

# Informatics4All

Michael E. Caspersen

Aarhus University / It-vest

A large, abstract network graphic in the bottom right corner, consisting of numerous small orange dots connected by thin white lines, forming a complex, interconnected web.

# WG on Informatics Education: CECE

- **Members of the Committee on European Computing Education**

- Jan Vahrenhold, University of Münster, Germany
- Enrico Nardelli, University of Rome "Tor Vergata", Italy
- Cristina Pereira, Informatics Europe, Switzerland
- Gérard Berry, Collège de France, France
- Judith Gal-Ezer, The Open University of Israel, Israel
- Michael Kölling, King's College London, United Kingdom
- Andrew McGettrick, University of Strathclyde, United Kingdom
- Mirko Westermeier, University of Münster, Germany
- Michael E. Caspersen, Aarhus University / It-vest, Denmark
  
- Barbara Demo, University of Turin, Italy
- Serdar Tasiran, Koc University, Istanbul, Turkey
- Antoine Petit, INRIA, France

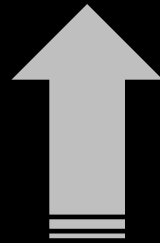


# WG on Informatics Education: I4All

- **Members of the Informatics for All group**
  - Enrico Nardelli, University of Rome "Tor Vergata", Italy
  - Judith Gal-Ezer, The Open University of Israel, Israel
  - Andrew McGettrick, University of Strathclyde, United Kingdom
  - Wendy Hall, University of Southampton, United Kingdom
  - Bobby Schnabel, ACM
  - Michael E. Caspersen, Aarhus University / It-vest, Denmark



# IT as Knowledge Area: Informatics and CT



IT as a Supporting Technology

# Digital Competences in the 21<sup>st</sup> Century

## Knowledge area

As subject  
In subjects

### Informatics/Computational Thinking

Advanced  
(‘for some’, ‘for career’, in-depth)

Fundamental  
(‘for all’, ‘for life’, general ‘bildung’)

As radical, novel, and defining  
technology and way of working  
(innovation of subjects)

As subject  
(specialisation)

In subjects  
(integration)

## Support

Technological, practical,  
pedagogical, and  
subject-specific

As subject-specific tool/media

Subject-specific

E-learning and collaborative tools

Pedagogical

Digital literacy (“ECDL”) – literate *consumer* of IT

Practical

Technology and infrastructure

Technological

# Two Challenges for our Community

**To clarify and set direction**  
(outward)

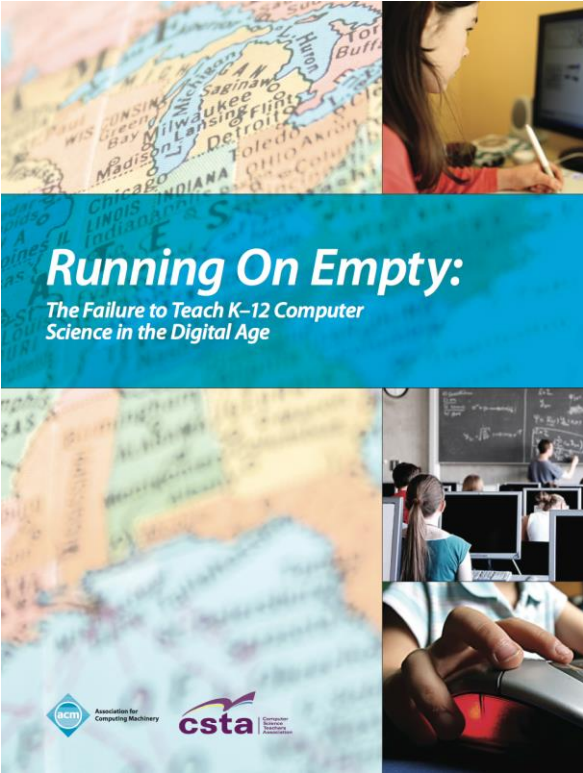
**To deliver**  
(inward)

