Is it Computer Literacy, IT, ICT or Informatics? What is going on in Austria's Compulsory Schools in the Context of Educational Standards?

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Austria – the ♥ of Europe

ICT/Informatics – objectives in schools all over Europe ...

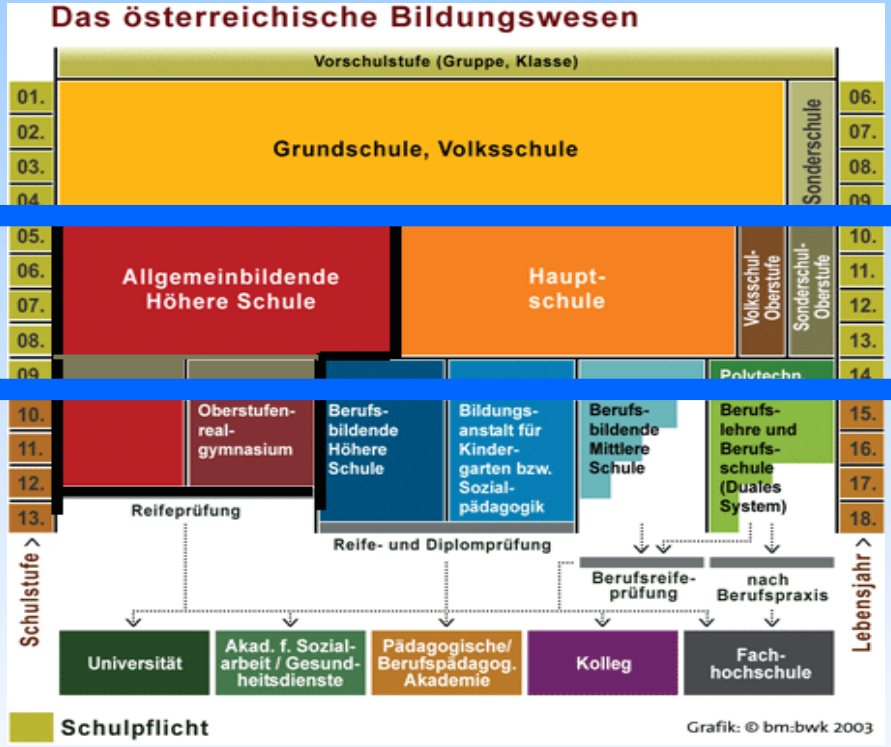
Learning standard software, the search for information, communicating via internet, using ICT to enhance subject knowledge and **developing „programming skills“**

… but the subject „Informatics“ is common only in very few countries

Results of the autonomy

Upper secondary level	12th grade	Informatics as an elective course	Informatics as a compulsory subject in the framework of autonomic decisions	E-Learning initiatives, integration of the computer in other subjects	No informatics
	11th grade				
	10th grade				
	9th grade	Informatics for all pupils (compulsory curriculum)			
Lower secondary level	8th grade	Non obligatory Introduction into Informatics	Informatics as a compulsory subject in the framework of autonomic decisions	E-Learning initiatives, integration of the computer in other subjects	No Informatics
	7th grade				
	6th grade				
	5th grade				

The Austrian School System



About 1.200.000 pupils/students in Austria's very different school system, about 120.000 teachers

Lower secondary level (grades 5-8, age 10-14/15)

Is ist ICT?

Higher secondary level (grades 9-12/13)

