Soviel zur Struktur des Vortrages

> Informatische Bildung <
über den österreichischen **Teller**rand hinausgeschaut ...
Informatische Bildung

ein weltweites Feld...
Informatische Bildung
www.amazon.de/buecher
Größte Auswahl an Büchern. Jetzt portofrei bestellen.

Digitale Kompetenzen - Informatische Bildung - 8. Schulstufe
www.edugroup.at/.../digitale-kompetenzen-informatische-bildung-8-sch...

Digitale Kompetenzen – Informatische Bildung - IT-Betreuer
aps.it-betreuung.salzburg.at/.../75-digitale-kompetenzen-informatische-bi...
Digitale Kompetenzen – Informatische Bildung. Geschrieben von Roland Moser. Im digitalen Kompetenzmodell für die 8. Schulstufe wird beschrieben, welche ....

Bilder zu informatische bildung
Unangemessene Bilder melden

Weitere Bilder zu informatische bildung

Fachausschuss Informatische Bildung in Schulen ...
fa-ibs.gi.de/
Der Fachausschuss Informatische Bildung in Schulen (FA IBS) behandelt alle Fragen der Informatik in der schulischen Allgemeinbildung, um eine inhaltliche ...
International Federation for Information Processing

- The leading multinational, apolitical organization in Information & Communications Technologies and Sciences.
- Recognized by United Nations and other world bodies.
- Represents IT Societies from 56 countries/regions, covering five continents with a total membership of over half a million.
- Links more than 3500 scientists from Academia & Industry. Over 100 Working Groups and 13 Technical Committees.

Read more on the 'About IFIP' page.
In our rapidly changing world it is increasingly important not only to be an expert in your chosen field of study but also to be able to respond to developments, master new approaches to solving problems, and fulfill changing requirements in the modern world and in the job market. In response to these needs key competencies in understanding, developing and using new digital technologies are being brought into focus in school and university programs. Key competencies in informatics and ICT may be considered from different perspectives. The following are examples of important questions:

- Since students from all disciplines need informatics and ICT key competencies for their studies and for their future life - what are these key competencies?
- What are the research priorities in relation to understanding and developing key competencies in informatics and ICT?
- Are there key competencies which informatics and ICT foster exclusively or better than any other subject?
- How can these competencies be taught and how can students acquire these competencies?
- Which of these competencies are necessary for general education and daily life and which in order to master academic informatics studies? How does this impact on curriculum priorities?
- What key competencies does the job market expect from informatics students and from non-academic educated persons?
In Ländern wie Großbritannien oder der Slowakei lernen Kinder in der Pflichtschule zu programmieren, in Österreich gibt es vor der Oberstufe keinen Informatikunterricht.

Biber der Informatik

Ziel

Schülerinnen und Schüler mit den Konzepten und Denkweisen der Informatik vertraut zu machen

Zielgruppe

- Alle SchülerInnen von etwa 8 bis 20 Jahre.
- Die Teilnahme ist online und nur in der Schule von der 3. bis zur 13. Schulstufe möglich.
- Es gibt Aufgaben für 5 verschiedene Alterskategorien.

Konzept

Die Fragestellungen eignen sich gut als Einstiegspunkte für bestimmte Informatikthemen, die mit Hilfe der Biber-Aufgabenhefte vertieft werden können.

Die Fragen werden in Form von Rätseln präsentiert. Dadurch macht das Lösen der Aufgaben mehr Spaß und die Informatikkonzepte werden leicht zugänglich gemacht.

Der Weg zur Teilnahme

Pro Schule muss sich eine Lehrperson als Koordinator/in registrieren und kann dann die Gruppen der interessierten Schüler und Schülerinnen anmelden.

Der Wettbewerb wird online auf PCs oder Laptops üblicherweise im Rahmen des Unterrichts durchgeführt.

Weitere Informationen

- Zur Wettbewerbsplattform
- Die Besten 2013 | Urkundenvorlage
- Aufgabenhefte zum Download
- Statistiken

Aktuell

Heu rer haben 12.154 SchülerInnen teilgenommen! Vielen Dank an alle engagierten LehrerInnen und alle TeilnehmerInnen!

Die Registrierung für den Biber 2014 ist ab September 2014 offen!
Hotelschlüssel

Ein neues Schließsystem wird im Hotel Biber eingeführt. Der Gast erhält eine quadratische Plastikkarte mit 7 mal 7 Codepunkten. An jedem Codepunkt ist entweder ein Loch oder kein Loch.

Hier ist ein Beispiel einer Plastikkarte:

Im Zimmerschloss ist ein Codeleser. Die Codierung der Plastikkarte ist vorne und hinten, längs und quer symmetrisch. Es ist also egal, mit welcher Ausrichtung der Gast die Plastikkarte ins Zimmerschloss steckt.

Wie viele verschiedene Plastikkarten kann es geben?

A) 16  
B) 49  
C) 1024  
D) 65536
Internationale Olympiade aus Informatik (IOI)

Zielgruppe
Alle SchülerInnen und Jugendliche, die mindestens 14 Jahre sind und am 1. Juli des Wettbewerbsjahres das 20. Lebensjahr noch nicht vollendet haben, die Freude am Programmieren anspruchsvoller Algorithmen haben und die eine der Programmiersprachen Pascal, C oder C++ beherrschen.

Ziel
Die erfolgreiche Teilnahme an der IOI.

Konzept
Das schnelle Erfassen der Problemstellung, die Ausarbeitung und die programmtechnische Umsetzung eines Lösungsweges sind die Fähigkeiten, die von den TeilnehmerInnen gefordert werden. Aus allen BewerberInnen, die die Lösung der vorgegebenen Aufgabe bis zum Einsendeschluss des jeweiligen Jahres an die OCG eingesandt haben, errnitt die Jury 10 – 20 SchülerInnen, die sich in einem Trainingscamp auf den Bundeswettbewerb vorbereiten können. In dessen Rahmen werden die 4 TeilnehmerInnen errmitt, die Österreich bei der Olympiade vertreten werden.

