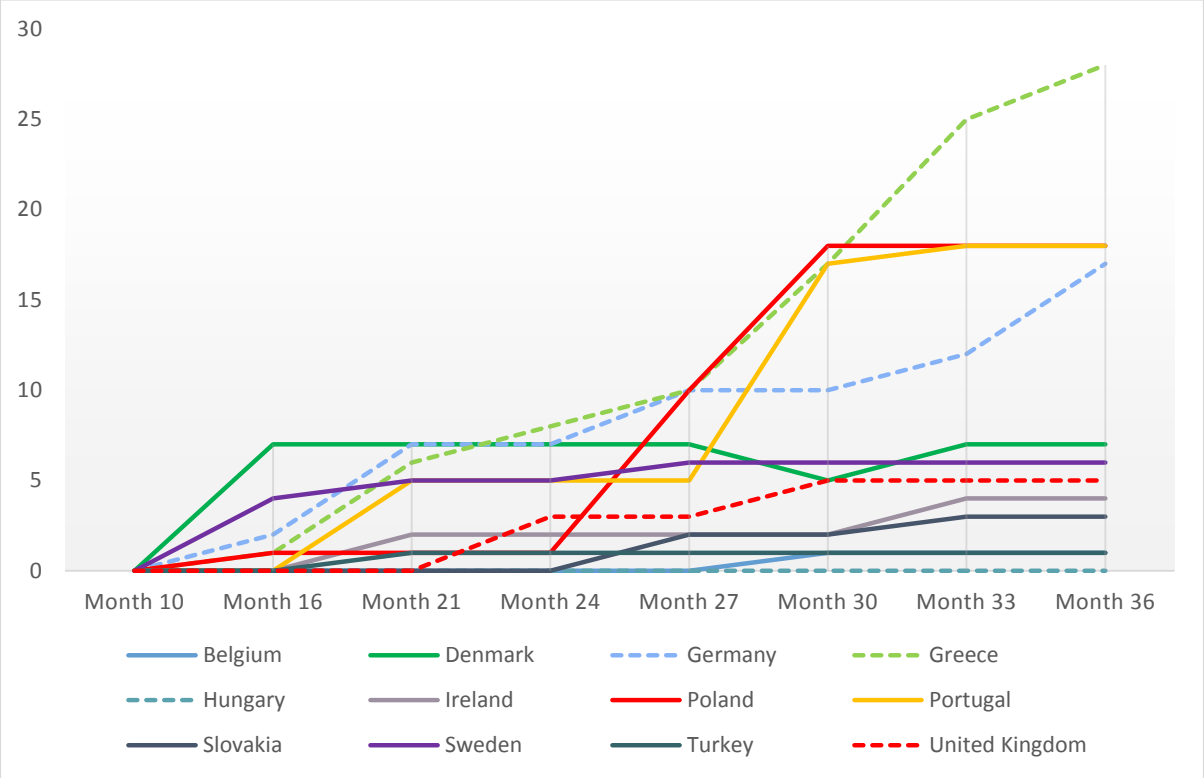

FIGURE 4 RESOURCES IN SAILS COPS

As can be seen in Figure 4, the amount of resources at the end of 2013 was low. During 2014 there has been some increase in the number of resources. Greece has steadily being adding resources to the CoP and now has 28 resources in their CoP. A large increase in resources from 2013 can be seen in the CoPs of Germany (now 17 resources), Poland (now 18 resources) and Portugal (now 18 resources). This been said at this point there has been disappointing amount of use of resources. Most resources have been added by SAILS team, and very few by practitioners (notably the Portuguese CoP has 7 resources added by teachers).

3 COP Experience by Country

In this section we take a look at each individual participant country looking at how they use the SAILS CoP and also if there are any active CoPs in that country outside of the SAILS CoP project portal.

3.1 Belgium

The CoP in Belgium is principally used for workshop activities but facilitators do not limit its use to this. When a workshop is being organised science teachers are invited to subscribe to the workshop as well as being invited to the CoP. The CoP is mainly a place for trainers of the workshop to share materials used during the workshop or materials (units from SAILS) to try out in the classroom, but also a place for workshop participants to provide feedback and ask questions. The folders tool in the CoP SAILS portal respond to this need, as this is an easy tool to upload materials (SAILS units to try out in the classroom), and easy for teachers to download material. In the discussion tools separate discussions were set up to discuss on the topic of the units more in detail – we are still in the process of trying out the materials in class so the discussions are limited for the moment. Discussions are also used to announce any other practical information about the workshop or "homework" in between the sessions. The resources are not used extensively, only one resource was uploaded with a link to the information webinar that was held prior to the workshops.
Outside of SAILS science teachers in Belgium are using VeLeWe http://www.velewe.be/ – Association of Flemish Science Teachers (annual event, other events, and newsletter) to communicate and discuss science teaching and learning. There are also many offline events and meetings where science teachers come together face to face.

