

Work package 3 Powerful educational environments for successful science teaching

News about WP3 activities - Matthias has a provisional [timeline](#) available here.

Description of work

Work package 3 will be led by the Leibniz Institute for Science Education at the University of Kiel (IPN) with participation from all national liaison partners, who will evaluate "SINUS modules" with their respective teacher education institutions. For the SINUS programme, IPN has developed 11 modules for science teacher professional development that have been used in networks of teachers from 1800 schools in Germany. IPN also has access to science teaching approaches from the large scale programmes "Biology in Context", "Chemistry in Context" and "Physics in Context". SINUS thus enables teachers to be supported in collaboratively reflecting upon, developing and evaluating their own instruction using the modules, guidelines, experience from SINUS and other programmes as a basis for further development. A useful presentation about SINUS can be found [here](#) and here is a useful [journal article about SINUS](#). A detailed description of the SINUS modules and how teachers used them for developing their instruction can be found [here](#).

1. Background

The sustainable impact of problem-based and inquiry-based science teaching techniques depends on various aspects of science learning environments within schools. Teachers trying to systematically foster the development of scientific understanding and literacy need to know the basic principles of powerful learning environments. In particular, they have to take into account the recent challenges or problem areas of science teaching that have been identified in large scale assessments like TIMSS or PISA, and which have also been observed in video studies. Drawing on these research findings, IPN has elaborated 11 modules for science teacher professional development that have been used in networks of teachers from 1800 schools. The modules focus on e.g. the use of experiments, argumentation and communication in science instruction, cooperation of students, and students' autonomy and responsibility for their learning.

2. Outcomes

The training packages (14 will be produced) will be designed to promote co-operation between teachers in order to implement innovative approaches at school level. Teachers will be supported to reflect upon, develop and evaluate their own instruction. The training units, which can be combined with packages from other WPs, enables teachers to design learning environments that focus on students' learning and develop their interest in science and technology.

3. Pilot studies and evidence

The training packages of WP3 are based on products, experiences and outcomes of large scale approaches to implementing and disseminating innovative science teaching approaches in schools in the well known SINUS and SINUS-transfer programs, been designed and coordinated by IPN (Principal Investigator: Manfred Prenzel). Additionally, we can draw on evidence from other programs led by IPN showing the importance of meaningful contexts for science teaching. All approaches are well accepted by teachers and systematic evaluation indicates evidence for effects on students, teachers and schools.

4. Outline of activity / material

The training packages will be used by groups of teachers, ideally comprising all the science teachers from a particular school. Exchanging and sharing results between teacher groups from neighboring schools will add to the implementation of innovative methods. The training packages provide background knowledge of the particular topic to allow the teachers a common understanding of the problem to be tackled. An input on a new teaching approach or teaching example is followed by small-group work to develop a lesson plan. The teachers try out the plans and present their experiences with the new material in the following session and discuss them for further development. The teacher groups should meet on a regular basis (e.g. once a month) over a period of at least one year in order to develop routines with the new approach and to implement quality development at their school. Reports on WP3 activities The report will sum up the results of the workshops (relevant problem areas, possible starting points for disseminating quality in science teacher education) and activities in the partner countries to implement principles of science education mentioned in the call. The report will be delivered in two parts: one in M9 with a description of the respective situations in the countries and first steps to implement quality science education and a second towards the end of the project (M33) with a closer look at activities and outcomes.

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Product	Date started	date completion	comments
3.1 National Workshops for quality development in science education	M1	M6	Sinus presentations already made in Trondheim and Lyon
3.2 Training packages x 14 for teacher education institutions	M12	M30	
3.3 Web based access and feedback system	M12	M36	
3.4 Preliminary report on results of workshops	M6	M9	
3.5 Final report on SINUS-based activities and outcomes	M30	M33	

Timetable for activities in WP3 in the first year of S-TEAM

Activity	start date	end date	comments
set up WPC	2009-05-10	2009-06-30	joint WPC with WP2; members: Doris, Manfred, Jens, Gultekin (Sibel is interested but has not yet confirmed)
WPC meetings			meetings will be scheduled together with other project meetings as possible (ESERA 2009, International policy workshop 2010); members will get written information about progress in advance
scheduling of national workshops	2009-05-08	2009-08-15	combined workshops with WP2; scheduling with NLPs
inviting NLPs to organise workshops	2009-06-15		e-mail with aims and target groups, preliminary outline of workshop activities;
timetable with dates of national workshops on S-TEAM homepage			
national workshops	2009-06-30	2009-10-31	should be run mainly in September and October 2009; already fixed for Lithuania, Israel and France (see timetable)
preliminary report on workshops	2009-11-01	2010-01-31	
development of training packages	following workshops	2011-10-31	depending on particular situations and prevailing problems
online platform for exchange and feedback	2009-11-01	2010-4-30	preparation of an online platform: access to training packages and feedback on SINUS activities; choosing communication tools