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INSTEM 7th Newsletter

DISSEMINATION OF INNOVATIVE WAYS OF TEACHING AND LEARNING

In this newsletter we would like to give you an insight in strategies that have been proven successful to disseminate innovative ways of teaching and learning.

First, we will give an overview of the effective dissemination strategies of the Instem project in full range and variety.

In addition, we will provide a snapshot of the successful activities that took place in the Instem partner countries Turkey as well as Romania. Afterwards, a special way of dissemination will be presented: an example about an in-house trade fair of a vocational school in Germany - inquiry-based at its best!

Last but not least we would like to inform you about how the Instem project will go on after the project's end.

We hope you enjoy reading this last Instem newsletter – thank you for your loyal readership during the project's lifetime.

Katja Maaß & the Instem consortium

Education and Culture DG
Lifelong Learning Programme

THE DISSEMINATION STRATEGY OF INSTEM

Dissemination refers to "the process by which, using certain strategies, results of a project are made available, comprehensible and usable by potential users" (Debry et al. 2013). Disseminating materials and ensuring their use is a core aspect of the INSTEM project. Working towards this is embedded from the outset, both with respect to short term opportunities as well as to strategically planning long-term dissemination and exploitation. The activities carried out to disseminate and exploit INSTEM project results and knowledge are either web-based, paper-based or face-to face strategies.

Setting up sustainable structures

A crucial point for the project has been the setting up of sustainable structures, which allow continuation of the work after the lifetime of the project on a national and/or international level. This was a major challenge, which INSTEM tried to meet amongst others by supporting partners to establish national working groups. The INSTEM model behind these working groups is to establish groups in each country to develop strategies for sustainable exploitation of synthesized project results. These reference groups are composed of teachers and representatives of stakeholder organisations including teacher educators, science education researchers, curriculum developers, quality assurance, industry and educational governance communities. These groups have been working together at a national level and will go on in doing so.

Instem dissemination plan

Who disseminates?
- Project leaders
- Teacher trainers
- Researchers

What is disseminated?
- Reports about IBL
- Reports about project outcomes
- Conference outcomes
- Newsletters
- INSTEM wiki
- Case studies

How are the results disseminated?
- Text-based dissemination (leaflets, poster, international and national INSTEM, website etc.)
- Speeches at conferences, meetings etc.
- Workshops

To whom are the results disseminated?
- Practitioners
- Researchers
- Policy makers
- Interested public
- Existing networks

What Instem has achieved

A number of strategies have been used in order to maximize the impact of the project outcomes.

STRATEGY ONE: CONFERENCES

As part of the dissemination process three conferences were carried out. These conferences were held with key actors in science education and mathematics education. These key actors included representatives from the partner country's ministries of education, mathematics and science national learning centres, school boards, educational authorities, teacher centres, science and mathematics teachers, science and mathematics educators and researchers. The conferences attracted a total of 182 key actors.

The conferences were a ground breaking step for identifying, extracting and synthesising the learning from previous EC funded projects. Conference partners and participants shared their understanding of inquiry-based learning and discussed meaningful dissemination and implementation strategies. The conferences contributed promoting European co-operation amongst different stakeholders, especially amongst the national workgroups. The conferences also helped to spread INSTEM results to a broader community, in particular also to countries not involved in Instem: Connections to important stakeholders across Europe have been established.

STRATEGY TWO: TALKS AT OTHER CONFERENCES AND WORKSHOPS

Research and teacher conferences and workshops were important means for the project's dissemination actions. From the beginning, the project's outcomes, theoretical perspectives and a comparative analysis about project knowledge as well as of the current state of the art of learning and teaching in the participating countries have been disseminated and presented in a number of workshops, conferences and other events.
Altogether, more than 75 talks at conferences and workshops have been given, which addressed teachers, academics and further key-actors.

DISSEMINATION IN TURKEY

Excerpt of dissemination events supported by the Turkish partners

National workshop
Ankara, Turkey, October 22, 2013
Target group: Policy makers, researchers, teachers and SME representatives
Topic: Teacher professional development programmes including reflective practice components, organized by the Haceteppe University

Talk at a conference
IOSTE Eurasia Regional Symposium & and Brokerage Event Horizon 2020, 24-26 April 2015, Istanbul, Turkey
Target group: educators, teachers, researchers, and policy makers
Contribution: Presentation of the Instem project and four presentations at the symposium by several Instem partners.

National Event
Science Camp, July 2015, Ankara, Turkey & August 2015, Halle, Germany,
Target group: 14-16 years old students
Topic: students could participate in the science camp of another country. During these science camps, many activities on IBSE were carried out with the students.

Conference
Stem & makers fest/expo Turkey 2015 & 1st Stem teacher conference, 7-8 September 2015, Ankara, Turkey
Target group: around 2000 participants: students, teachers
Topic: IBSE activities. Many EU-funded projects and national project were presented in a workshop. Teachers also presented best practices in a poster session.