# Two Challenges for our Community

**To clarify and set direction**  
(outward)

**To deliver**  
(inward)

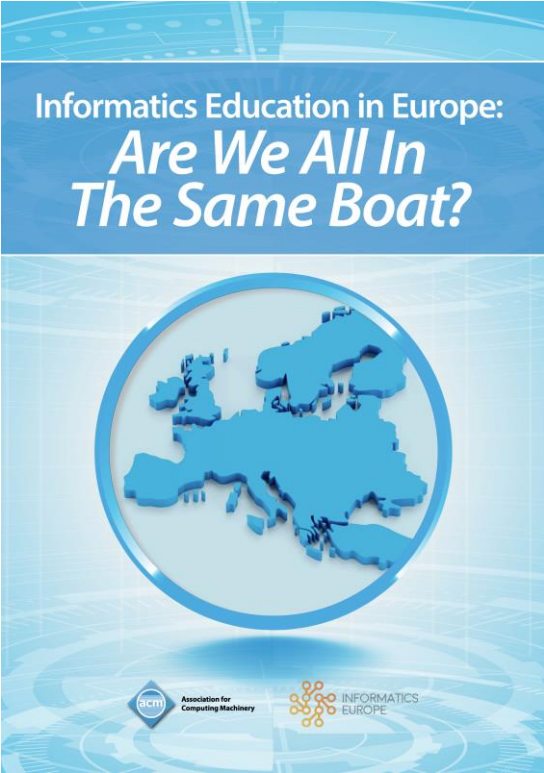
# Some important reports



US, 2010



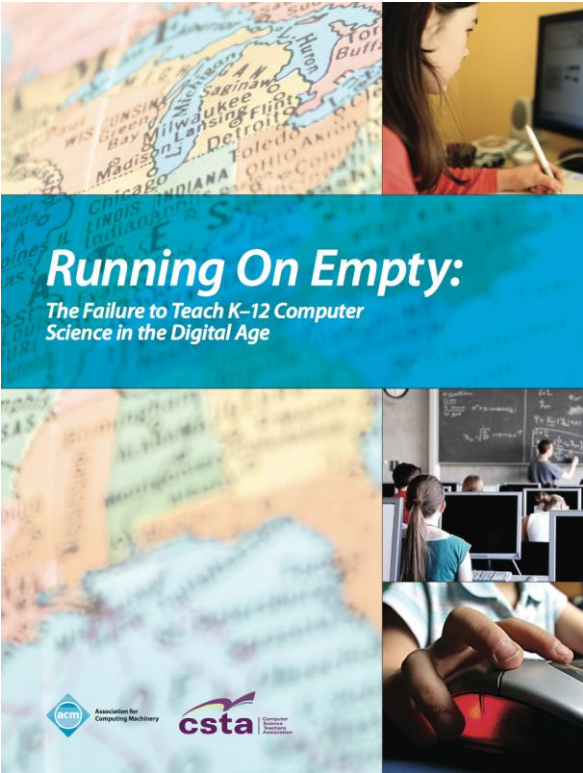
UK, 2012



IE/ACM-E, 2017



# Some important reports



US, 2010



UK, 2012



IE/ACM-E, 2017

2013  
2014  
2015  
2016

The White House  
Office of the Press Secretary

For Immediate Release

January 30, 2016

## Weekly Address: Giving Every Student an Opportunity to Learn Through Computer Science For All

Weekly Address: Giving Every Student an Opportunity to Learn Through Computer Science For All

WH  
.GOV

In the new economy, CS is not an optional skill,  
it is a basic skill, right along with the three R's

# CS for All



## Computer Science For All

JANUARY 30, 2016 AT 6:05 AM ET BY MEGAN SMITH

### CS For All


Computer Science for All is the President's bold new initiative to empower all American students from kindergarten through high school to learn computer science and be equipped with the computational thinking skills they need to be creators in the digital economy, not just consumers, and to be active citizens in our technology-driven world. Our economy is rapidly shifting, and both educators and business leaders are increasingly recognizing that computer science (CS) is a "new basic" skill necessary for economic opportunity and social mobility.




