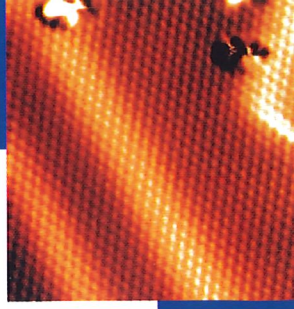

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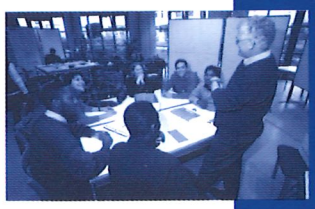


Open IFIP-GI-Conference on Social, Ethical and Cognitive Issues of Informatics and ICT (Information and Communication Technology)

July 22-26, 2002
University of Dortmund

e-learning
media education
change management

IFIP
INTERNATIONAL FEDERATION FOR INFORMATION PROCESSING

GI

Sun microsystems
take it to the nth

IBM

PRO DV Software AG

UNIVERSITÄT DORTMUND

PATRONESS

FEDERAL MINISTER OF EDUCATION AND RESEARCH, EDELGARD BULMAHN

Information and communication technologies increasingly enter all industrial and service sectors – not only in Germany but worldwide. The rapid development has led to a large supply of highly qualified jobs and a shortage of skilled manpower. We are all facing similar challenges which are reflected in the concept of the meeting: How can we support young people's, and in particular young women's, interest in studies and vocational training in IT professions? How can we create reliable systems providing effective protection against misuse, thus building trust? What contributions can collaborations between education institutions and industry make? How can we make sure that the potential of information and communication technologies will benefit all; how can we prevent a divide between an "information elite" on the one hand and the less informed people on the other?

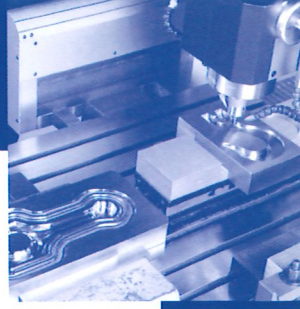
Each country will have to find its own solutions. In its action programme "Innovation and Jobs in the Information Society of the 21st Century", the Federal Government in 2000 defined its goals and funding priorities. Initial measures have been taken by launching the "Green Card Initiative" and an emergency programme to develop further computer science studies at German higher education institutions.

I am confident that this meeting will provide us with new ideas and that the presentations of best practices for computer science education concepts will help us to move ahead.

E. Bulmahn

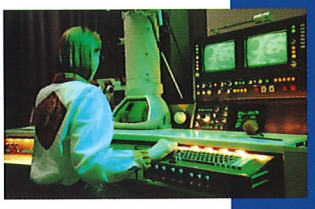
Edelgard Bulmahn

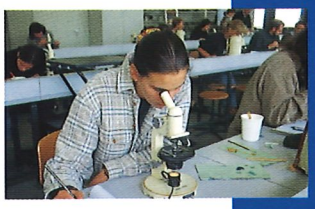
Federal Minister
of Education and Research

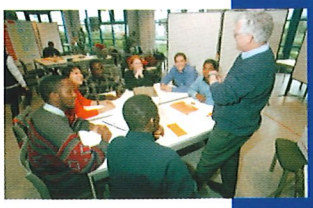


SEC III DORTMUND
JULY 22-26, 2002

AIM OF THE CONFERENCE AND TARGET GROUPS







The international conference on "Social, ethical and cognitive issues of informatics and ICT (information and communication technology) - SECIII" is concerned with the interplay of the new technologies and society. Methodologies and strategies which will help to realize the potential of information and communication technology (informatics, computer science and ICT) in education, business and commerce will be identified and discussed. The major themes, which have to be considered in relation to computer science, focus on four main areas:

- The e-literate society – the role of informatics, computer science and ICT
- ICT – agent of change and social conflict
- E-learning – meeting the challenge of technology on society through new partnerships
- Paradigm shifts in education and professional life

The conference provides a forum for

- Teachers
- Trainers
- Lecturers
- Curriculum Developers
- Informatics Experts
- Software and Hardware Specialists
- Policy Makers and
- Learners

from business and education.

SECIII is an IFIP event organized by the Gesellschaft für Informatik e. V. and the University of Dortmund. The aim of the conference is to provide an international forum for interaction.

IFIP

IFIP has a tradition of organising exciting conferences which stimulate discussion, foster the exchange of ideas and knowledge, generate more informed understanding of and insights into other cultures and promote awareness of developments in all aspects of information processing in education. This conference aims to provide an international forum for such interaction on the social, ethical and cognitive issues of informatics and ICT in education.

Thus, it is concerned with the interplay of new technologies and society. In these discussions we aim to identify methodologies and strategies that will help to realize the potential of information and communication technology (Informatics, Computer Science and ICT) in education, business and commerce.

IFIP conferences are also social and networking occasions. There will be a number of social activities arranged around the formal conference programme, starting with registration and a welcoming gathering on the evening of July, 21st, 2002, designed to provide opportunity for attendees to meet others in informal settings.