Der Weg zur Teilnahme
1. Informationen einholen (OCG Website, Folder)
2. Registrierung
3. Lösung der vorgegebenen Arbeiten
4. IOI Qualifikation 2014

Wirklicher Skandal!

Die österreichischen IOI Teams konnten bisher schon 25 Medaillen erringen. Doch noch erreichen uns vom BMUKK schlechte Neuigkeiten:

Vom BMUKK kann aufgrund der Budgetlage einer Teilnahme Österreichs an der Internationalen Informatikolympiade in Taiwan 2014 nicht zugestimmt werden.

Wir sind bemüht, unser Team 2014 dennoch wie gewohnt zur IOI zu bringen!


Mehr...
Große Scheune


BEISPIEL

Nimm den folgenden Raster von Markus’ Farm an, wobei „•“ eine Parzelle ohne Bäume und „#“ eine Parzelle mit Bäumen repräsentiert.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
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<th>8</th>
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</tbody>
</table>

Die größte Scheune ist $5 \times 5$ und kann an zwei Positionen im rechten unteren Teil des Rasters platziert werden.

PROGRAMMNAME: Scheune
Eingabeformat (einlesen über Standard-Input)
Zeile 1: zwei ganze Zahlen: $N \ (1 \leq N \leq 1000)$, die Anzahl der Parzellen auf einer Seite, und $T \ (1 \leq T \leq 10000)$, die Anzahl aller Parzellen mit Bäumen
Zeilen 2..$T+1$: jeweils zwei ganze Zahlen zwischen 1 und $N$ (jeweils inklusive), Reihe und Spalte einer Baumparzelle

Beispielleingabe:

8 3
2 2
2 6
6 3
http://www.computingatschool.org.uk

ICT and Computer Science in UK schools

Naace, ITTE, and the Computing at School Working Group, June 2012

**Naace** is a professional membership association of educators, technologists, policy makers, school leaders and teachers who represent the role of technology in advancing education. Naace is recognised as the Information and Communication Technology (ICT) subject association for teachers and schools.

**Computing at School** (CAS) is a grassroots organisation for Computer Science teachers in UK schools. Membership includes teachers, parents, governors, exam boards, industry, professional societies, and universities. CAS is a collaborative partner with the BCS through the BCS Academy of Computing. CAS is recognised as the subject association for Computer Science.

**The Association for IT in Teacher Education** (ITTE) is the professional association for IT teacher training across the UK. Its members are involved in initial teacher training of primary teachers, subject specialist ICT and computer science teachers in secondary and post-16, Technology Enhanced Learning (TEL) across all subjects and research into ICT/computer science/TEL pedagogy.
Imagine the dramatic change which could be possible in just a few years... Instead of children bored out of their minds being taught how to use Word and Excel by bored teachers, we could have 11–year olds able to write simple 2D computer animations ... By 16, they could have an understanding of formal logic previously covered only in university courses and be writing their own apps for smartphones. (Gove, 2012)

The European nations are harming their high school students, both educationally and economically, by failing to offer them an education in the fundamentals of computer science.“ (Peyton-Jones, 2012)
Computational Thinking???

Zur Auflockerung und Konkretisierung!

Was hat dieses Beispiel in der Informatik verloren?
Key stage 3

Ages 11-14, Years 7, 8 and 9

Pupils should be taught to:

- design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
- understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
- use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
- understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]
- understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- understand how instructions are stored and executed; understand how data of various types can be stored, represented and manipulated digitally, in the form of binary digits
- undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
- create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
- understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns
Computing curriculum: Digital skills versus computer science

Experts tell Sophie Curtis the new computing curriculum focuses too heavily on computer science, at the expense of other digital skills.

The national shortage of cyber skills is a key issue for businesses and government.

Photo: Alamy
Das ewige Problem IT vs. „reine“ Informatik ...

**GirlWritesWhat4PM**  -  3 months ago


---

**Matthew Tipton**  -  3 months ago

As a teacher tasked with developing a Computing POS, I have taken the approach that I will deliver the Computer Science curriculum so that the students acquire the knowledge and skills, but they then create projects and artefacts in lesson using Digital Literacy to demonstrate acquisition of the knowledge and skills. For example, I currently have a year 8 group learning about Networks, but they will demonstrate that knowledge by creating a film for vodcast entitled "What is the Internet and how does it work?" They will have to carry out web based research and demonstrate the ability to use film editing software and creative skills (Digital Literacy) whilst learning about Networks. (Computer Science.) My year 9 group are doing something similar with Algorithms in Flowol. It is possible for the two strands to be developed in the same classroom hand in hand. There will still be a few units solely dedicated to Digital Literacy, such as E Safety and Spreadsheet Modelling, but they are the exception.

---

**William T Goodall**  -  3 months ago

Computer literacy and computer science are quite different things and teaching them in the same class makes no sense. It is like teaching driving and auto repair together.
Barack Obama: High Schools Should Offer Programming and Graphic Design Courses

Posted on February 22, 2013 by Diana Smith — No Comments ↓

Last week President Barack Obama participated in a Fireside Google+ Hangout where Google’s hand-picked participants asked him questions in the spirit of Franklin Delano Roosevelt’s “Fireside Chats,” though with interactivity of 2013.
President Obama: 

High Schools Should Offer Programming and Graphic Design Courses

Given how pervasive computers and the Internet is now and how integral it is in our economy and how fascinated kids are with it, I want to make sure that they know how to actually produce stuff using computers and not simply consume stuff …

We’re going to start setting those programs in our high schools, not waiting to go to community college.

