

PSNPP Annual meeting 2007

MOSEM Project

**Teacher training of pupil-active learning
in superconductivity and electromagnetism
with minds-on simple experiments**

Vegard Engstrøm, Simplicatus AS
Leopold Mathelitsch, University of Graz
Wim Peeters, University of Antwerpen
Francisco Esquembre, University of Murcia

Marisa Michelini, University of Udine
Grzegorz Karwasz, University of Torun
Carmen Holotescu, Pol. Univ. of Timisoara
Gren Ireson, University of Nottingham Trent

2001-2004

SUPERCOMET Project

SUPERCOnductivity Multimedia Educational Tool

Teacher seminar

First version in 4 languages, UK, NO, IT, SI

Computer application

1st & 2nd version in 4 languages, UK, NO, IT, SI

Second version with 5 modules:

Magnetism, Electromagnetic induction

Electrical conduction

Introduction to superconductivity

History of superconductivity

Teacher guide

First version in 4 languages, UK, NO, IT, SI

Some teaching activities, physics curriculum

Classroom poster

Nobel Prizes, History of superconductivity

Intranet

Project management tool used by partners

www.supercomet.no

Website for communicating project results

2004-2007

SUPERCOMET 2 Project

SUPERCOnductivity Multimedia Educational Tool 2

Teacher seminar

Expanded to 4 half-day modules in English
Will be translated to 14 languages

Computer application

Reimplemented with new online platform
Flash 7→9, corrections, design improvements
3 new modules: Superconducting materials
Explanation & Applications of superconductivity

Teacher guide

Updated and expanded version in English
Will be translated to 14 languages
More activities, modelling, assessment

Minds-on kits

Tried out activities, materials → MOSEM project

Online community

Prototype framework online → Physible project

Simulations

Prototype EJS model → Simulation project(s)

2007-2009

MOSEM Project

Minds-On experimental equipment kits in Superconductivity and Electromagnetism for the continuing vocational training of upper secondary school physics teachers

Teacher seminar

Will adapt to Minds-On experiments

Computer application

Possibly update some animations

Teacher guide

Will expand with Minds-on experiments

Minds-on kits

Produce and distribute prototypes
Conduct trials with pupils in schools
Disseminate project results (PSNPP and others)
Collaboration with local authorities

2007-2009

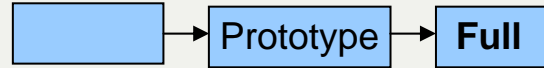
MOSEM Partners, Poland

ASC-TCH	Polskie Stowarzyszenie Nauczycieli Przedmiotów Przyrodniczych (PSNPP)
EDU-UNIV	Uniwersytet Mikołaja Kopernika (UMK)
EDU-UNIV	Uniwersytet Wrocławski
EDU-VET	Akademia Pomorska, Słupsk
EDU-VET	Centrum Kształcenia Ustawicznego w Gdansk (CKU)
EDU-VET	Liceum Ogólnokształcące nr 8, Torun
ENT-SME	Soliton
PUB-REG	Urząd Miasta Sopot, Wydział Oświaty