3.2 Denmark

The Danish team are using the CoP to share and distribute material. This CoP only uses folders to do this as the materials principally centre around the workshops for which the folders are best fit for sharing material.
Teachers in Denmark are using national CoPs outside of SAILS and also using Facebook as a medium for CoP activities.

3.3 Germany

The SAILS CoP portal is principally used to share new teaching material (e.g. SAILS units, units from other IBSE projects) and to document and share the output from the German teacher workshops. The main motivation for teachers to use the German SAILS CoP is access to these materials.

German SAILS facilitators also use the German CoP to announce upcoming workshop, events or to call participants attention to specific literature.

3.4 Greece

In Greece, the SAILS CoP is being used as a repository for the learning resources, which are being used during the training workshops. The trainees need to register in order to access to these resources (PowerPoint-slides, scenarios, assessment rubrics, case studies, etc.) as well as upload their own scenarios-deliverables, which are mandatory for the successful completion of the training seminar.

Furthermore, UPRC is advertising the SAILS CoP on info days to teachers so that they can use it as a one stop shop for learning resources about IBSE and assessment of IBSE activities.

3.5 HUNGARY

The Hungarian SAILS CoP is used to share resources. These resources are principally used around the time of workshops. There is no other CoP in operation that the Hungarian SAILS team is aware of.

3.6 IRELAND

Irish SAILS CoP is principally used to share workshop material and SAILS units with teachers. Teachers tend not to use the SAILS CoP when communicating with SAILS and opt for email communication.

Irish teachers would also seek resources and training from PDST (http://www.pdst.ie) and tesconnect (http://tes.co.uk).

3.7 POLAND

Poland sees a lot of CoP activity around the time of workshops. This is generally centred around the sharing and distribution of material but teachers also use it to discuss and reflect on units after they are introduced.

Our understanding is that Polish teachers do not use any other CoPs

3.8 PORTUGAL

The Portuguese SAILS CoP port is used more around the time of workshops, but it is also used it to disseminate other activities and projects (on a smaller scale). The CoP supports for teachers' online interaction and to share all the resources produced and used in the workshop (mainly the folders section but also the discussions section). Collaborative work within the CoP was improved by the promotion of discussions of assignments produced and personal experiences.

Teachers were asked in the SAILS teachers' education programmes to identify advantages and constraints that they felt using the CoP. The access to other teachers' work and the possibility to share their own work was the main advantage identified. The possibility of working asynchronously was also referred as well as the rapidity with which the communication settles down. The main constraints are related to personal time management and the SAILS CoP layout is not intuitive which contributes to increase the difficulty on using it. To improve the CoP effectiveness, teachers suggest it to be disseminated, the creation of discussion forums on specific topics and to make it friendlier to users.

3.9 SLOVAKIA

The SAILS CoP is being used in Slovakia particularly for student (pre-service) teachers. With in-service teachers the CoP is principally used around the time of workshops.

The UPJŠ operates a range of courses for pre and in-service teachers. CoPs operate within these courses during the lifetime of the course.

3.10 SWEDEN

Swedish CoP is mainly used to share resources and reports about different projects. There is an increase in usage during workshops. Email is generally used to between teachers to share ideas.

3.11 TURKEY

In Turkey the SAILS CoP has been used to host IBSE related resources in the folders section and initiate discussions. Resources have included details on activities, conferences and new about IBSE events. Some teachers have uploaded their own material and shared their experiences of IBSE through the platform.