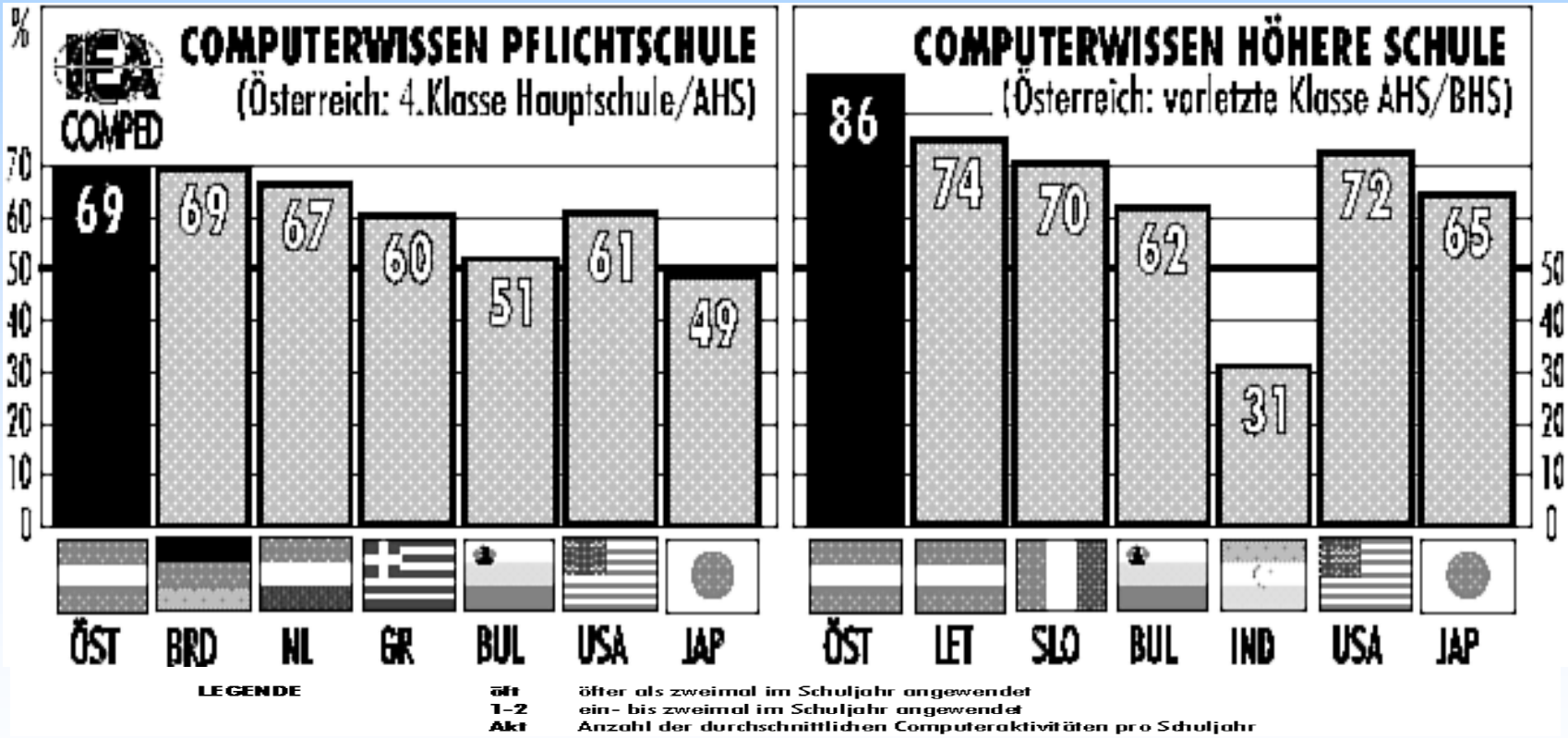
Is IT Informatics?

Due to reinforced autonomic develepments (since 1995), we have very little qualitative information about what is really going on in ICT/Informatics lessons.

A look into the glory past …

Worldwide COMPED Study 1992

Testing of „computer knowledge and skills“



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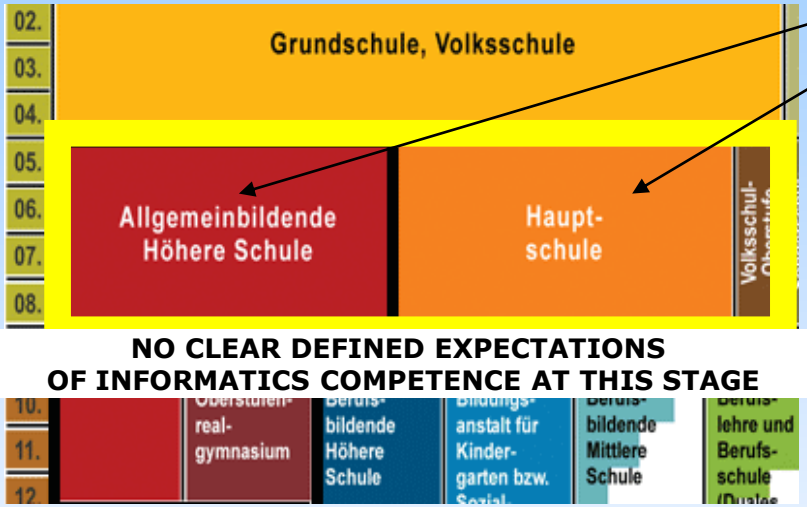


NO CLEAR DEFINED EXPECTATIONS OF INFORMATICS COMPETENCE AT THIS STAGE

„PATCHWORK"

of a wide range of
additional courses
and
obligatory lessons in
Informatics

[due to **bottom up initiatives**,
caused by **competition**
among schools]

Is tolerable that pupils at the transition from lower to upper secondary level have not consumed one single hour of IT/Informatics instruction and lessons?