---

\textsuperscript{a}Fireside Hangout on Google+, Mountain View, Feb 2013

\textsuperscript{b}http://tinyurl.com/pgf2cx2
The State of US Computer Science Education

9 out of 10 schools don’t even offer computer programming classes

IN 41 OF 50 STATES, CODING CLASSES DON'T COUNT TOWARDS HIGH SCHOOL GRADUATION MATH OR SCIENCE REQUIREMENTS.

http://www.i-programmer.info/professional-programmer/i-programmer/5673-teach-code-in-school-before-its-too-late.html

Die schulische Realität ...
EVALUATING our EDUCATION:

What Americans *Really* Think About Our School Subjects

From a young age, we learned it's cool to stay in school, but just how well does that schooling stay with us? Surely, our education's usefulness depends on the career fields we pursue, but that doesn't necessarily mean we value the subjects we've learned according to how useful they've been in our lives. Here, we take a look at America's feelings on school subjects.

**WHICH SUBJECT HAS BEEN MOST VALUABLE IN YOUR LIFE?**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>34%</td>
</tr>
<tr>
<td>English/Literature/Reading</td>
<td>21%</td>
</tr>
<tr>
<td>Science/Physics/Biology</td>
<td>12%</td>
</tr>
<tr>
<td>History</td>
<td>8%</td>
</tr>
<tr>
<td>Business/Finance/Accounting</td>
<td>4%</td>
</tr>
<tr>
<td>Psychology</td>
<td>3%</td>
</tr>
<tr>
<td>Economics</td>
<td>2%</td>
</tr>
<tr>
<td>Foreign Language/Language Arts</td>
<td>1%</td>
</tr>
<tr>
<td>Theology/Religion</td>
<td>1%</td>
</tr>
<tr>
<td>Economics</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>?</td>
</tr>
</tbody>
</table>

Unchanged since 2002
Biggest gainer, up from 4% in '02
Down from 20%

Hier kommt Computer Science (noch) nicht vor ...
Teach Code In School - Before It's Too Late!

Written by Sue Goo
Friday, 22 March 2013

Article Index
Teach Code In School - Before It's Too Late!
Start early, aim high

Page 1 of 2
Is programming a topic that should be taught in schools? Or should we let kids discover it for themselves? Recent evidence suggests in Vietnam half of the students in grade 11 classes could pass the Google interview process! This is not good enough - grade 11 students everywhere should be able to pass the Google interview.

Earlier this week Microsoft announced it was including a Kodu Challenge as part of the Imagine Cup. We welcomed this as an indication that Microsoft was acknowledging the impending crisis of insufficient STEM, and specifically Computer Science, graduates joining the work force to meet the ever-increasing demand for such skills.

But is this the right response - or does it just let schools continue to treat learning to program as some fun and optional activity rather than putting it into the mainstream curriculum?

The argument that:
Every student in every school should have the opportunity to learn to code
is being made in a high profile way on Code.org, a new website that was recently launched with support from "leaders and trendsetters" including President Bill Clinton, Bill Gates, Mark Zuckerberg, and Salman Kahn.
<table>
<thead>
<tr>
<th>Definition</th>
<th>Grades PK to 2</th>
<th>Grades 3 to 5</th>
<th>Grades 6 to 8</th>
<th>Grades 9 to 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Collection</td>
<td>Conduct an experiment to find the fastest toy car down an incline and record the order of cars across the finish line in a chart.</td>
<td>Review examples of appropriate information, identify strategies, and write an essay.</td>
<td>Design survey questions to gather appropriate information to answer questions (e.g., asking fellow students if they were absent from school in the past month and whether they were suffering from the flu).</td>
<td>Students develop a survey and collect both qualitative and quantitative data to answer the question: “Has global warming changed the quality of life?”</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>Make generalizations about the data, analyze strong and weak points, and order of finishing a task. Use examples of writing samples to develop a rubric.</td>
<td>Test conditions and select the appropriate activity to achieve the desired results.</td>
<td>Use appropriate statistical methods that will best test the hypothesis: “Global warming has not changed the quality of life.”</td>
<td>Use appropriate statistical methods that will best test the hypothesis: “Global warming has not changed the quality of life.”</td>
</tr>
<tr>
<td>Data Representation</td>
<td>Depicting and organizing the data in a table, chart, or a line drawing shows how the speed of a toy car changes when its weight is changed.</td>
<td>Match each writing sample to the rubric and create a chart showing which example best fits in each category of the rubric.</td>
<td>Groups of students represent the same data in different ways based on a position relating to the question: “Has global warming changed the quality of life?” Different representations may result in varying conclusions.</td>
<td>Groups of students represent the same data in different ways based on a position relating to the question: “Has global warming changed the quality of life?” Different representations may result in varying conclusions.</td>
</tr>
<tr>
<td>Problem-Solving</td>
<td>Breaks into smaller, manageable parts.</td>
<td>Develop a plan to make the school “green.” Separate strategies such as recycling paper and cans, reducing use of electricity, and composting food waste.</td>
<td>In planning the publication of a monthly newsletter, identify roles, responsibilities, timeline, and resources needed to complete the project.</td>
<td>Consider the large-scale problem: “What does it take to become a rock star?” Break it into smaller parts. Discuss what variables are within a student’s control and what variables are determined by outside factors.</td>
</tr>
<tr>
<td>Decomposing</td>
<td>Create directions to a location in the school by breaking the directions down into smaller geographical zones. Join the sections of directions together into a whole.</td>
<td>After studying a period in history, identify symbols, themes, events, key people, and values that are most representative of the time period (e.g., coat of arms).</td>
<td>After studying a period in history, identify symbols, themes, events, key people, and values that are most representative of the time period (e.g., coat of arms).</td>
<td>After studying a period in history, identify symbols, themes, events, key people, and values that are most representative of the time period (e.g., coat of arms).</td>
</tr>
<tr>
<td>Abstraction</td>
<td>Reducing complexity to define main idea</td>
<td>With many sizes and colors of three-sided shapes, the abstract is a triangle.</td>
<td>Abstraction</td>
<td>Abstraction</td>
</tr>
</tbody>
</table>