STRATEGY THREE: NATIONAL AND INTERNATIONAL WEBSITE & WIKI

An appealing website (http://instem.tibs.at) was set up to inform and attract different target groups. The INSTEM website was created in order to facilitate collaboration among partners and projects as well as to initiate the flow of information and resources etc. involved. Therefore, national websites were set up as well.

The international website aims to bundle project outcomes and maintain these results for the future, and to provide information in all seven languages of the partner countries.
On the international website a wiki was implemented which can be easily updated during and after the project (sustainability).

STRATEGY FOUR: NATIONAL WORKSHOPS

In November and December 2013 as well as in January 2014 in each partnership country workshops on a national or regional level were successful organised. 483 participants from different backgrounds – policy makers, key-actors, project coordinators, teacher educators and teachers as well as pupils – were brought together to initiate national processes. These national workshops were ground-breaking as they brought together many different key-actors from different background and were successful in establishing long lasting cooperation between these stakeholders.

STRATEGY FIVE: REPORTS

(A) *Structured summarizing report about project knowledge*
A major aim of INSTEM was to gather and collate knowledge, experience and products around inquiry-based teaching produced in recent Comenius projects, networks and FP7 projects into a single synthesis document, available online and in print.
This report has stimulated the work in the national working groups tremendously. The report provides information on a meta-level condensed into recommendations for the EU policy as well as for the national policy. The report was disseminated continuously via all national and international activities, face-to-face meetings and in particular on 20+ major events, for instance ECER 2013 (Istanbul), EC gender workshop (Brussels), Scientix 2 launch meeting (Brussels), Creative Little Scientists Conference (Athens) as well as the conference on Educating the Educators-international approaches to scaling-up professional development in maths and science education (Essen).

(B) *Analysis of the current state of the art (INSTEM state of the art report)*
One of the major achievements of the first 9 months was a state-of-the-art report based on an analysis of EC funded inquiry-based learning (IBSE) educational innovation including inquiry-based teaching, gender issues, science career information and on the exploitation of project knowledge beyond the lifetime of projects across the partnership nations. This state-of-the-art itself allowed us to contact important target groups and stakeholders from the very beginning as its content was attractive for them and in consequence was a good starting point for our communication within large networks.

DISSEMINATION IN ROMANIA

Excerpt of dissemination events supported by the Romania partners

Talk at a conference
***New Perspectives in Science Education*, 20-21. March 2015, Florence, Italy**
Target group: academics, researchers, teachers, experts and practitioners
Contribution: Presentation about "The follow up of the Fibonacci project, a case study" highlighted the analysis made for the INSTEM project concerning impact and showed new insights into the project and its results.

***6th International Conference Science Education in School*, 3-4 April, 2015,** Galati, Romania
Target group: inspectors, primary and middle school teachers and school students
Contribution: Presentation about "Educational projects run by the Center for Science Education and Training: INSTEM, SUSTAIN, SCINET, CEYS". This opportunity to meet a large audience to whom these projects are addressed offered the possibility to recruit new "end-users" and national partners.

Poster contributions
12th International Conference on Hands-on Science (HSCI2015), 27- 30 July 2015, Madeira Island, Portugal
Target groups: all people involved in science education, aimed at promoting a broad exchange of experiences on good practices of science teaching and learning related to science education and its development.
Contribution: Poster entitled "Lessons learned from the INSTEM project", describing the INSTEM project, its goals and strategies.

Promoting the national and international Instem websites
Over 1600 emails have been sent out to different target groups in Romania. Aim was to invite them to visit the project website, to provide information about the Instem project and the project reports.
This action proved to be very fruitful as by the end of September 2015 the number of visitors at the Romanian national website reached 1715.

The report was sent to 88 policy making related people and organisations on an international level. Dissemination also took place through PROCONET, the IOSTE Conference and brokerage event, the INSTEM national workshops (483 participants), NEON and the SiS Catalyst Platform. It was also distributed among the INSTEM network which consist of 11 Universities, 3 schools and 56 associated partners. The outstanding quality of the report is also shown by the fact that it was quoted in the new European Commission's report on Science education "Science education for Responsible Citizenship" (Hazelkorn et al. 2015).

STRATEGY SIX: USING EXISTING NETWORKS

The conferences and personal contacts outlined above got the key-actors involved. The INSTEM network consists of 11 Universities, 3 schools and 56 associated partners. They, in turn, not only went on to spread the materials as individuals, but also were and are able to further increase dissemination through use of the networks to which they belong, such as teachers' associations etc.. The partners of Instem and their associated partners profit from a rich mutual exchange and all contributed to their shared aim of a widespread implementation of innovative approaches in STEM education.