HOME | ABOUT | CONSORTIUM | RESOURCES | EVENTS | CONTACT




The **CsforAll Consortium** is a hub for the national **Computer Science for All** movement that works to enable all students in grades **K-12** to achieve CS literacy as an integral part of their educational experience.



**What Is CsforAll?**



**What We've Accomplished**




















**Get Involved**



## October 16 & 17

### Washington University in St. Louis

 <small>Lester Auerbach Director, Division of IT Institutions National Center for Women &amp; Information Technology</small>	 <small>Brian Bapich Associate Vice President &amp; Lead, Mozilla</small>	 <small>Jessica Anderson North America Quality Manager IBM Global</small>	 <small>Kathy Adler Adult Services National Science Foundation</small>	 <small>Roberta Avram Program Officer Technology Program Manager National Heritage Foundation</small>	 <small>Oliver Beach Chief Development Manager Korn Ferry</small>	 <small>Kurtis Babb Director, Division of Engineering &amp; Applied Sciences Washington University in St. Louis</small>	 <small>Adam Belski Program Officer for STEM Education Research American Association for the Advancement of Science</small>	 <small>Quincy Brown Director Computational High School</small>
 <small>Kathy Boucher Senior Vice President of Corporate Business Development</small>	 <small>Gemma Burrell Education Programs &amp; IT Services IBM</small>	 <small>Roberta Caplan Mid Atlantic Regional Manager Microsoft Customer Engagement</small>	 <small>David Cruise Senior Director of Youth Digital Engagement IBM &amp; Girls Clubs of America</small>	 <small>Jan Clary Program Officer National Science Foundation</small>	 <small>Ron Cytron Professor of Computer Science and Engineering Washington University</small>	 <small>Lugh Ann D'Alary Co-Founder, Chief Executive Officer CSEdU, Consortium</small>	 <small>Colleen Dewey Associate Vice President of Engineering IBM</small>	 <small>Rachel D'Amico Director Computational High School</small>
 <small>Chris Dow Executive Director CSEdU</small>	 <small>Jason Edger Academy IBM</small>	 <small>Amy Espinosa Vice President of Digital Engagement Director of the Insights Practice IBM Global</small>	 <small>James Evans Superintendent Learning Systems Baltimore, MD</small>	 <small>Ruth Farmer Chief Learning Officer CSEdU, Consortium</small>	 <small>Carol Frazier Deputy Director of the Center for STEM Education University of Texas at Austin</small>	 <small>Jeff Fries Associate Professor of IT &amp; Director of Computer Science Duke University</small>	 <small>Dave Fries Executive Associate Professor Johns Hopkins University</small>	 <small>Dore Frie Associate Director of the Center for Educational Innovation University College of The City of New York</small>
 <small>Kumar Gary Senior Associate STEM Lead, Opportunity Fund</small>	 <small>Lash Egan Vice President of Education, Strategy &amp; Innovation Cisco White House</small>	 <small>Suzanne Hooper Senior Director of National STEM Strategy at IBM of the USA</small>	 <small>David Kufner Chief Executive Officer IBM Global</small>	 <small>Amy Keenan Chief Customer Officer IBM Global</small>	 <small>Sue Kozma Executive Engagement Manager North America IBM Global</small>	 <small>Janis Lovgren Vice President Chief Data IBM Global</small>	 <small>Eppie Lurie Vice President Programs IBM Global</small>	 <small>Mark Leonard Vice President IBM Global</small>
 <small>Bryan Mizer Director of Strategy IBM Global</small>	 <small>Christina Mizer President IBM Global</small>	 <small>Arthur Morris Senior Manager of Community Engagement IBM Global</small>	 <small>Ron Gillette Executive Director IBM Global</small>	 <small>Anthony A. Dean State Director of Computer Science and IT Illinois</small>	 <small>John Parris Executive Director IBM Global</small>	 <small>Kevin Pothman Teacher IBM Global</small>	 <small>Judd Pothman Senior, Consultant to the Secretary of Education for STEM Illinois</small>	 <small>Peggy Peacock President IBM Global</small>