The conference will be held on the modern and large campus of the university of Dortmund. The campus, located in the immediate neighbourhood of Germany's most successful technology park, provides an ideal place for living, studying and working. A large number of new and modern housing facilities, the suburbs Barop and Eichlinghofen, the research institutes and the high-tech companies provide a challenging and creative atmosphere.

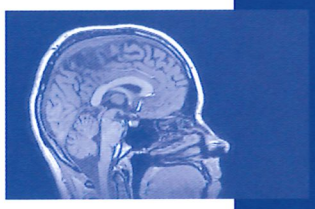
The International Federation for Information Processing (IFIP) is a multinational federation of professional and technical organisations concerned with information processing.
Its secretariat is located at Hofstrasse 3, A-2361 Laxenburg, Austria.

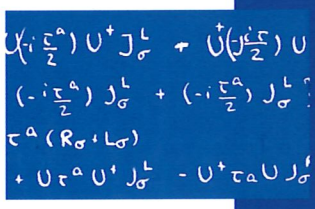
CONFERENCE THEMES

Reflecting the purpose of the conference outlines above, the major themes focus on four areas.

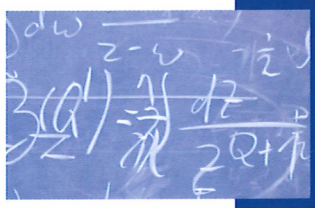
The e-literate society – the role of informatics, computer science and ICT
Everybody should be taught, should know and should understand key principles and acquire a range of transferable skills, which would help them to use the technologies of today as well as the technologies of the future. This demands a consideration of many of equity issues, e.g. access to technology and information, equal opportunities for men and women, disadvantaged groups, loss of cultural richness and diversity. What role could the educational system play in determining the knowledge and skills, and creating a more equitable society? What criteria should be developed to measure and evaluate success in this field?

ICT – agent of change and social conflict
The rapid development of ICT has led to many conflicts in society and sharpened specific issues: unemployment, differential access to information, cyber crime, the generation gap, north-south divide. On the other hand it offers promising perspectives: ICT has dramatically transformed our daily life and work, new professions are emerging, new economic frameworks are developing. New educational initiatives such as life long learning and multimedia have been formulated. Should education be making students aware of these issues and exploring ways in which they could be resolved? How can education increase social responsibility and integrate it into normal curriculum? Will society have to accept crime (e.g. in the internet), social disorder and disadvantage spawned by ICT? How can education of computer scientists produce ´socially literate´ persons? Can the agent of change and social conflict be harnessed to resolve these problems?



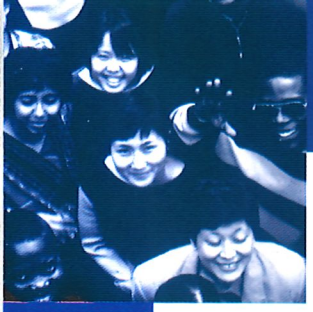


E-learning – meeting the challenge of technology on society through new partnerships
Educators, teachers, trainers and their students are expected to use ICT in more imaginative ways in all aspects of teaching and learning. In facing up to this, new partnerships are being established e.g. between schools and industry (in creating courseware and teaching-modules), between different educational institutions (in developing online-courses) between local social groups to engage persons currently outside the computer community, and across communities often separated by substantial real distances. In all cases e-learning offers the potential of new experiences to education and poses the challenge of developing new tools like authoring systems, intelligent tutor agents and cooperative and collaborative learning environments to realize the potential of ICT.



Paradigms shift in education and professional life
New technologies offer new possibilities for teaching. Education is exploring a new paradigm to accommodate the technologies and these possibilities. However such a new paradigm should help to integrate the impact of technology on society. But generally educators are not well prepared or motivated to explore issues associated with law, ethics or media education. What tools, what content, what experiences and what resources should be designed and drawn upon to help shape the new paradigm of didactics of Informatics and ICT studies and use? What concepts should be adopted?

The keyword list, provided on page 9 in this brochure, supports these themes, and gives an indication to authors and attendees of the range of coverage we expect.



CONFERENCE ACTIVITIES

The conference activities will be built around three substantive parts:

- material selected from submissions to the programme committee and others,
- particular invitations and contributions volunteered,
- and most importantly, the active participation and contribution of all attendees.

Thus this conference will be much more than simply five days of paper presentations; our aim is to devise a conference that will be lively and actively engage all participants.

Note:

The official language of the conference is English. Internet and e-mail access are available.

1 Keynote addresses

The programme committee will invite a few individuals to present keynote addresses to stimulate and challenge the attendees.

2 Paper sessions

Papers should address one or more of the conference themes. They should be research and reflection oriented and may be descriptions of major innovative projects. The papers should stimulate the audience to explore the main topics of this SECIII conference in greater depth. Presenters will have a limited allocation of time which will allow for presentation and discussion.

3 Provocative paper sessions

These are short presentations, which deal with contentious issues and are designed to trigger vigorous debates.

4 Active lecture rooms / classrooms

The organizer will present innovative projects integrating ICT in learning and teaching activities. These short, active classroom sessions should engage participants in collaborative working, telelearning and online learning material. Each active classroom will be allocated 45 minutes. These sessions are not intended to be a promotion for commercial software.