STRATEGY SEVEN: PUBLICATIONS

A major focus which was successfully achieved was on publishing our activities and outcomes on either websites or in journals. Therefore all project' findings and results are available on the project website as well as linked to the Scientix project database.
Further on, to name but a few the two publications "The follow up of the Fibonacci project, a case study" and "Lessons learned from the INSTEM project" based on the Instem results already appeared. Several additional publications are planned for the year 2016.

STRATEGY EIGHT: NATIONAL WORKSHOPS AND CASE STUDIES

On a national level, the most important keys to dissemination are the national working groups. Project partners have been engaged in setting up sustainable national dissemination structures via the national working groups. Each partnership country also wrote a case study on how the project knowledge is exploited its country (description, analysis of effects, focusing on the national impact and the potential for the basis for replicability to other country/regions). These case studies were collected and collated on an international level. Presented on the homepage they support other stakeholders interested in setting up sustainable national dissemination structures.

With the dissemination activities carried out so far Instem has reached more than 10.000 people. We have reached further teachers, researchers and other key-actors with leaflets, the homepage and other events. In total, the dissemination of the project is very successful and the activities carried out were on an impressive high quality level. As the Instem structures will continue to exist after the end of the project, the dissemination will go on.

A special way to disseminate – an example

INQUIRY-BASED LEARNING AT ITS BEST – AN IN-HOUSE TRADE FAIR OF A VOCATIONAL SCHOOL

Here we want to inform about another interesting means for dissemination of innovative ways of teaching and learning: A students' in-house trade fair carried out by a vocational school, the Walther-Rathenau-Gewerbeschule in Freiburg, Germany, in cooperation with the European project Mascil.

Many students are wondering what they can do after they finished school. - What are possible options? Apprenticeship? College? University? One offer to learn about different careers is an in-house trade fair like the Walther-Rathenau-Gewerbeschule organised it. At such an in-house trade fair school graduates get insight in careers in electrical engineering, information technology, pharmaceutical technician and chemical technician. Here, they receive answers to questions like: How will an apprenticeship look like? What contents will be dealt with?

What is really special about the in-house trade fair is the way it is organized: it is not the teachers or companies who prepare the exhibition, but the students themselves. They develop their own presentations and projects about possible careers and present them on their stands. Illustrative materials and hands-on experiments give visitors an authentic insight into the different careers. In 2015 the focus was on network engineering: Sending emails, server virtualization, monitoring technology are only some examples of topics which are discussed currently in business. The booths presented students results of their own inquiry-based learning in relation to security and eavesdropping of voice over internet, construction of a radio link, enlarging of a communication system within a building, construction of an intruder alarm system and development of a programmable robot's arm.

The fair attracted around 200 visitors: Interested students of general education schools but also parents and instructors from different enterprises which created a win-win situation for both exhibitors and visitors. Visitors enjoyed the exhibitions and exhibiting students particularly enjoyed the fruitful discussions with the visitors.

As the in-house trade fair was a big success the Walther-Rathenau-Gewerbeschule will run the trade fair annually and by this continue promoting inquiry-based learning of their students.

HOW INSTEM WILL GO ON AFTER THE END OF THE PROJECT

The project Instem brought together key-actors in Science education all involved in several European projects and all of them very well connected to key-actors in practice and policy. These exchange between different European projects never happened before and will have a long lasting impact on the cooperation which has been initiated through Instem. Our networking activities, our connections will continue to support the implementation of innovation in STEM education.

INSTEM is sustainable because for the first time, a meta-level overview of previous activity in STEM projects is available. This should help in the design of future projects and the planning of calls and work programmes. This overview highlights basic principles, challenges and solutions, especially regarding inquiry-based learning, and therefore complements the specific results of individual projects.

INSTEM is also sustainable because it shows that meta-level overviews can be developed and updated at relatively low cost. INSTEM thus demonstrates the feasibility of a long-term mechanism or structure for monitoring, collating and building upon project activities. In particular

- By our final synthesis report collating knowledge of a large number of projects, which will be available after the end of the project through a maintained website and Wiki, to which future projects can add their knowledge;
- By our state-of-the-art report describing case studies and analysing possibilities for enabling national working groups to make use of the synthesized project knowledge so as to ensure the widest possible exploitation in and beyond partnership countries. The case studies offer excellent insight in how innovations in STEM education can be supported.

This work of INSTEM enabled partners and other academics (beyond the consortium) to build on this knowledge in their future work.

We also have embedded innovative teaching practices in the work of teachers through the national working groups, potentially reinforced by future local projects. Their work as inspired by Instem will continue.

We also liased with national work groups and encouraged them to continue their work driven by their joint enterprise to implement educational innovation after the end of INSTEM.

Summing up, we having established will go on to continuously enlarge a network of networks which will be used for dissemination processes during and after the end of INSTEM, in particular for the meta-level overviews and reports as described above.

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