**US-Export: Computational Thinking**
<table>
<thead>
<tr>
<th><strong>Definition</strong></th>
<th><strong>Grades PK to 2</strong></th>
<th><strong>Grades 3 to 5</strong></th>
<th><strong>Grades 6 to 8</strong></th>
<th><strong>Grades 9 to 12</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Algorithms &amp; Procedures</strong></td>
<td>Series of ordered steps taken to solve a problem or achieve some end.</td>
<td>Create a set of directions from the school to the major landmarks in the neighborhood.</td>
<td>Design a board game, write instructions, and tell the player that they have to get back from the starting point, back from the game.</td>
<td>Discuss the decision-making process for choosing a college, then create an algorithm that describes that process. The algorithm will be able to handle unknown variables, such as where friends are attending, availability of financial aid, and admission success, to come to an unambiguous decision.</td>
</tr>
<tr>
<td><strong>Automation</strong></td>
<td>Having computers or machines do repetitive or tedious tasks.</td>
<td>Converse with another student about the differences between automatic and non-automatic systems.</td>
<td>Investigate what automation is through real-world examples, like barcodes, teller machines, and library bar codes.</td>
<td>Debate the merits of learning skills and information that are rarely necessary today because of automation. These skills might include long division, deriving square roots, spelling, statistical formulas, memorizing historic dates, etc.</td>
</tr>
<tr>
<td><strong>Simulation</strong></td>
<td>Representing a set of directions has been created, act out the steps to be sure they are correct.</td>
<td>Create an animation to demonstrate the understanding of a process.</td>
<td>Use a model of a simple ecosystem to conduct experiments that answer what happens to the ecosystem if some percentage of the producers die. The user controls the percentage that dies off.</td>
<td>Create a spreadsheet to simulate the “Birthday Problem” (How many people must be in a room for there to be at least a 50% chance that at least two have the same birthday?). Use the same model to answer the question for three people having the same birthday.</td>
</tr>
<tr>
<td><strong>Paradigm</strong></td>
<td>Organize resources to simultaneously carry out tasks to reach a common goal.</td>
<td>Based on a set of criteria, break the class into two groups. Have one group read aloud while the other group provides humming background music. The goal is reached, but the whole is better than the individual parts.</td>
<td>Teachers facilitate in planning team project timelines, roles, and assignments and working together to complete components (how do we break up the tasks, what tasks have to be done sequentially and others simultaneously, check ins, meeting deadlines?).</td>
<td>Describe the sequence of activities by each of the armies leading to the Battle of Waterloo. Include both physical activities (e.g., recruit troops) and intellectual activities (e.g., pick troop positions).</td>
</tr>
</tbody>
</table>
Es hat auch eine European Hour of Code gegeben, was aber unter der Wahrnehmungsgrenze …

Adding Coding to the Curriculum

By BETH GARDINER  MARCH 23, 2014

LONDON — Estonia is teaching first graders how to create their own computer games and offering scholarships to entice more undergraduates into technology-driven disciplines. In England, an updated national curriculum will expose every child in the state school system to computer programming, starting at age five. The American “Hour of Code” effort says it has already persuaded 28 million people to give programming a try.

Around the world, students from elementary school to the PhD level are increasingly getting acquainted with the basics of coding, as computer programming is also known. From Singapore to Tallinn, governments, educators and advocates from the tech industry argue that it has become crucial to hold at least a basic understanding of how the devices that play such a large role in modern life actually work.
Informatics Europe proudly announces its 2014 Best Practices in Education Award devoted to initiatives promoting informatics education in primary and secondary schools.

The Informatics Europe Best Practices in Education Award recognizes outstanding European educational initiatives that improve the quality of informatics teaching and the attractiveness of the discipline, and can be applied and extended beyond their institutions of origin.

As in 2013, the Award will reward a successful teaching effort in Europe that:

- has made a measurable difference in informatics education in schools
- is widely applicable and useful for the teaching community
- has made a measurable impact in its original institution and beyond it
All of Europe’s citizens need to be educated in both digital literacy and informatics.

European countries are making good progress in including digital literacy in the curriculum. The teaching of this topic should emphasize the proper use of information technology resources and cover matters of ethics such as privacy and plagiarism.

Informatics education, unlike digital literacy education, is sorely lacking in most European countries. The situation has paradoxically worsened since the 70s and 80s.

Unless Europe takes resolute steps to change that situation, it will turn into a mere consumer of information technology and miss its goal of being a major player.
• **Recommendation 1.** All students should benefit from education in digital literacy, starting from an early age and mastering the basic concepts by age 12. Digital literacy education should emphasize not only skills but also the principles and practices of using them effectively and ethically.

• **Recommendation 2.** All students should benefit from education in informatics as an independent scientific subject, studied both for its intrinsic intellectual and educational value and for its applications to other disciplines.

• **Recommendation 3.** A large-scale teacher training program should urgently be started. To bootstrap the process in the short term, creative solutions should be developed involving school teachers paired with experts from academia and industry.

• **Recommendation 4.** The definition of informatics curricula should rely on the considerable body of existing work on the topic and the specific recommendations of the present report (section 4).
Applications versus Fundamentals

- Barbara Demo: A paradox: we were better when we were worse.
  - Around 1985 no software aids to mathematics teaching available. Informatics meant introduction to programming, usually with Pascal.
  - Over the years with tools like “Derive” or “Cabri” or “Octave” the need of even a limited capacity of programming in a general-purpose language disappeared. Informatics reduced to the use of specialized tools.
  - Widespread offering in schools of the ECDL strongly contributed to the vision of computer science as the usage of software tools.

- David Braben explains BBC’s Rory Cellan-Jones the Raspberry Pi scheme designed to give a £15 computer on a stick to every child.

**ICT↔CS:** David Braben Might generate similar fascination for the youth as Amiga and Commodore 64 did in 1985.
Since August 2009 I am a professor emeritus of ETH. My last lecture May, 25, 2009 (Abschiedsvorlesung) is available [here](#). A picture taken at this occasion is [here](#).