5 Case studies

This is an ideal opportunity to briefly present and debate a project. The presentation of the case study should describe situations, analyse them and explain reasons for their development and then encourage intensive discussion. Each case study will be allocated 45 minutes.

6 Focused debates

Each discussion session focuses on specific topics. Three or four presenters, from different countries and/or different backgrounds (business, education, research) will briefly illustrate their main ideas. Then the chair will invite the audience to react and exchange various points of view. Each discussion session will be allocated 45 minutes. At the end of the session a one-page summary of the debate will be produced.

7 Creative exchange sessions

This offers the opportunity to present your latest research results, your best experiments, practice that you are proud of, challenges and issues. The creative exchange should be summarized on one page, and sent to the programme committee. Each presenter will be allocated 3 minutes, 3 items for discussion and should identify 3 potential questions.

8 Real-time, real-life sessions

What is new in education, in industry, business and commerce? These presentations of innovative ICT use/solutions may be integrated with a visit – real or virtual! Each session will be allocated 45 minutes.

9 Exhibitions

9.1 Demonstrations

A demonstration will focus on educational software, multimedia materials, innovative websites, e-learning environments. Presenters will demonstrate and explain how to use it in teaching and learning activities.

9.2 Market place / sponsors

New and innovative hardware and software of interest to the audience can be presented.

HOW TO SUBMIT TO CONTRIBUTIONS

Please send your contribution to Sigrid Schubert by October 31st, 2001 (only per email to SECIII@cs.uni-dortmund.de). All contributions will be reviewed. You will be informed of the outcome of this review process by February 10th, 2002.

For all submissions there are common requirements

Please create and construct your contribution in the following way:

- Put the type of contribution (paper, provocative paper, case study etc.) and the suggested theme the material addresses in the upper right corner of the first page.
- Then add
  - the title and the author(s) name, affiliation, address, country, telephone, fax, email and web address; centred on this page.
  - the heading *Keywords* followed by up to five key words from the keyword list (page 9).
- In the text
  - do not number sections or paragraphs,
  - do not use footnotes,
  - number and title all tables and figures.
- Send your contribution either as an RTF-formatted file or as a Microsoft Word document.

Please add signed

1. acknowledgement that the paper has not been submitted elsewhere
2. Permission to present the paper, email and web address in the conference proceedings and on the conference web site.

Requirements for each specific type of contribution

Papers (3000 words)

- The heading *Abstract* followed by an abstract of not more than 300 words
- The total text including title, author information and abstract should not exceed 3000 words
- Tables and Figures should be added at the end of the document and should not exceed 2 pages
- Avoid using more than 12 references

Provocative papers (1000 words)

- The heading *Abstract* followed by an abstract of not more than 150 words
- The total text including title, author information and abstract should not exceed 1000 words
- Tables and Figures should be added at the end of the document and should not exceed 1 page
- Avoid using more than 6 references

Active classrooms

- The heading *Abstract* followed by an abstract of the activity of not more than 150 words
- The heading *Relevance* followed by a description of why this classroom is relevant to this conference
- The heading *Target groups* followed by a selection from the target groups (page 3)
- The heading *Presentation* followed by one or more paragraphs describing how you will involve participants in the classroom
- The heading *Outcome* followed by a description of the learning outcome for classroom participants
- A brief statement naming the material to be used and the facilities involved
- The total text including title, author information and abstract should not exceed 1000 words

Case studies

- The heading *Abstract* followed by an abstract of not more than 300 words
- The heading *Relevance* followed by a description of why this case study is relevant to this conference
- The heading *Target groups* followed by a selection from the target groups (page 3)
- The heading *Presentation* followed by a description of how you will involve participants in a discussion of your contribution
- The heading *What is in it for conference participants* followed by a paragraph describing the benefit for individual conference participants that will follow from attending your presentation
- The total text including title, author information and abstract should not exceed 1000 words
- Tables and Figures should be included in the text and should not exceed 1 page
- Avoid using more than 6 references

Focused debate

- The heading *Topic* followed by a sentence outlining the topic
- The heading *Abstract* followed by an abstract of not more than 150 words
- The heading *Relevance* followed by a description of why this issue is relevant to this conference
- The heading *Debate* followed by one or more paragraphs outlining who else would be a good member of the debating panel, and the country, area they would represent. This is the opportunity for you to propose a team, who you have negotiated with, to take part
- The total text including title, author information and abstract should not exceed 1000 words

Creative exchange sessions

- The heading *The idea f*ollowed by a description of the particular area you wish to exchange
- The heading *Discussion*, followed by up to three areas for discussion
- The heading *Questions*, followed by up to three questions you want to raise
- The total text including title, author information and text should not exceed 500 words

Real-time, real-life sessions

- The heading *The idea* followed by a description of the particular visit you wish to arrange
- The heading *New* followed by a paragraph explaining the nature of the innovation

SELECTION PROCESS AND PUBLICATION

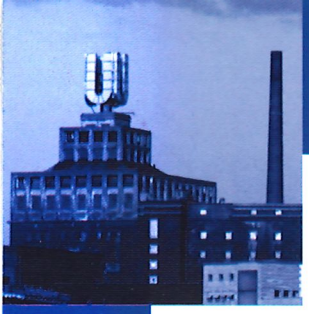
Contributions will be reviewed for appropriateness to the conference and the calibre of the material. The programme committee will meet to consider the recommendations made by the reviewers and select contributions. You will be informed of the outcome of the selection process by February 10th, 2002.