Email is being used as an alternative CoP communication mechanism to the SAILS CoP portal site. There are also a number of CoP initiatives within the Ministry of Education in Turkey:

- http://www.vitaminogretmen.com/
- http://www.ogretmenlersitesi.com/

3.12 UNITED KINGDOM

The UK have had some active engagement from teachers such as them uploading case studies. The first two cohorts of teachers have found it very frustrating trying to navigate the CoP and don't like using it as it's 'just too difficult'. They do not find the search engine effective and therefore no longer engage with the CoP unless directly instructed to and sent a specific hyperlink to the file. The new cohort 3 have also had some issues registering and getting 'unblocked' but we think we have overcome this hurdle but their first experience of the CoP has not been as straightforward and easy as they had hoped. For this reason UK SAILS now tend to populate folders and sub folders with relevant information (particularly pre and post a workshop) and then send them each a message and a hyperlink to the exact folder / file location via the UK CoP system (with instructions on how we want them to engage with the material). This message might be 'please upload your case study here by xxx' or ' here are the materials from the workshop 27th November'. Some UK teachers in cohort 1-2 have uploaded a case study to our designated folder, but yet again they have only managed this because the SAILS team provided them with the hyperlink. Some of these same teachers have successfully uploaded examples of units they have tried out with their students. However there has been virtually no discussion between the teachers or comments on each other's units.

The UK team are currently working in a proactive way to get greater engagement from UK teachers in cohort 1, 2 and 3. The UK have recently created a clearer file structure within the 'folder' tab where the title of the file clearly reflects its content e.g. 'useful reading' 'group work' and 'case studies' 'cohort 2 PD session materials' 'cohort 3 PD session materials'. This is a work in progress. With the new cohort 3 we have tried to make it easier for them to communicate with each other by prefixing their first name with C3 when they first register to join the community. This seems to be helping us as tutors identify specific groups within the community and target specific messages to specific groups or individuals in a clear and manageable way. We hope this will also help the teachers communicate more easily within the cohort 3. However, two teachers struggled with the registration process and now need to revisit their account and alter the presentation of their first name. The UK SAILS team is also encouraging teachers to upload a picture of their face so the 'feel' of the community become humanised and more appealing. The goal of the UK SAILS CoP is to create a place to share ideas and raise questions within a likeminded people in a ‘safe’ learning environment.

4 SAILS project conference

4.1 Rationale for Project Conference

Experienced IBSE teachers in all of the SAILS partner countries had been trialling SAILS inquiry and assessment resources in schools and it was felt by the consortium that it would be useful to bring these teachers together to share their experiences with each other and with the SAILS partners. A face-to-face meeting between teachers across the partner countries would also act to address the initial barriers teachers face in participating in an online Community of Practice (CoP) such as the SAILS International CoP. A proposal to run a SAILS teachers' conference in the SAILS participating countries was suggested at the SAILS Project Steering Committee on the 17th May 2013. With the agreement of the project officer, it was agreed that the conference would run in parallel with the DCU biennial conference, Science and Mathematics Education Conference (SMEC), on the 24-25th June 2014. The theme of this joint conference was "Thinking Assessment in Science & Mathematics" and was hosted by the Centre for the Advancement of Science and Mathematics Teaching and Learning, CASTeL, of Dublin City University. A further report on this conference has been presented as Milestone 34.

4.2 Conference Programme design

A key element of the conference was to provide a platform for teachers to share their experience with implementing inquiry and SAILS assessment strategies within their teaching practice. Teachers were invited to give a short presentation on their work with inquiry and assessment within classroom practice (CP) sessions. An open discussion was facilitated at the end of each session (3-4 teacher talks) which afforded opportunities for further discussions between teachers. The format of this conference is unique in that it brought together both practicing teachers and researchers in science and mathematics education. To promote these invaluable networking opportunities, two poster sessions were scheduled. The organisers also wanted to provide additional teacher professional development for the SAILS teachers. This aim was met through the six plenary talks by leading experts (including three talks by SAILS partners) in science and mathematics education research, the extended workshop sessions and the research (OR) parallel talks.

The conference programme is presented Table 2 below.

CONFERENCE PROGRAMME: TUESDAY 24TH JUNE 2014						
08:30	**Registration**					
09:00	**Welcome & Opening address** **Dr. Odilla Finlayson**, Coordinator of SAILS					
09:30	**Plenary 1: Professor Wynne Harlen, UK** , *Assessment in support of inquiry-based education*					
10:30	**Coffee Break**					
11:00	**Welcome & Launch** **Sean Sherlock TD** Minister of State, Department of Enterprise, Jobs & Innovation **Professor John Costello**, Dean of Faculty of Science and Health, Dublin City University					
11:30	**Plenary 2: Professor Beno Csapo,** *Defining an assessment of cognitive outcomes of inquiry based science education*					
12:30	**Lunch & Refreshments**					
13:45	**Parallel Sessions**					
	OR1	**OR2**	**OR3**	**WS1**	**WS2**	**WS3**
14:45	**Parallel Sessions**					
	OR4	**CP1**	**CP2**	**CP3**	**CP4**	
15:45	**Poster Session 1**					
16:45	**Plenary 3**: **Professor Malcolm Swan**, *Designing formative assessment in mathematics*					
17:45	**Wrap-up Day 1**					