# Some important reports



US, 2010



UK, 2012



IE/ACM-E, 2017

Statutory guidance

# National curriculum in England: computing programmes of study

Published 11 September 2013

## Contents

Key stage 1

Key stage 2

Key stage 3

Key stage 4



## PRIMARY COMPUTING

COMPUTING AT SCHOOLS  
EDUCATE - ENGAGE - ENCOURAGE  
in collaboration with the Raspberry Pi Foundation



## Computing in the national curriculum

A guide for **secondary** teachers



FUNDED BY  
Department  
for Education



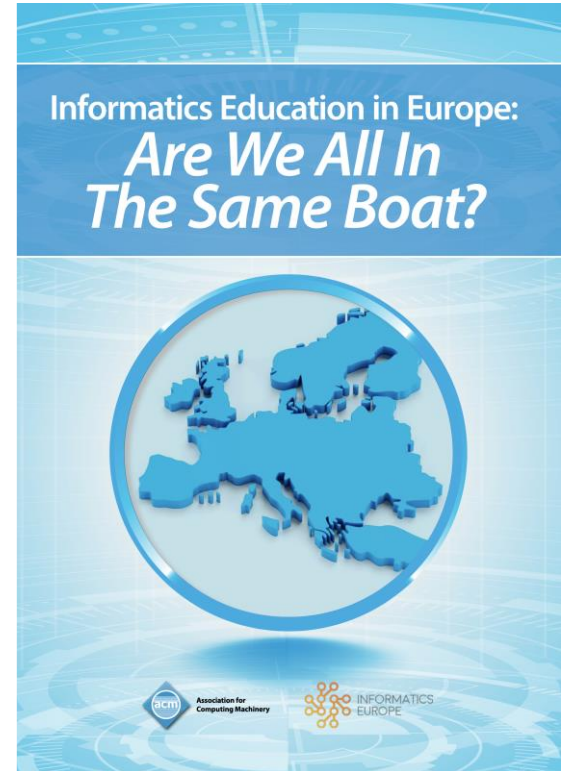
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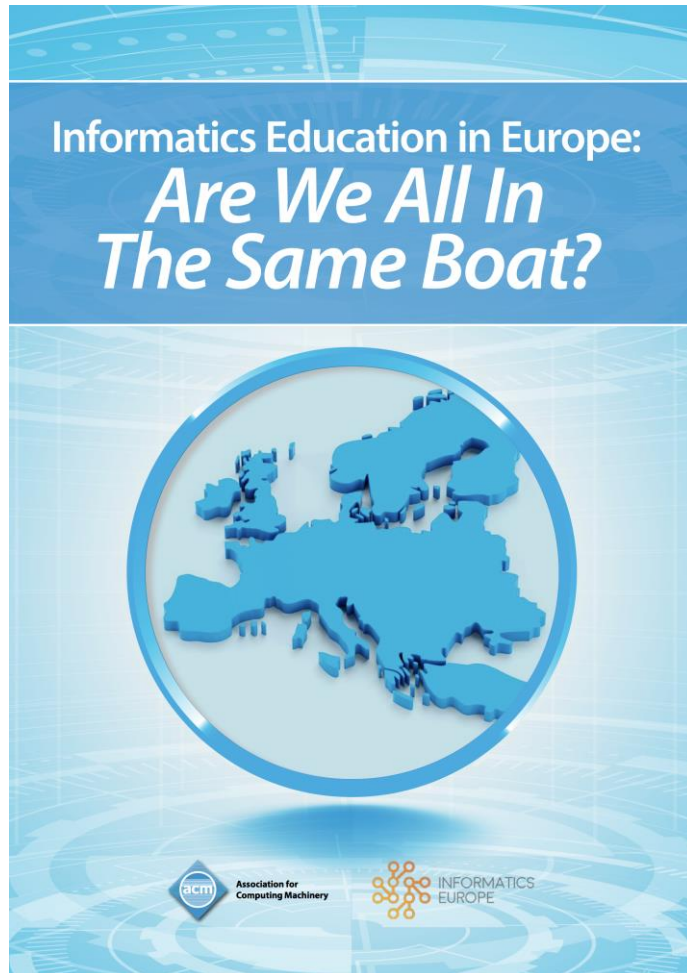