All selected contributions will be published in the conference proceedings that will be available to all participants at the start of the conference.

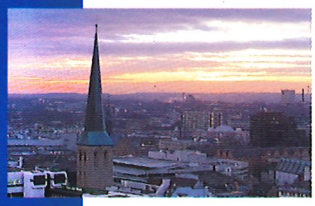
A subset of selected contributions will also appear in a book, published after the conference, by Kluwer Academic Publishers. The editors of this book will contact selected authors with instructions for manuscript preparation.

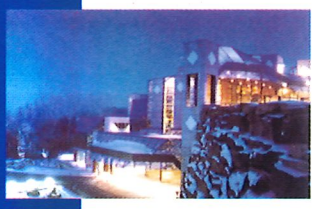
SECIII KEYWORD LIST

Accreditation
Adaptation
Administration
Algorithms
Assessment
Age
Agent of Change
Authoring Systems
Basic Concepts
Barriers
Building Design/Redesign
Business Competencies
Case Studies
Catalyst for Adaptation/
Change Management
Citizenship
Classroom
Teaching/Practice
Cognition
Collaborative Learning
Communication
Competencies
Computer Assisted Instruction
Computer Science
Computing
Control of Privacy
Creativity
Critical
Culture
Curriculum Changes
Curriculum Policies
Cyber Crime
Cyber Law
Cyber Surveillance
Cyber Economics
Cyber Security
Decentralization
Developing Countries
Development
Didactical Modeling
Didactics of Computing
Didactics of Informatics
Digital Divide
Disability
Distance Learning
Economy
Education
e-learning
e-literacy
Electronic Business
Electronic Communication
Electronic Learning
Empowering
Equity
Ethical/Ethics
Evaluation
Experimental
Freedom
Future
Games
Gender
Globalisation
Government
Higher Education
Home Learning
ICT (information and
communication
technologies)
Identity
Imported culture
Industry Training
Informatics
Innovation
In-Service Training
Integrity
Intellectual property
Interdisciplinary
Internet
Intranet
Isolation
Justice
Knowledge Management
Law
Learner-Centred-Learning
Learning Environments
Learning Materials
Learning Models
Lifelong Learning/Education
Literacy
Motivation
Media Education
Networks
Open Flexible Learning
Open Learning Systems
Opportunities
Parents
Partnership
Pedagogy
Policy Makers
Pornography
Power Shift
Problem Solving
Programming
Quality
Research
Responsibility
Risks
Recommendations
Rules
Secondary Education
Security
Self-Assessment
Social Issues
Society
Special Needs
Standards
Students
Teacher
Teacher Education
Teacher Training
Teaching Methods
Teaching Materials
Teamwork
Tele-Teaching
Trainer
Tutor
Values
Virtual Classroom
Virtual Reality
Virtual University
Vocational Education



RUHRGEBIET.
FROM INDUSTRY TO INFORMATION





The Rhine Ruhr area or *Ruhrgebiet*, once the industrial heart of Germany, now offers one of the densest concentrations of educational and cultural institutions in Europe. Seven universities and three universities of applied sciences are concentrated between Dortmund and Düsseldorf. There are more museums, theatres, opera houses, sport events, rock concerts, ballet performances, and discotheques than anywhere else in Germany. Per year, more than 10,000 cultural events take place.

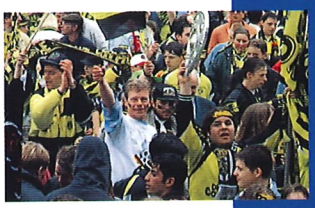
Musical?	Visit Andrew Lloyd Webber´s *Starlight Express* in Bochum
Art?	Admire the "art collection" North Rhine Westfalia in Düsseldorf
Performance?	Experience the Aalto theatre in Essen
Football?	Cheer with Borussia Dortmund or Schalke 04 in their world-class stadiums
Snowboarding?	Try the all year indoor ski arena in Bottrop
Shopping?	Take your credit card to the Königsallee in Düsseldorf
Gambling?	Good luck in the Casino Hohensyburg in Dortmund!
Industrial Ages?	Take the lid of the *Pott* – tour the Ruhr
Medieval Ages?	Climb the tower of the cathedral in Cologne
Castles?	Bicycle the water castle tour in the Münsterland
Nature?	Hike in the *land of 700 hills* Sauerland
	You name it – you´ll find it!

In addition to the scientific program, the conference participants will be offered tours and visits to cultural sites and events in the area. Registration will be on an individual basis.

DORTMUND.
A GROWING LOCATION

Dortmund is the business and service industry centre of the eastern Ruhr area. A population of 600,000 and a total of eight million people living within 50 km make it to one of the centres of economic life in the metropolitan Rhine Ruhr region, one of the largest conurbations in Europe.