1995 – the big shift of paradigm

Partly Deregulation and Autonomy at Austrian Schools

The Remarkable Year 1999

New Curricula for the Lower Secondary Level! But IT/Informatics stayed a „poor cousin“!

New Curricula I

The only hints in the curriculum can be summarized as follows:

"Innovative technologies are gaining more importance in our lives (...). Within the scope of education ICT has to take this development into account. Moreover the didactic potential (...) has to be utilized."

New Curricula II

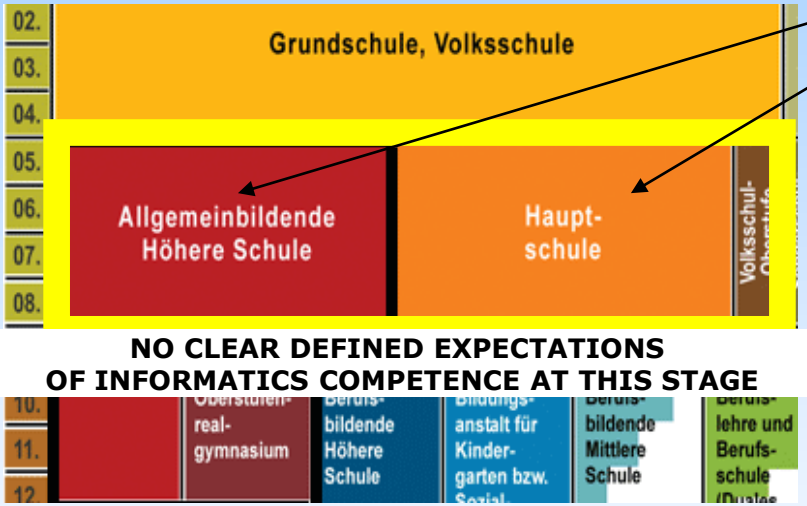
Additionally ICT can be found as an educational principle, a recommendation with more or less obligation, expressed in one sentence:

“In the educational process new technologies should be applied.” respectively in some remarks of curricula for core subjects in which “IT should be used”.

5 Recommendations from the Ministry of Ed.

- **Autonomy** of schools to alter timetables and introduce **new subjects**
- **New (core) curricula (no Informatics!)**
- Shift input orientation -> **output measuring**
- Establishment of **educational standards**
- Offering and supporting the **ECDL** (IT-certificates)

Results of the Autonomy



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Why IT at lower secondary level?

Five basic cultural tools … **(Baumert, 2003)**

- **Mastering of the common language**
- **Applying mathematical modeling**
- **being competent one/two foreign language(s)**
- **the self regulation of acquisition of knowledge**
- **and last but not least IT- competencies**

Remarks on IT,computer science and informatics

We have severe problems with a well-founded and scientifically proven terminology:

- **What is the difference between ICT and Informatics**?

I,C,T is a definitely a subset of **I**,N,F,O,R,M,A,**T**,I,**C**,S (JOKE!)

IT = ICT?

IT <> informatics?

ICT - computer science?

computer science = informatics?

Trying to clarify the dichotomy

IT/ICT	Informatics
specific education	general education
concrete, practical	abstract, theoretical
application oriented	fundamental, basal instruction
training	education
technical schooling, courses	class lessons
certificates	school reports
product knowledge	conceptual knowledge
short term learning	sustainability
instantly available knowledge	general knowledge
using software	modeling and developing software
applying software	reflecting the use of Informatics
systems competencies, skills	knowledge, comprehension
executing tasks	problem solving