Activities:

I am interested and involved in promoting computer science as mandatory subject in the Gymnasium in Switzerland. Therefore I work part time in ABZ, the education center of Prof. Juraj Hromkovic.

I have chaired a committee of Informatics Europe and ACM Europe working on a report on Informatics Education. Informatics education. The report published April 2013 with the title "Informatics - miss the boat" is available [here](#).

Die deutschschweizerische Erziehungsdirektorenkonferenz arbeitet an einer Revision des Schulstoffes: Lehrplan 21 Unverständlicherweise ist Informatik nicht als Grundlagenfach vorgesehen. Es geschrieben, der leider nicht publiziert worden ist: [hier](#).

I am also a guest professor at Baptist University Hong Kong, visiting the Institute for Computational Mathematics during Spring Semester.

I was a member of the board of ICT-Switzerland and also president of its Education Committee (Kommission Bildung)

Recent Talks:

- IV CONGRESSO ESPANOL DE INFORMATICA Sept 17--20, 2013
  *Informatics = Basic Subject, Challenge and Chance*

- European Computer Science Summit (ECSS) Barcelona, Nov 21, 2012
  *Informatics in Schools? -- Urgently Needed!*

  *Alle machen Fehler -- Auch Computer*
Hinweis
Der hier abgebildete Lehrplan 21 wird zurzeit überarbeitet.

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<td>Deutsch</td>
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<td>Mathematik</td>
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<td>Natur und Technik</td>
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<td>Natur und Technik</td>
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<td>(mit Physik, Chemie, Biologie)</td>
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<td>Wirtschaft, Arbeit, Haushalt</td>
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<td>Wirtschaft, Arbeit, Haushalt</td>
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<td>(mit Hauswirtschaft)</td>
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<td>(mit Hauswirtschaft)</td>
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<td>Räume, Zeiten, Gesellschaften</td>
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<td>Räume, Zeiten, Gesellschaften</td>
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<tr>
<td>(mit Geografie, Geschichte)</td>
<td></td>
<td>(mit Geografie, Geschichte)</td>
</tr>
<tr>
<td>Ethik, Religionen, Gemeinschaft</td>
<td></td>
<td>Ethik, Religionen, Gemeinschaft</td>
</tr>
<tr>
<td>(mit Lebenskunde)</td>
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<td>(mit Lebenskunde)</td>
</tr>
</tbody>
</table>

Wir werden in Österreich in Bälde NICHT um eine ordentliche Curriculumsdiskussion herumkommen!
APPROPOS SCHWEIZ ...

Private ICT-Nutzung

Schulische ICT-Nutzung

Medien

Informatikgrundlagen

Anwendungs- kompetenzen

Private ICT-Infrastruktur

Schulische ICT-Infrastruktur

http://de.slideshare.net/beatdoebeli
Good Example: Slovakia

- Subject Informatics = \{Digital Literacy, Informatics\} interwoven

- **compulsory (!)** from primary school (from 2nd grade) to lower and upper secondary school

- in primary school **emphasis more on digital literacy,**
  in upper secondary school **more on informatics**

- Programming: lower secondary school LOGO, upper secondary school usually Pascal

- Main topics:
  - Digital World
  - Programming and Algorithms
  - Computer Systems
  - Informatics and Society
Hong Kong P1–P6: primary school, F1–F6: secondary school

- Digital Literacy and Informatics not strictly separated (Computer Literacy)

<table>
<thead>
<tr>
<th>Computer Literacy</th>
<th>Informatics</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1–P6 1–2 lessons per week</td>
<td>there is LOGO programming</td>
</tr>
<tr>
<td>F1–F3 1–2 lessons per week</td>
<td>(school-based) there is Visual Basic programming, Pascal, Raptor (flowcharting)</td>
</tr>
<tr>
<td>F4–F6</td>
<td>software development option: one of 4 languages: Visual Basic, Java, C or Pascal</td>
</tr>
<tr>
<td></td>
<td>database option: SQL</td>
</tr>
<tr>
<td></td>
<td>multimedia production &amp; website development: script language</td>
</tr>
</tbody>
</table>

- Recommendation:

  ICT Curriculum and Assessment Guide (Secondary 4–6)
Vietnamese high school kids can pass Google interview

Google engineer makes shock discovery on fact-finder

By Phil Muncaster, 22 Mar 2013

Google engineer Neil Fraser got a bit of a surprise when he visited Vietnam recently to see how schools teach ICT: kids in 11th grade are capable of passing the Chocolate Factory’s notoriously difficult interview process.
CS in VN

16 March 2013

During my recent trip to Vietnam I took the opportunity to visit some schools and see how computer science was taught there. Officially it is simpler (and the results are more representative) to simply show up unannounced. A business card from Google doesn’t hurt either.

Computer classes start in grade 2. They begin with the basics – which of course includes how to take care of your 5.25” floppy disks.

By grade 3 they are learning to how to use Microsoft Windows. Vietnam is a 100% Windows XP monoculture. Probably all with the same understanding.

Để mở một Tập đã được lưu trên máy tính, em cần nhấp tên thư mục chứa tập đó. Hãy thực hiện các thao tác để mở của số tương tự như hình 10, sau đó thực hiện các bước chỉ dẫn trong hình 11 dưới đây:
Blockly is a web-based, graphical programming editor. Users can drag blocks together to build an application. No typing required.

Check out our sample applications:

- **Puzzle** - Learn how blocks work while solving this simple country quiz.
- **Maze** - Use Blockly to solve a maze.
- **Turtle** - Drawing with Blockly.
- **Graph** - Blockly's graphing calculator.
- **Code** - Export a Blockly program into JavaScript, Python or XML.

Blockly is international. Help us translate Blockly into even more languages.