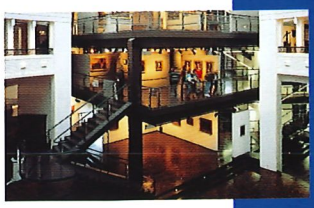
Industry in Dortmund is shaped by an abundance of small-to-medium-sized enterprises as well as a good number of large corporations – all offering innovative products and a high degree of service excellence: insurance, banking and finance, software R&D, sales and distribution, the highly innovative microsystem engineering sector and a top-performing logistics sector.



Dortmund is the *software and IT capital* of North Rhine-Westphalia, Germany's largest state with a population of 18 million people. More than 900 IT companies with about 13,000 employees are located in the area with both numbers growing rapidly. Dortmund has a combination of first-class educational institutions and an attractive labour market. The University of Dortmund is home of Germany's largest department of computer science. Include the University of Applied Sciences in Dortmund and you have a total of 4,500 future IT specialists currently studying in Dortmund.

Dortmund is pursuing this emphasis on growth areas single-mindedly. The dortmund project is a unique municipal concept aimed at developing and establishing an internationally competitive location. By focusing on the promotion of the new anchor industries in Dortmund — IT, e-commerce, microsystem engineering and e-logistics — Dortmund is creating numerous jobs. The dortmund project pools corporate, academic, scientific, political and social resources into a powerful network of public private partnership.

Surrounded by woodland and parks and close to 50% of its area green, Dortmund is the living contradiction of the old hackneyed "black country" cliché. It has excellent housing facilities, varied shopping possibilities, a broad range of cultural, recreational and sporting activities: events with that unmistakable special flair are the concerts and exhibitions in the Westphalia Halls or any home game with premier league football club Borussia Dortmund. Dortmund has a lot to offer for everyone.



Whatever the activity, it is based on the economic foundations of a city that is continuously and positively developing itself.

Conference Chair

Sigrid Schubert

International Programme Committee chair

Deryn Watson

International Programme Committee

Yvonne Büttner (Genéve, CH)
Volker Claus (Stuttgart, D)
Helene Godinet (Lyon, F)
Raymond Morel (Genéve, CH)
Robert Munro (Glasgow, UK)
Sigrid Schubert (Dortmund, D)
Deryn Watson (London, UK), chair
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Raul Wazlawick (Santa Catarina, BR)

National Organising Committee

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Hans Decker (Dortmund)
Hans-Ulrich Dönhoff (Düsseldorf)
Burkhard Igel (Essen)
Johannes Magenheim (Paderborn)
Sigrid Schubert (Dortmund), chair
Wolfgang Weber (Soest)

Conference Secretariat

SECIII 2002
University of Dortmund
Fachbereich Informatik
Informatik XII
Otto-Hahn Strasse 16
D-44221 Dortmund
Germany

Contact: Prof. Dr. Sigrid Schubert

E-Mail: SECIII@cs.uni-dortmund.de
http://seciii.cs.uni-dortmund.de

SEC III
Social, ethical and cognitive issues of informatics and ICT

TITLE . . . . . LAST NAME . . . . .

FIRST NAME . . . . .

INSTITUTION/COMPANY NAME . . . . .

ADDRESS . . . . . CITY . . . . .

STATE/COUNTRY . . . . . ZIP/POSTCODE . . . . .

TELEPHONE NUMBER . . . . . FAX NUMBER . . . . .

E-MAIL ADDRESS . . . . .

I AM INTERESTED IN:

- ❍ ATTENDING AS A PARTICIPANT
- ❍ SUBMITTING A PAPER
- ❍ SUBMITTING A PROVOCATIVE PAPER
- ❍ PRESENTING AN ACTIVE CLASSROOM SESSION
- ❍ PRESENTING A CASE STUDY
- ❍ INITIATING AND COORDINATING A FOCUSED DEBATE
- ❍ PRESENTING A CREATIVE EXCHANGE SESSION
- ❍ PRESENTING A REAL-TIME REAL-LIFE SESSION
- ❍ GIVING A DEMONSTRATION
- ❍ EXHIBITING AT THE MARKETPLACE

PLEASE RETURN THIS TO

Prof. Dr. Sigrid Schubert
SECIII 2002, Informatik XII
Fachbereich Informatik
University of Dortmund
D-44221 Dortmund
Germany

www: SECIII.cs.uni-dortmund.de
E-Mail: SECIII@cs.uni-dortmund.de
Fax: (+49) 231 755 6116
Telephone: (+49) 231 755 6112

Stadt Dortmund
Wirtschafts- und
Beschäftigungsförderung
Dortmund

dortmund-project

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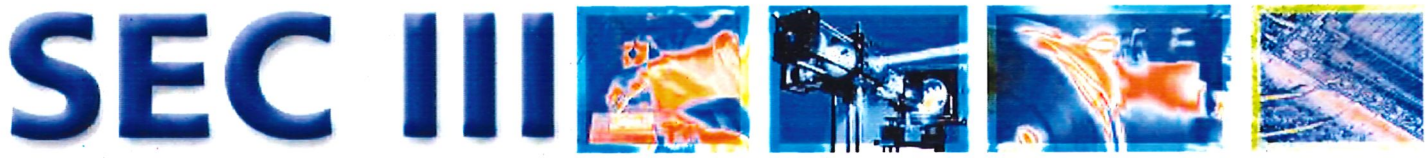