CONFERENCE PROGRAMME: WEDNESDAY 25th JUNE 2014						
09:15	**Plenary 4**: **Professor Paul Black and Dr. Christine Harrison**, *Assessment in the Pedagogy of Inquiry*					
10:15	**Coffee Break**					
10:45	**Parallel Sessions**					
	OR5	**OR6**	**WS3**	**WS4**	**WS5**	**WS6**
11:45	**Plenary 5: Professor Cecília Galvão,** *Why teachers should want to follow our curriculum design*?					
12:45	Lunch & Refreshments					
14:00	**Parallel Sessions**					
	OR7	**OR8**	**CP5**	**CP6**	**CP7**	**WS2**
15:00	**Poster Session 2**					
16:00	**Plenary 6**: **Dr. Michael O'Leary and Dr. Zita Lysaght,** *Introducing the assessment for learning audit instrument: A tool developed to guide school based professional development*					
17:00	**Farewell & Closing** **Dr. Eilish McLoughlin**, Director CASTeL DCU					

TABLE 2 SAILS/SMEC CONFERENCE PROGRAMME

4.3 TEACHER PRESENTATIONS

SAILS project partners selected 68 secondary level science teachers and practitioners from across the 12 participating countries to participate in this conference. The number of participating teachers from each country is listed in table 3.

Country	Number of teachers
Belgium	5
Denmark	4
Germany	5
Greece	3
Hungary	6
Ireland	8
Poland	6
Portugal	6
Slovakia	7
Sweden	6
Turkey	5
United Kingdom	7

TABLE 3 PARTICIPATING TEACHERS AT SAILS CONFERENCE

Each teacher presented a poster and/or gave a short oral presentation on their experiences with implementing inquiry and associated assessment within their teaching practice. 23 second-level in-service teachers presented talks on their experience with implementing inquiry teaching and assessment within their own classrooms and 62 posters were presented. Titles of teacher oral and poster presentations are listed in Appendix I and II respectively.

These presentations provided SAILS partners with valuable insight into how SAILS units have been used in practice, challenges faced by teachers in implementing inquiry and associated assessment in the classroom, and also information on successful implementation of SAILS materials and how teachers had adapted SAILS materials to suit their own students' learning needs. The information gathered through these presentations will be used to further enrich SAILS teacher professional programmes and also to refine the SAILS draft units so that they can meet teachers' needs.

This element of the conference was very important as it gave teachers an opportunity for teachers to learn about good practices for IBSE from each other such as effective classroom management techniques, mechanisms for providing feedback and new teaching ideas – and these are key features of an effective CoP.

Slovakian teacher: *"Making new and interesting inquiry projects for my pupils with using various inquiry methods"*

German teacher: "*How inquiry based techniques can be introduced in school practice on basis of successful examples (Oral-presentations, Poster-presentations and Workshops)"*

Two poster presentation sessions were held to provide a networking platform for teacher-teacher and teacher-researcher exchanges.

All teachers' presentations and posters are available on the SAILS CoP and also on the conference website (www.dcu.ie/smec). This is a valuable bank of resources for teachers on the International CoP and will be further analysed by SAILS partners to review content for the SAILS draft units.

4.4 TEACHER PROFESSIONAL DEVELOPMENT

This conference offered participating teachers the unique opportunity to learn about assessment in the classroom with plenary presentations from renowned educators. The plenary speakers were Wynne Harlen (University of Bristol, UK), Paul Black with Christine Harrison (King's College London), Beno Csapo (University of Szeged), Cecília Galvão (Instituto de Educação da Universidade de Lisboa), Malcolm Swan (University of Nottingham) and Michael O'Leary with Zita Lysaght (St. Patrick's College, Drumcondra).