**Blockly for Developers**

Blockly is a component that may be useful for a variety of projects, including educational tools. We want developers to be able to play with Blockly, give feedback, and think of novel uses for it. All the code is free and open source. Join the [mailing list](mailto:mailing.list) and let us know what you think.

External projects using Blockly include:

- [MIT App Inventor](http://code.google.com/appinventor) - IDE for Android apps.
- [Code.org](http://code.org) - K-12 computer science.
- [Play-i](http://play-i.org) - Robots for play and education.
- [BlocklyQuno](http://blocklyquno.com) - Arduino code generator.
- [CustomPacker](http://custompacker.com) - Human-robot packing system.
- [GigaBryte](http://gigabryte.com) - Wearable computers.
- [Romotive](http://romotive.com) - Phone-controlled robots.
- [seal-blockly](http://seal-blockly.com) - SEAL script support.
- [Blockly and Espruino](http://blockly.espruino.com) - Graphical Programming for Microcontrollers.
- [Blockly Marx](http://blockly-marx.org) - Educational project demonstrating design of control systems for simulated and real-world contexts.
- [Truffle Blocks](http://truffleblocks.com) - A visual programming language based on Blockly for making isometric games in the browser.
A year and a half ago I released Blockly, and wrote:

"Blockly still has a long way to go, but at least it's now out in the open. Oh, and it's open source, so dig in and build something.

And that's what people did. Blockly has been translated to 43 languages. MIT's App Inventor replaced their previous visualisation (which was for children. Other Blockly-controlled robots showed up in a TED talk and in a European factory. GigaBryte are creating Blockly programs to over twenty thousand children this month.

Not bad for a project that was once dead. Fairly early in the development process Blockly was cancelled and I was reassigned to work on only available option and expended all my accrued vacation. Every day I'd come into the office and work on Blockly. After two months of that project, and retroactively gave me back my vacation. Yet another example of why I love Google.

https://neil.fraser.name/news/2013/12/31
Problem in summary:
You can put a stick of $\sqrt{2}$ length in diagonal to make a maze. The maze contains closed area or open area. Given the maze, you are required to count the number of closed area and to find the area of the largest one.
For the maze of the picture below, we have 2 closed area and the largest one has area of 8.

Trên một tấm kính hình chữ nhật kích thước $M \times N$ được chia từng trường thành $M \times N$ ô vuông kích thước $1 \times 1$, người ta gắn những miếng kính nằm vuông góc với nó tại vị trí một trong hai đường chéo của mỗi ô, chiều dài mỗi miếng là $\sqrt{2}$ và chiều cao là 1, bể đầy của các miếng kính là không dâng kế (xem hình dưới). Các vị trí tiếp xúc được gắn đủ để nước không thấm qua. Bằng cách đó, có thể có những vùng độc lập với nhau chứa được những lượng nước nhất định. Kết quả là ta thu được một bể cát kỳ quặc, có thể dùng để thả cá vào mỗi vùng đó.

Yêu cầu: Cho trước một trạng thái của bể cát, hãy xác định bể có bao nhiêu vùng và lượng nước chứa được trong vùng lớn nhất (vùng chứa nhiều nước nhất). Hình bên cho thấy bể cát có 2 vùng, vùng lớn nhất chứa lượng nước là 8.
Australia is about to move to a National Curriculum that includes Digital Technologies as a subject throughout all years of schooling. It is built on five key concepts:

- **Abstraction**, which underpins all content, particularly the content descriptions relating to the concepts of *data representation* and *specification*, *algorithms* and *implementation*

- **Data collection** (properties, sources and collection of data), **data representation** (symbolism and separation) and **data interpretation** (patterns and contexts)

- **Specification** (descriptions and techniques), **algorithms** (following and describing) and **implementation** (translating and programming)

- **Digital systems** (hardware, software and networks and the internet)

- **Interactions** (people and digital systems, data and processes) and **impact** (impacts and empowerment).

Computational Thinking is very much a part of this.

In 3.5 we have also always been aware of the role of ICT (for want of a better term) to support and enhance learning across the curriculum. This is something that is very important in the big picture of what digital technologies mean in school contexts.

Again in the new Australian Curriculum, we use ICT as a General Capability that has learning outcomes and expectations throughout all curriculum areas (including the Digital Technologies subject).

Attachments:

- Draft Australian Curriculum Technologies - February 2013.pdf, 606 KB
## Digital Technologies Foundation to Year 10 scope and sequence