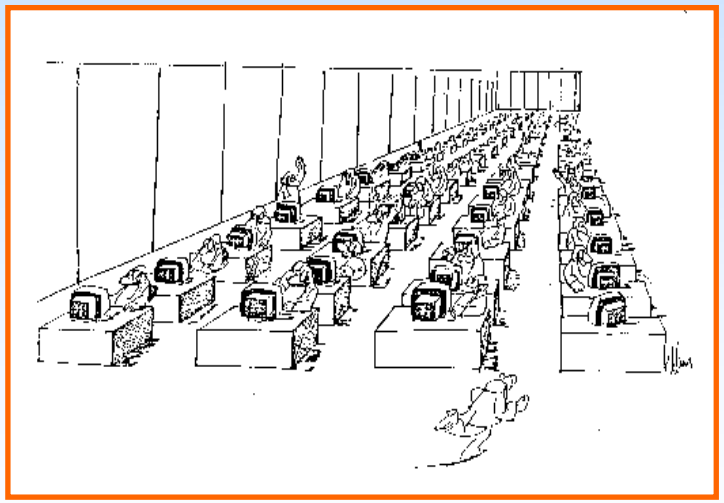
Educational Standards (I)

Why?
Input orientation is out! Curricula are ineffective!

The magic word is: Standards

before the introduction of standards …

… and after ;-)



Wishful thinking and desirable development?

Educational Standards (II)

Austria is about to introduce „educational standards“ in some subjects as German, English, Math and ….. IT or Informatics?

The (Stony) Way to Standards in Informatics I

IT/Informatics education also needs a solid and consistant development with generous stages of exercising and consolidation

There is a need for

a framework of appropriate objectives for each level and for formal Informatics instruction

to achieve

„Educational Standards“

also in Informatics (or is ist IT?)

The (Stony) Way to Standards in Informatics II

„**Educational standards** (...) draw on **general educational goals.** They specify the **competencies** that schools must impart to their students in order to achieve certain **key educational goals**, and the competencies that children or teenagers are expected to have acquired **by a particular grade**. These competencies are described in such specific terms that they can be translated into particular tasks and, in principle, **assessed by tests**."

[Klieme, E. et al.,The Development of National Educational Standards, 2004, p.15]

Standardizing the Educational Standards

Will it be the ECDL? **NO!**

There is an (informal) working group in Austria (and other countries …) developing Educational Standards for the end of the lower secondary level.

The task/problem is international and global!

Standardizing the Educational Standards

A first **Austrian** Approach

- Informatics Systems and Social Aspects
- Applications and Publishing
- Problem solving and Modeling
- Learning

The **German** Approach (modeled on NCTM-Standard)

- Information and Data
- Algorithms (**me** involved)
- Informatics and Social Aspects
- Informatics Systems – Design and Functionality
- Languages and Automatons

Standardizing the Educational Standards

The FITness program (USA) is based on three knowledge levels which have been recognized as important for coping with IT [FITness Being Fluent with IT, http://www.big6.com]

- Intellectual capabilities

  - having the ability to solve problems by reasoning, test possible solutions, anticipate and adapt to change, and troubleshoot.

- Fundamental concepts

  - knowing about computers and information systems, being aware of how they work and how they impact society.

- Contemporary skills

  - being able to manage a personal computer and use common software applications such as e-mail, word processing, spreadsheets, and databases.

Global frameworks and approaches

One example ("pars pro toto")
UNESCO/ IFIP

Their Framework is based on the definition of
"ICT by methods of Informatics".

"Informatics" is the "science" dealing with
design, realization, evaluation, use, and maintenance
of information processing systems
including hardware, software,
organizational and human aspects,
and the industrial, commercial, governmental
and political implications of these".

Need for a framework and standards

- The „digital gap” in Austria is still undesirably wide at lower secondary level
- There is a need for a reasonable framework which ensures a certain level of e-literacy
- Students leaving a lower secondary level should prove a reasonable standard in IT/informatics competence
- A core curriculum and **educational standards** for the lower secondary level are of high concern
- Standardizing the terminology would be a worthwhile global task.

Completing conclusions

- Offer of ICT/Informatics in lower secondary level **differs extremely** from school to school – due to autonomy

- IT-knowledge and informatical competencies of pupils also!!!

- **Standardizing measures** especially up to and especially for the end of grade 8/9 (end of compulsory education) should be taken

- I suggest the **simplification of the terminology** in the context of **ICT** and **Informatics**.
  Mathematics in schools covers the range from primitive calculating to abstract proving.
  Why shouldn‘t the subject **„Informatics“** stand for elementary ICT-competencies as well as for higher issues of „pure Informatics“

The (ab)normal case after 8 years school

There is only one thing left, I want to mention...

Thank you for your attention!

And I do expect questions and critical remarks ...