Conference
» SECIII
» Themes
» Activities
» Contributions
» Keyword list
» Programme
» Registration
» Hotel Service
» Mailing List

Location
» Directions
» University of Dortmund
» Dortmund
» Ruhrgebiet

Who?
» **Organizers**
» Patroness
» Partners
» IFIP
» dortmund-project

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Department of Informatics
Informatik XII
Otto-Hahn Strasse 16
D-44221 Dortmund
Germany

Contact: Prof. Dr. Sigrid Schubert

E-Mail: SECIII@cs.uni-dortmund.de

V. Claus, H. Godinet, Y. Buettner, S. Schubert, D. Watson, R. Munro, T. van Weert

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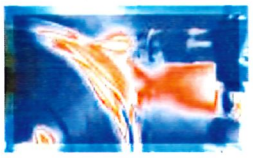

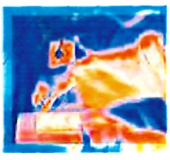

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PATRONESS

Federal Minister of Education and Research, Edelgard Bulmahn

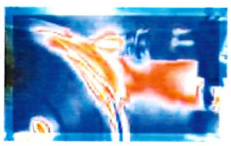
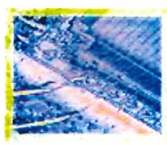
Information and communication technologies increasingly enter all industrial and service sectors — not only in Germany but worldwide. The rapid development has led to a large supply of highly qualified jobs and a shortage of skilled manpower. We are all facing similar challenges which are reflected in the concept of the meeting: How can we support young people's, and in particular young women's, interest in studies and vocational training in IT professions? How can we create reliable systems providing effective protection against misuse, thus building trust? What contributions can collaborations between education institutions and industry make? How can we make sure that the potential of information and communication technologies will benefit all; how can we prevent a divide between an "information elite" on the one hand and the less informed people on the other?

Each country will have to find its own solutions. In its action programme "Innovation and Jobs in the Information Society of the 21st Century", the Federal Government in 2000 defined its goals and funding priorities. Initial measures have been taken by launching the "Green Card Initiative" and an emergency programme to develop further computer science studies at German higher education institutions.

I am confident that this meeting will provide us with new ideas and that the presentations of best practices for computer science education concepts will help us to move ahead.

SEC III



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IFIP

IFIP has a tradition of organising exciting conferences which stimulate discussion, foster the exchange of ideas and knowledge, generate more informed understanding of and insights into other cultures and promote awareness of developments in all aspects of information processing in education. This conference aims to provide an international forum for such interaction on the social, ethical and cognitive issues of informatics and ICT in education.

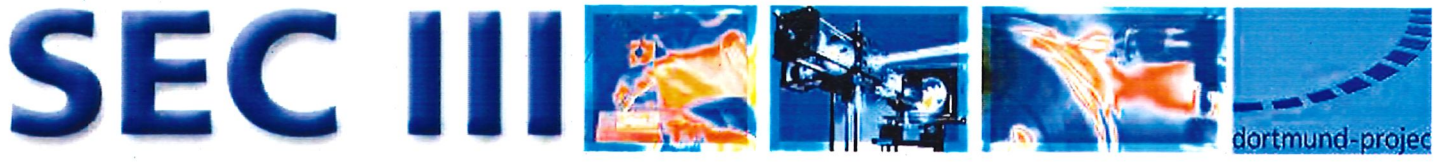
Thus, it is concerned with the interplay of new technologies and society. In these discussions we aim to identify methodologies and strategies that will help to realize the potential of information and communication technology (Informatics, Computer Science and ICT) in education, business and commerce.

IFIP conferences are also social and networking occasions. There will be a number of social activities arranged around the formal conference programme, starting with registration and a welcoming gathering on the evening of July, 21st, 2002, designed to provide opportunity for attendees to meet others in informal settings.

The conference will be held on the modern and large campus of the university of Dortmund. The campus, located in the immediate neighbourhood of Germany's most successful technology park, provides an ideal place for living, studying and working. A large number of new and modern housing facilities, the suburbs Barop and Eichlinghofen, the research institutes and the high-tech companies provide a challenging and creative atmosphere.

The International Federation for Information Processing (IFIP) is a multinational federation of professional and technical organisations concerned with information processing.

Its secretariat is located at Hofstrasse 3, A-2361 Laxenburg, Austria.



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THE "dortmund-project"

The dortmund project and its six main goals ...

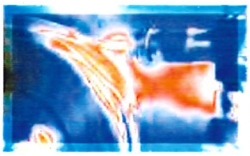
- To set up new anchor industries in Dortmund: information technology, e-commerce, microsystem engineering and e-logistics
- To strengthen companies resident in Dortmund
- To expand training programmes, skills upgrading schemes and R&D of an international standard
- To turn the City of Dortmund into a modern business city with a high quality of life and unrivalled leisure amenities
- To expedite planning and approval procedures: one-stop shopping for start-up and/or relocating companies
- To substantially boost the level of employment.

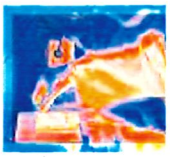
Dortmund's new raw materials are research and technological innovation. The dortmund project will support the start-up of new enterprises, the relocation of foreign companies and the growth of established core sectors via a number of selected programmes.