23 research presentations on the teaching, learning and assessment of mathematics, science and technology were made. Extended workshop sessions were also selected so that teachers could focus on particular areas that would help them implement an inquiry approach in their teaching. Workshops covered Assessing Inquiry in a Formative Fashion, Introduction to Video in the Science Classroom, Teacher-Student Dialogue in the Inquiry Classroom, and using ICT tools in the Inquiry Classroom. A workshop was also led by the UK teachers which demonstrated how group skills could be developed through inquiry and Scientix provided a workshop on the how the resources collected from this project could be used by teachers.

Teachers found that the conference provided them with useful information on formative assessment and how to implement various assessment techniques (rubrics and their design, self- and peer assessment, the use of video, providing appropriate feedback to students, discussing assessment criteria with students).

4.5 CONFERENCE OUTCOMES

The conference provided a valuable dissemination opportunity for the SAILS project across Europe to engage with other stakeholders, e.g. key actors in education in Ireland participated including representatives from the National Council for Curriculum and Assessment, Professional Development Services for Teachers and teacher educators. Several interviews were recorded with teachers on their presentations, their experience with inquiry and assessment, challenges with implementation and their recommendations for other teachers. These recordings will be made available on the project website and will be used as both an enhancement of the CoP and as a dissemination tool for the project.

Key outputs from the conference included further **professional development training** for the participating teachers. The poster sessions and classroom practice reports provided **networking** opportunities for teachers allowing teachers to share teaching and assessment strategies and removing the initial barriers teachers face in participating on an online CoP. The classroom reports and posters have been shared on the CoP which provides a **bank of materials** that teachers can use within their own teaching. These reports are also important resources for the SAILS partners as they provide **case studies** of teacher implementation of SAILS assessment materials. These case studies will be embedded within the SAILS units so that teachers can learn about how SAILS units can be used in a practical way and also to demonstrate the versatility of IBSE processes as they show that teachers can assess different aspects of their students' learning through the same inquiry lesson. Teacher reports included discussions of the challenges teachers faced in implementing an inquiry approach. These insights will also feed into the final development of SAILS **teacher education programmes** so that these provide appropriate support for teachers in implementing IBSE and assessment in their classrooms.

5 Conclusions

A CoP has been established in each participating country in the SAILS project since month 10 (October 2012).

The use of the CoPs so far has been limited, underlined by the following observations:

- **Membership**. The rate of growth of membership is slow but we can see increases in membership after teacher training events;
- **Discussions**. To date there have been relatively few discussions within any of the CoPs and these discussions are typically only contributed by CoP team members and little by practitioners.
- **Resources**. The amount of resources at the end of 2013 was low but 2014 saw an increase in the number of resources in a number of the CoPs. The key question is whether there a critical mass of resources in any of the CoPs.

When looking at individual countries we can see that there are many CoPs in operation some facilitated by SAILS and some outsides of SAILS. Many are using emails to communicate with each other. The CoP discussing and sharing resources with a community composed of recipients in a group mail.

SAILS can be seen as supporting many forms of CoPs in participating countries as it provides a forum for teachers to come together to discuss IBSE as a common domain of interest with the objective of developing a shared practice. In particular WP4 builds communities around IBSE through teacher training. A large number of SAILS run IBSE workshops have now taken place in the SAILS participating countries. These workshops seed CoPs in particular counties whereby teachers meet to discuss and develop IBSE. These communities can live beyond the lifetime of the workshops where teachers at the workshop keep in contact, for example through email or subsequent workshops. Hosting a physical meeting of the CoP in the form of a conference offered a unique opportunity for exchange between communities that supported the online CoP.

However, facilitating a CoP is a challenging endeavor, especially one with a limited lifetime such as one tied to the project. Key challenges for moderators include (Tarmizi, de Vreede, & Zigurs, 2006):

- Encouraging new members to participate in community activities
- Promoting ownership and encouraging group responsibility
- Creating comfort with and promoting understanding of the tools and tool outputs

This has been very much the experience of the SAILS CoP facilitators.

The key question at this point is whether the CoP in its current form is fit for purpose. With one year left in the project we must also consider a sustainable model for the CoP. Teachers are using other mechanisms for facilitating CoP activities. These mechanisms in general have been there before the SAILS project began and will be there when the SAILS project concludes. These CoPs are specific to individual countries as how groups of individuals come together to discuss a common concern is culture specific.