<table>
<thead>
<tr>
<th>Strand</th>
<th>Foundation to Year 2</th>
<th>Years 3 and 4</th>
<th>Years 5 and 6</th>
<th>Years 7 and 8</th>
<th>Years 9 and 10 (Elective subject)</th>
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<tbody>
<tr>
<td><strong>Digital systems</strong></td>
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<tr>
<td>2.1 Identify and use digital systems (hardware and software components) for a purpose</td>
<td>4.1 Explore and use a range of digital systems with peripheral devices for different purposes, and transmit different types of data</td>
<td>6.1 Investigate the main components of common digital systems, their basic functions and interactions and how such digital systems may connect together to form networks to transmit data</td>
<td>8.1 Investigate how data are transmitted and secured in wired, wireless and mobile networks, and how the specifications of hardware components impact on network activities</td>
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<tr>
<td><strong>Representation of data</strong></td>
<td>2.2 Recognise and explore patterns in data and represent data as pictures, symbols and diagrams</td>
<td>4.2 Recognise different types of data and explore how the same data can be represented in different ways</td>
<td>6.2 Investigate how digital systems use whole numbers as a basis for representing all types of data</td>
<td>8.2 Investigate how digital systems represent text, image and audio data in binary</td>
<td>10.2 Analyse simple compression of data and how content data are separated from presentation</td>
</tr>
<tr>
<td><strong>Collecting, managing and analysing data</strong></td>
<td>2.3 Collect, explore and sort data, and use digital systems to present the data creatively</td>
<td>4.3 Collect, access and present different types of data using simple software to create information and solve problems</td>
<td>6.3 Acquire, store and validate different types of data, and use a range of commonly available software to interpret and visualise data in context to create information</td>
<td>8.3 Acquire data from a range of digital sources and evaluate its authenticity, accuracy and timeliness</td>
<td>10.3 Develop techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements</td>
</tr>
<tr>
<td><strong>Creating digital solutions by:</strong></td>
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<tr>
<td><strong>Defining</strong></td>
<td>2.4 Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems</td>
<td>4.4 Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them</td>
<td>6.4 Define problems in terms of data and functional requirements, and identify features similar to previously solved problems</td>
<td>8.5 Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints</td>
<td>10.5 Precisely define and decompose real-world problems, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs</td>
</tr>
<tr>
<td><strong>Designing</strong></td>
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<tr>
<td><strong>Implementing</strong></td>
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<tr>
<td><strong>Testing and evaluating</strong></td>
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<tr>
<td>Designing</td>
<td>Implementing</td>
<td>Evaluating</td>
<td>Collaborating and managing</td>
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<tr>
<td>6.5 Design a user interface for a digital system, generating and considering alternative designs</td>
<td>6.6 Design, modify and follow simple algorithms represented diagrammatically and in English involving sequences of steps, branching, and iteration (repetition)</td>
<td>6.8 Explain how developed solutions and existing information systems are sustainable and meet local community needs, considering opportunities and consequences for future applications</td>
<td>2.6 Work with others to create and organise ideas and information using information systems, and share these in safe online environments</td>
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<tr>
<td>8.5 Design the user experience of a digital system, generating, evaluating and communicating alternative designs</td>
<td>8.7 Design algorithms represented diagrammatically and in English; and trace algorithms to predict output for a given input and to identify errors</td>
<td>8.9 Evaluate how well developed solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability</td>
<td>4.7 Work with others to plan the creation and communication of ideas and information including online collaborative projects, applying agreed ethical and social protocols</td>
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<tr>
<td>10.6 Design the user experience of a digital system, evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics</td>
<td>10.7 Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases</td>
<td>10.9 Critically evaluate how well developed solutions and existing information systems and policies, take account of future risks and sustainability and provide opportunities for innovation and enterprise</td>
<td>6.9 Manage the creation and communication of ideas and information including online collaborative projects, applying agreed ethical, social and technical protocols</td>
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<tr>
<td>6.7 Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input</td>
<td>8.3 Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language</td>
<td>8.10 Create and communicate interactive ideas and information collaboratively online, taking into account social contexts and legal responsibilities</td>
<td>8.11 Plan and manage projects, including tasks, time and other resources required, considering safety and sustainability</td>
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<tr>
<td>4.5 Implement digital solutions as simple visual programs with algorithms involving branching (decisions), and user input</td>
<td>10.8 Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language</td>
<td>8.10 Create interactive solutions for sharing ideas and information online, taking into account social contexts and legal responsibilities</td>
<td>2.5 Explore how people safely use common information systems to meet information, communication and recreation needs</td>
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<tr>
<td></td>
<td></td>
<td>10.10 Plan and manage projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability</td>
<td>4.6 Work with others to plan the creation and communication of ideas and information including online collaborative projects, applying agreed ethical and social protocols</td>
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</table>
WELCOME!

The "Computer Science Field Guide" is an online interactive resource for high school students learning about computer science.

http://www.cosc.canterbury.ac.nz/csfieldguide
Unterrichtspraxis - Neue Portale

Umfangreiche Unterrichtsmaterial-Sammlungen (noch etwas unsortiert ...)

Eine ausgezeichnete, konsistente Sammlung informatorischer Themen und Ausarbeitungen: [http://www.inf-schule.de](http://www.inf-schule.de)

Ein weiterer Versuch, die Schulinformatik zu portalisieren
[http://www.informatik.schule-bw.de](http://www.informatik.schule-bw.de)

Hochwertige Unterrichtsmaterialien
[http://www.swiseduc.ch/informatik/](http://www.swiseduc.ch/informatik/)
[http://www.swiseduc.ch/informatik/programmiersprachen/](http://www.swiseduc.ch/informatik/programmiersprachen/)

Ein moderner Ansatz vom anderen Ende der Welt (Neuseeland), wo auch der Computer abgestoppt wurde ... (CS Unplugged)

Programmieren vom Kindergarten weg - möglich in den USA ...
[http://code.org/educate/curriculum](http://code.org/educate/curriculum)

Aktuelles Curriculum Niedersachsen
[http://db2.nibis.de/1db/cuyo/datei/kc_informatik_sek_i.pdf](http://db2.nibis.de/1db/cuyo/datei/kc_informatik_sek_i.pdf)

Mehr Theorie als Praxis - Blick auf die Schulinformatik

Tagungsbände der INFOS 2013 in Kiel
(diesmal leider ohne österreichische Beteiligung)
[http://www.infos2013.uni-kiel.de/?page_id=950](http://www.infos2013.uni-kiel.de/?page_id=950)

Jubiläums-Tagungsband 25 Jahre INFOS 2009 in Berlin


[http://www.ahs-informatik.at](http://www.ahs-informatik.at)
Digitale Schule
Ein weites Feld

Manfred Spitzer
Digitale Gegenwart
Wie wir uns und unsere Kinder um den Vorstand bringen
Es ist zum .......

Interaktive Tafel!!!

LEGO!
12.000.000.000
60.000
= 200.000
Floch is besser, wie die Erde ???
Is it Computer Literacy, IT, ICT or Informatics?
What is going on in Austria’s Compulsory Schools in the Context of Educational Standards?