With the massive expansion of the number of existing study and vocational training opportunities and the promotion of R&D on an international level, Dortmund will provide exceptionally well-qualified personnel for the new economy. Dortmund has an urban development programme to match the structural transformation of the region. Five prime sites close to the city centre are available for the relocation of businesses and the construction of residential accommodation and attractive leisure facilities.

Public and private investment of well over a billion Deutschmark will set up 70,000 new jobs — 60,000 in the new anchor industries and 10,000 in existing sectors.

SEC III



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THURSDAY, 25th July 2002

9.00 - 10.00 am **Keynote**
Chair: Raul Wazlawick
Informatics - The Science of Minimal Systems with Maximal Complexity
Andreas Schwill, University of Potsdam

10.00 - 10.30 am **Break**

10.30 - 12.00 am **Paper session - Social aspects**
Chair: Yvonne Büttner

- Teaching social informatics as a knowledge project
  Iver Jackewitz, Michael Jannecke, Detlev Krause, Bernd Pape, Monique Strauss
- Using a lecturer's personal web site to enhance the social interchange among students in a academic course
  David Passig
- Potential problems of computer-mediated school education
  Glenn Russell

10.30 - 12.00 am **Paper session - Pedagogical concepts**
Chair: Johannes Magenheim

- Taking the best from real teaching environment
  Iolanda Cortelazzo
- Innovative pedagogical practices using ICT - Results of the German SITES-M2
  Rebekka Dalmer, Thomas Petzel, Renate Schulz-Zander
- Net-based distance education in the traditional university
  Paul-Thomas Kandzia

12.00 - 1.00 pm **Lunch**

1.00 - 2.30 pm **Creative exchange I**
Chair: Jane Andersen

- Facilitating critical evaluation of information on the world wide web
  Marie Iding, ThanhTruc T. Nguyen, Ariana Eichelberger, E. Barbara Klemm
- Self-guided learning in teaching mathematics at senior high school level (SelMa) - Experiences from practice
  Kristine Fankhänel, Wolfgang Weber
- Registry on public school - Using technology to serve people
  Joaquim Celestino Júnior, Marcos Clayton Pessoa

1.00 - 2.30 pm **Creative exchange II**
Chair: Ulrik Schröder

- The European information society: Social Dimension
  Panagiotes S. Anastasiades
- Re-inventing engineering education: Integrating information technology in the mathematics courses of the faculty of engineering, University of Santo Tomas
  Cristino A. Carbonell
- Animated pedagogical agent in a learning environment
  Maria Augusta S. N. Nunes, Luciane Fraga, Leandro L. Dihl, Lisiane Oliveira, Cristiane R. Woszezenki, Deise J. Francisco, Glaucio J. C. Machado, Carmen R. D. Nogueira, Maria da Glória Notargiacomo
- Science communication & the web
  Ben Kokkeler

1.00 - 2.30 pm **Sharing the IT Professions**
Chair: Burkhard Igel

- A new curriculum of higher education "IT-Professional"
  Hans-Jürgen Kottmann
- Workflow-Embedded Training in the IT-Sector
  Jörg Caumanns
- Standards and curricula for secondary IT students and teachers?
  Harriet G. Taylor

2.30 - 3.00 pm **Break**

3.00 - 5.00 pm **Paper session - Object models**
Chair: Andreas Schwill

- Exploration of object-oriented models in informatics education
  Torsten Brinda, Sigrid Schubert
- Object models of IT-Systems supporting cognitive structures in novice courses of informatics
  Peter Hubwieser
- Design pattern: A topic of the new mandatory subject informatics?
  Markus Schneider
- Development of mulitmedia animations - A contribution of informatics teaching to media studies
  Michael Weigend

3.00 - 5.00 pm **Open workshop of working group 3.1 - Informatics and ICT in secondary education**
Chair: Deryn Watson

3.00 - 5.00 pm **Open workshop of working group 3.2 - Informatics and ICT in higher education**
Chair: Tom van Weert

5.00 - 5.30 pm **Break**

5.30 - 6.30 pm **Working group discussion III**

7.00 pm Concert of the Dixie Slickers

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KEYNOTE

Thursday, 25th July 2002
9.00 - 10.00 am
Chair: Raul Wazlawick

Informatics - The Science of Minimal Systems with Maximal Complexity

Andreas Schwill, University of Potsdam

Abstract

What do the painter Yves Klein, the sculptor Richard Serra, the composer Terry Riley, the techno DJ Paul van Dyk, the Volkswagen cars and any informatician have in common? They try to get the maximum out of the the minimum, i.e. they wish to create most diverse and complex pictures, sculptures, pieces of music, artworks, collections of car models, or informatics systems out of the smallest possible reservoirs of combinators operating on few colors, shapes, notes, rhythms, car components, or basic informatics objects.

For an informatician it is a fundamental idea of computer science to search for, define, analyze, and operate with construction kits consisting of small sets of basic building blocks and a small number of operations to combine the building blocks to larger objects. While the construction kit is mostly simple, it often defines a vast and very complex field that consists of all possible objects that can be built from the building blocks by using any (finite) sequence of combinations of operators.