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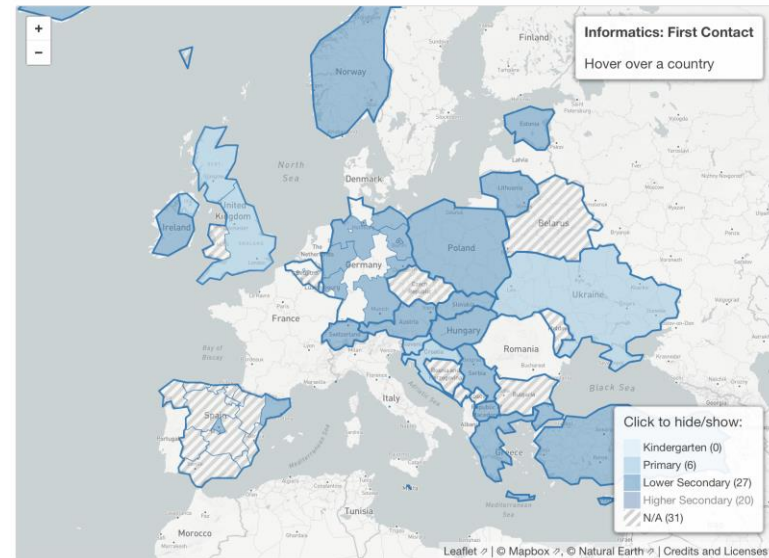


IE/ACM-E, 2017

# CECE Report (2017)



## Informatics: First Contact



## Recommendations

- Informatics (3)
- Digital literacy (3)
- Teacher training (2)

# CS for All

# Informatics for All



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[What Is CSforAll?](#)



[What We've Accomplished](#)



[Get Involved](#)

## Informatics for All

A similar joint effort  
by a coalition of  
the major  
informatics organisations  
in Europe





# Two-tier strategy:

## **Informatics and CT**

- as subject (specialisation)
- in all subjects (integration)

[ At all Educational Levels ]

# Informatics and CT

## New aspect of 'bildung'

### New basic competence for all

Art German Music ... Technology Design Geography  
Economy Social science English Psychology  
Geology Marketing Spanish Biology Literature  
History Physics Classical history Chinese Biotechnology

Reading Writing **Informatics** Mathematics

Mathematics is the language of science

**Informatics is (to become) the language of all subjects**

# **Informatics**

**– mathematics of the 21<sup>st</sup> century**

# **Programming**

**– writing of the 21<sup>st</sup> century**

# Two Challenges for our Community







**To clarify and set direction**  
(outward)

**To deliver**  
(inward)

# Our Grand Educational Challenge

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## Expansion of Informatics (think math+)

Educational level	In subjects (integration)	As subject (specialisation)
Higher		
Secondary		
Primary		

Conceive I4All ♦ Curriculum ♦ Materials ♦ Teachers (food chain) !

# We need your help outward!

Dissemination of CECE report across Europe

(Ministries, politicians, decision makers, ...)

Invite relevant parties to the I4All coalition

(Endorse our mission statement)

Approach EU and Countries/Regions

(The European Commission, Politicians, ...)

...

# We need your help inward!

Develop research-based knowledge about I4All  
(New groups in Informatics Departments)

Develop curriculum with a new mind-set  
(Not for wannabe experts, but for general education)

Develop teaching and learning materials  
(Kids, parents, teachers, teacher-teachers, , ...)

Skilled people high in the food chain  
(There is no food chain!)

...

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### CECE Report (2017)

**Informatics Education in Europe: Are We All In The Same Boat?**

**Informatics: First Contact**

**Recommendations**

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- Digital literacy (3)
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# Informatics

– mathematics of the 21<sup>st</sup> century

# Programming

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### Digital Competences in the 21<sup>st</sup> Century

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technology and way of working  
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## Two-tier strategy

### CS for All

### Informatics for All

**Computer Science for All**

**CS For All**

**Informatics for All**

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acm Europe

INFORMATICS EUROPE

### Informatics and CT New aspect of ‘bildung’ New basic competence for all

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