Peter Micheuz
peter.micheuz@uni-klu.ac.at
August 2006, University Klagenfurt
Discussing Educational Standards for Digital Competence and/or Informatics Education at Lower Secondary Level

A workshop proposal submitted to

KEYCIT - Key Competencies in Informatics and ICT

July 1-4, 2014
Potsdam, Germany

ABSTRACT

Participants of this workshop will be confronted exemplarily with a considerable inconsistency of informatics education at lower secondary level and should contribute on this issue through short and structured case studies of their countries. Until now, very few countries have been successful in implementing “computing” in this important window of opportunity of formal schooling. The spectrum from digital literacy to informatics, particularly as a discipline in its own right, has not achieved the break-through which is overdue in our digital society. The goal of this workshop is not only to discuss the anamnese and diagnosis of this highly fragmented field but to discuss and suggest viable forms of therapy. Making visible good practices in some countries and comparing successful approaches are rewarding tasks for this workshop. Thinking of and defining common educational standards for the age-group of 14/15 years old students in a readable and assessible form, should keep the participants of this workshop active beyond the limited time at the conference.
STRUCTURE OF THE WORKSHOP

1) DISCUSSING TERMINOLOGY

<table>
<thead>
<tr>
<th>Field</th>
<th>Level of Proficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital, Media</td>
<td>Skills, Literacy, Fitness, Fluency</td>
</tr>
<tr>
<td>IT, ICT</td>
<td>Knowledge, Qualification</td>
</tr>
<tr>
<td>Computer, Computing</td>
<td>Competence, Pedagogy</td>
</tr>
<tr>
<td>Informatics, Computer Science</td>
<td>Education</td>
</tr>
</tbody>
</table>

Among many meaningful combinations from digital skills to computer science education digital competence and informatics education seem to be are prevalent. A short discussion about informatics and its Anglo-Saxon equivalent computer science is appreciated.

2) OVERVIEW OF FRAMEWORKS

DIGITAL COMPETENCE AS A KEY COMPETENCE

The seminal European Reference Framework for Key Competences for Lifelong Learning consists of the key competences communication in the mother tongue, communication in foreign languages, mathematical competence and basic competences in science and technology, digital competence, learning to learn, social and civic competences, sense of initiative and entrepreneurship and cultural awareness and expression.

The current DIGCOMP project goes beyond this definition and proposes a framework “for all citizens” in our increasingly digitalised society. But has it the potential to serve as an important reference model like the prominent and influential Common European Framework for Foreign Languages? It comprises the main competence areas information, communication, content-creation, safety and problem-solving with each area consisting of 3-6 competences and the proficiency levels A (foundation), B (intermediate) and C (advanced).
### Fuzzy Terminology, an international issue!

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Levels</th>
</tr>
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<tbody>
<tr>
<td>Digital, Media</td>
<td>Skills, Literacy, Fitness</td>
</tr>
<tr>
<td>Computer, E(Electronic)</td>
<td>Fluency, Knowledge, Qualification</td>
</tr>
<tr>
<td>IT, ICT, Informatics</td>
<td>Competence, Pedagogy Education</td>
</tr>
</tbody>
</table>

**Combinations of „Plastic“ Terms**

- Media Literacy
- ICT Competence
- IT Fluency
- E-Pedagogy
- Computer Fitness
- IT Knowledge
- Informatics Education
- Digital Skills
3) DISCUSSING A COMPREHENSIVE COMPETENCE MODEL

As a common denominator of many regional, national and international curricula and frameworks, the following competence model can be seen as a starting point and compromise of core informatics and interdisciplinary media education. It can be applied to all stages of school level and can serve as a solid fundament and a preliminary stage for further informatics and ICT teaching at upper secondary level.

<table>
<thead>
<tr>
<th>Content</th>
<th>Knowing Understanding</th>
<th>Applying Designing</th>
<th>Reflecting Evaluating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Media Reflection Related Topics</strong></td>
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<tr>
<td>Information Technology, Human and Society</td>
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<td>Impact of IT in Society</td>
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<td>Responsibility in Using IT</td>
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<td>Privacy and Data Security</td>
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<td>Developments and Vocational Perspectives</td>
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<td><strong>Informatics Systems</strong></td>
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<td>Technical Components and their Use</td>
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<td>Design and Use of Personal Information Systems</td>
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<td>Data Exchange in Networks</td>
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A Pragmatic (not sophisticated ...) Competence Model for **Vocational Schools** in Austria (grades 9-13)

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Competence Model for Informatics Education in Austria’s **Upper Secondary Level in General Education (Gymnasium)**
ICT in Primary Education: Transforming children’s learning across the curriculum

Why and how are teachers integrating ICT (Information and Communication Technology) into primary education? In this course we analyse examples from schools in different parts of the world, and bring professional teachers, headteachers and policymakers together to share their best ideas and inspiring stories. The materials in the course are based on studies carried out for the UNESCO Institute of IT in Education, Moscow.

About the Course

Teachers and policymakers working in all sectors of education now recognise the importance and value of technology for learning and teaching. The Institute of Education, University of London (IOE http://www.ioe.ac.uk/) and the UNESCO Institute for IT in Education (ITE http://ite.unesco.org/) are collaborating to run this professional development course for teachers, headteachers and policymakers working in the Primary Education sector.

The course is part of ITE’s role to support and promote an active community of practitioners and policymakers in the use of digital technologies for learning and teaching.

Sessions

May 27th 2014

Course at a Glance

- 6 weeks
- 4-10 hours of work/week
- English
- English subtitles

Moocs made in Austria

VON ERIKA PICHLER


Jüngster Mooc Österreichs

man sich ebenfalls mit dem Thema Moocs beschäftigt.


Best of Informatikunterricht

"Die Informatiklehrenden sind untereinander wenig vernetzt und haben kaum eine Lobby." So sei die Idee entstanden, für die rund 500 Lehrer, die im kommenden Schuljahr in den AHS-Klassen der neunten Schulstufe den Pflichtgegenstand Informatik unterrichten, eine Mooc-Struktur aufzubauen. "Das Know-how vor allem der erfahreneren Lehrenden aus 20 bis 30 Jah-


Die technische Plattform für das Informatik-Mooc wird von der
Hoppala, was augelassen?
SCHLUSS