Projects

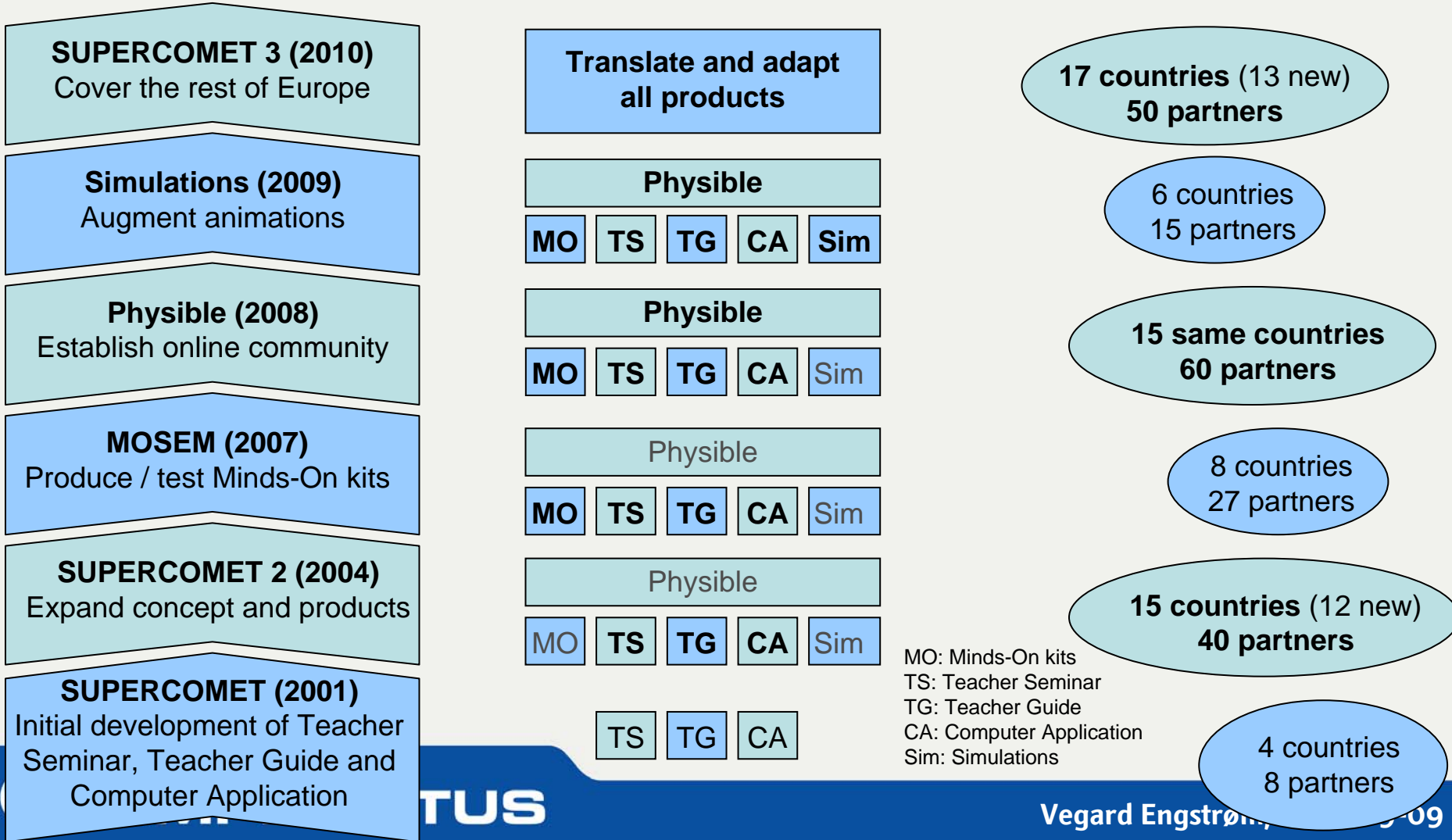
2 PP → 3 Tol (products)
→ 1 Tol (geographical)

Products



Footprint

SUPERCOMET 3 covers all European countries not previously covered



Examples of developed materials

Teacher seminar	Several source files, e.g. on teaching methods Demo 2 April at Science on Stage 2 , Grenoble Demo 9 September at Annual Meeting of Polish Association of Science Teachers, Torun
Computer application	First version 2002 , Second version 2005 Third version October 2007, New animations
Teacher guide	Printed edition March 2005 New electronic version (draft) July 2007
Minds-on exper. kits	MOSEM prototypes expected November 2008
www.physible.eu	Online community prototype 2005
www.supercomet.eu	Project website with more information
Simulations	Prototype EJS model by Fransisco Esquembre

Testing in upper secondary schools

SUPERCOMET version

2004 Teacher Seminar, Teacher Guide and Computer Application

- Formative expert review of English version (e-modules) spring 2005
- Translations in 2005 and 2006, Testing in 2006 and 2007
 - Formative, summative (e-modules with animations, support materials),
 - Illustrative (teacher seminars and classroom trials)
- Italian partners led by the U. of Udine: Trials with ~350 students
 - 3 approaches, 2 research oriented; action research, teaching-learning
 - Presentation in session 1.4 by Rossana Viola (Ph.D. thesis)

SUPERCOMET 2 version

2007 Teacher Seminar, Teacher Guide and Computer Application

- Completed and translated by November 2007
- Pilot use/further trials in 2008 by SUPERCOMET 2 and MOSEM partners

Testing to be continued in the MOSEM project in 2007-2008

Publications / references

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[G. Ireson \(2006\)](#), Measuring the transition temperature of a superconductor in a pre-university laboratory, *Phys. Educ.* **41** pp. 556-559

[B. Schorn et.al. \(2006\)](#), SUPERCOMET 2 – Modelling superconductivity, GIREP Conference 2006, Amsterdam

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[G. Karwasz et.al. \(2005\)](#), Hands on experiments on magnetism and superconductivity, GIREP Workshop 2005, Ljubljana

[A. Earle et.al. \(2005\)](#), SUPERCOMET Teacher Guide, Simplicatus, Trondheim
ISBN 82-8130-045-0

[V. Engstrøm et.al. \(2004\)](#), The SUPERCOMET Project – animating electricity and magnetism for upper secondary school, GIREP Conference 2004, Ostrava

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