From this learning the SAILS team is looking at how to utilize the existing CoPs in each participating country instead of forcing a CoP mechanism on participants. This will be looked at in the first half of 2015. We hope to launch a more sustainable model by June 2015 so that there is time to seed any new approaches to the CoP before the close of the project. We will document our approach in D5.6 Plan for the Continuation of Community of Practice due in Month 46.

6 Bibliography

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Appendix I: Teacher oral presentations

#	Authors	Country	Contribution Title
1	Ana Vicêncio	Portugal	Biotechnology, millions that can generate billions: Teacher perspective on students' assessment
2	Declan Cathcart	Ireland	Towards an assessment of an inquiry module on the living conditions of woodlice
3	Monika Antušová, Ivana Slepáková and Katarína Kimáková	Slovakia	Assessment of selected biological activity based on inquiry at lower secondary
4	Danny Van der Veken	Belgium	Introducing stem education in secondary schools: some ideas. Kogeka's story
5	Carla Matoso	Portugal	Black tide – Oil in the water: Teacher perspective on students' assessment
6	Joachim Gretsch and Nadine Reddersen	Germany	How to improve the image of a camera obscura – an inquiry-based approach from the middle school optics curriculum
7	Lisbeth Vive	Denmark	Egg collision and the bottle contains
8	Dorota Černíková and Zuzana Ješková	Slovakia	Experience with inquiry activities and their assessment at a lower secondary school in Slovakia
9	Aikaterini Kasimatis *et al.*	Greece	Using Moodle and e-assessment methods during a collaborative inquiry learning scenario
10	Karin Marianne Lilius	Denmark	Inquiry based science education in the joint science exam in Denmark
11	Maria Ganajova and Milena Kristofova	Slovakia	Assessment of selected aspects of inquiry during teaching topic properties of plastics
12	Brigid Corrigan	Ireland	Inquiry assessment in the chemistry classroom – fundatory experiments made relevant
13	Derya Yahsi	Turkey	Teachers' reflection on IBSE
14	Michael A. Wunder	Germany	Formative assessment while pupils study circular motion
15	Slavka Ropekova and Marian Kires	Slovakia	The role of inquiry activities in physics education at lower secondary school
16	Vanessa de Andrade	Portugal	Assessing planning skills when students are involved in the inquiry activity "Up there… how is it?"
17	Aine Woods	Ireland	Using model based inquiry to teach atmospheric pressure
18	Elaine Doyle	Ireland	"That's mad! There's More Calories in Nutella than Crisps": Using Inquiry to Teach Nutrition to Disadvantaged Students
19	Stine Caspersen and Morten Rask	Denmark	"Young Scientists" through IBSE
20	Miroslaw Brozis	Poland	IBSE on math lesson - is it possible?
21	Ulrich Dahl	Denmark	ISI 2015 (Innovation, Science, Integration)
22	Ourania Petropoulou *et al.*	Greece	Inquiry based learning in primary education: a case study using mobile digital science lab
23	Teresa Loureiro	Portugal	Goats and human, resources and sustainability: Teacher perspective on students' assessment
24	Enda Carr	Ireland	The Particulate Nature of Matter, Inquiry Based Learning and the Transformative Education of Junior Secondary School Students
25	Richard Moynihan	Ireland	The application of tutorial based worksheets to enhance student understanding of static electricity and magnetism at lower and upper second level education

Appendix II: Teacher poster presentations

A selection of teachers' posters and titles is presented below. Additional posters were also presented during the conference.

	AUTHORS	Country	CONTRIBUTION TITLE
1	Luísa Encarnação	Portugal	Bacteria from Mars in Alentejo: Teacher perspective on students' assessment
2	Dulce Campos	Portugal	Speed Activity: Teacher's perspective about student´s assessment
3	Beáta Kirešová, Eva Vysopalová,Katarína Kullová and Marian Kires	Slovakia	Science in action – school inquiry project
4	Beata Sobocińska	Poland	'woodlice' unit – application and assessment at the lower secondary school level in erspe
5	Anna Levin	Sweden	In my classroom
6	Christina Karlsson and Anna Falkstedt Svensson	Sweden	Why do we use road salt in winter time? How does the salt affect our vehicles?
7	Ed Mclaughline and Ed Carew-Robinson	UK	Implementing an inquiry based approach into our school
8	Matylda Dudzinska, Gabriele Hoffmann and Fredericke Langmaak	Germany	The embedding of IBSE-Units into german physics curriculum
9	Ismail Donmez	Turkey	A case study on "candle" activity
10	Funda Atak	Turkey	A case study on "speed" activity
11	Tilman Kant and Alexander Gehring	Germany	A learning cycle to foster inquiry skills
12	Rüdiger Weiß	Germany	Circular motion – a problem based IBSE approach
13	Katalin Kopasz, Károly Tóth and Imre Csiszár	Hungary	Computer-based experiments as IBL-exercises
14	Ágota Somogyi and Csaba Csíkos	Hungary	Free Falling Eggs Reaching Different Types of Ground
15	Attila Pásztor and Benő Csapó	Hungary	Improving Combinatorial Reasoning through Inquiry-Based Science Learning
16	Tünde Kontai and Lászlóné Nagy Erzsébet Nagy	Hungary	Is yeast alive? The experiences of testing an inquiry task
17	Imre Csiszár and Szilveszter Szélpál	Hungary	Scientific Student Laboratory – Where You Will Get to Like Science
18	Zsuzsa Oláhné Nádasdi, Géza Barta and Erzsébet Korom	Hungary	Studying the Decomposition of Starch in Saliva
19	Ana Vicêncio	Portugal	Biotechnology, millions that can generate billions: Teacher perspective on students' assessment
20	Kupčíková Vlasta, and Ješková Zuzana	Slovakia	Guided inquiry activities on motion supported by digital technologies
21	Aikaterini Kasimatis, Ourania Petropoulou, Symeon Retalis, Ioannis Dimopoulos, Yannis Psaromiligkos and Konstantinos Karaggelis	Greece	Using moodle and e-assessment methods during a collaborative inquiry learning scenario
22	Vanessa de Andrade	Portugal	Assessing planning skills when students are involved in the inquiry activity "Up there… how is it?"

23	Teresa Loureiro	Portugal	Goats and human, resources and sustainability: Teacher perspective on students' assessment
24	Carla Matoso	Portugal	Black tide – Oil in the water: Teacher perspective on students' assessment
25	Katalin Radnóti, Mária Nagy and Mária B. Németh	Hungary	Studying the temperature dependence of the speed of chemical reactions
26	Ourania Petropoulou, Symeon Retalis, Ioannis Psaromiligkos, George Stefanidis and Spyidoula Loi	Greece	Inquiry based learning in primary education: a case study using mobile digital science lab
27	Gábor Veres and Erzsébet Korom	Hungary	The Test of the Pudding
28	Dorota Černíková and Zuzana Ješková	Sloca	Experience with inquiry activities and their assessment at a lower secondary school in Slovakia
29	Slavka Ropekova and Marian Kires	Slovakia	The role of inquiry activities in physics education at lower secondary school
30	Joachim Gretsch and Nadine Reddersen	Germany	How to improve the image of a camera obscura – an inquiry-based approach from the middle school optics curriculum.
31	Michael A. Wunder	Germany	Formative assessment while pupils study circular motion
32	Erzsébet Korom, Mária B. Németh and Lászlóné Nagy Erzsébet Antal	Hungary	The Diagnostic Assessment of Scientific Literacy
33	Bea Veulemans & Carine Vallons	Belgium	Learning path of implementing inquiry based teaching and its assessment in a science teacher team
34	Zuzana Mackovjaková and Zuzana Jeskova	Slovakia	Using interactive demonstrations at Slovak secondary schools
35	Małgorzata Chmurska	Poland	IBSE assessment at the upper secondary school level – report on application of 'household vs. Natural environment' unit
36	Klaudia Ciura and Joanna Duch	Poland	Sugars – IBSE project for upper secondary school level
37	Monika Jurek	Poland	Locating the centre of gravity – application of ibse in sociotherapy process
38	Beata Sobocińska	Poland	Natural selection – using lego® creatures at the lower secondary school level in Poland
39	Anna Persson, Alexandra Andersson and Björn Forsberg	Sweden	If you keep your mobile phone in your pocket does the ability to get children decrease?
40	Mirosław Brozis	Poland	IBL in maths lesson – is it possible?
41	Ali Akinci	Turkey	IBSE in the Turkish Science Classroom
42	Larissa Greinert, Maximilian Barth and Gunnar Friege	Germany	"Traffic light cups" – a formative assessment tool
43	Karden Onsoz	Turkey	Use of mobile technologies in science teaching
44	Brigid Corrigan	Ireland	Inquiry assessment in the chemistry classroom - fundatory experiments made relevant