This idea affects and structures many areas of computer science. We present examples from several fields, among them are

- imperative, functional, and predicative programming languages,
- computable functions,
- Turing and register machines,
- Boolean functions,
- data types,
- VLSI,
- characterizations of formal languages, and
- algorithmic paradigms,

along with examples from other sciences.

How can informatics lessons profit from this observation? On the one hand, if lessons are oriented towards a fundamental idea, the idea may explain, structure, and integrate many different informatics subjects and phenomena by a single recurring scheme. On the other hand, since an idea like the construction kit principle also belongs to the sphere of everyday thinking, students already have a basic intuition of the concept which may enhance their understanding when entering any of the fields where the idea applies.

We conclude with some examples of totally inverse situations, where complicated construction kits appear in everyday life while the fields they define are more or less simple, and shortly discuss possible social consequences.

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SHARING THE IT PROFESSIONS

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Thursday, 25th July 2002

Sharing the IT Professions
1.00 - 2.30 pm
Chair: Burkhard Igel

A new curriculum of Higher Education "IT - Professional"
Hans-Jürgen Kottmann

Abstract
The IT companies in our region are in urgent need of highly qualified employees to enable them to hold their own in the rapidly growing IT markets.

The high demand for specialists and management staff cannot be covered solely by the existing higher education institutes, which are already seriously overloaded.

For this purpose, the university, the Fachhochschule, the Chamber of Industry and Commerce and the dortmund-project have founded the IT-Center Dortmund GmbH, which, as the sponsor, will develop and operate an International School for Advanced Study in Information Technologies. Once it is fully developed, the International School will provide three- and five-year courses for bachelor's and master's degrees in information technologies. Additionally a **new model course IT-Professional** has been set up which leads to an academic vocational degree within 2 years only.

Together with qualified people from industry, the teachers will be professors and academic staff from both institutes of higher education and will be responsible for the high level of the quality of training. Examinations will be held by Dortmund's institutes of higher education.

The courses are aimed at young people who have higher secondary school leaving certificates entitling them to study at a university or other (university-level) institute of higher education.

The level and the high quality of the training and continuing training courses are to be guaranteed by consistent international alignment and, as far as possible, by accreditation. A curriculum conference with members from the institutes of higher education and from industry will accompany the courses critically and pass on its recommendations for further developments.

The IT Professional courses are to

- be practice-related, demand-oriented and adaptable in their focal points,
- contain fundamental and advanced elements and, as far as possible, run parallel to employment,
- have a modular structure and provide for a credit point system,
- have a tighter time-frame than traditional German university courses,
- be increasingly enriched by multimedia methods of teaching and learning,
- be open to opportunities for distance and sandwich studies,
- be characterised by favourable teacher-student-staff ratios,
- contain practical study periods in regional companies.

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Workflow-Embedded Training in the IT-Sector
Jörg Caumanns

Abstract
The market for vocational training courses in the IT- sector is insufficiently structured and offers only a low degree of transparency for competencies and skills of employees. Thus missing quality standards and the lack of possibilities of certificated career pathes necessitated an alliance of both representatives of employers and the trade unions ('Bündnis für Arbeit') to initiate a new structure for further vocational training in this field. The new German System of vocational training presented in March 2002 is characterized by regulation and structuring. Three layers - specialists, operative and strategic professionals - offer career perspectives that can be compared to university degrees. By assigning credit points to working processes the upper layers will be comparable to bachelor and master degrees.
Part of the system is the methodology of "Working Process Based Learning (APO)" that is to be established by a close coupling to certification. Advanced vocational training will take place within the working process through ´´learning by doing´´. Knowledge and competencies are highly project-oriented and mainly acquired through informal learning strategies. The basic concept aims at developing self-learning strategies and impart the fundamentals of information technology. With these capabilities an IT specialist is able to keep up with the technical progress.
APO is work-integrated and based on business processes that were developed in collaboration with industry partners and educational institutes. These reference projects are schemes for instructive and full-scale work assignments and projects for the purpose of further education. With the help of the reference project, trainers, coaches and participants of a vocational training course will be able to find new and individual work and learning assignments within their company that fit into a certain vocational profile.

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Standards and curricula for secondary IT students and teachers?

Harriet G. Taylor

Abstract
During the past two decades, computer science has become firmly established in the secondary schools in the United States. The secondary curricula and teacher preparation needed to support the curricula has changed dramatically over the same period. There is still a great deal of variation within the United States as to what computer science content is taught at the secondary level and who teaches it. Several national initiatives have provided standards for both secondary curricula and teacher preparation. This presentation will discuss the two major initiatives currently underway to update the curricula and the teacher standards within the United States.

In the United States, the National Council for the Accreditation of Teacher Education (NCATE) accredits teacher preparation programs. NCATE reviews the general education program at each institution as well as specialty programs, such as those preparing secondary computer science educators. For the content areas, NCATE relies on recognized professional societies to develop standards for programs to certify teachers in the associated content area. In 1990, the International Society for Technology in Education (ISTE) affiliated with NCATE. ISTE (www.iste.org) became the organization responsible for technology specialty teacher preparation programs, including computer science education. Subsequently two programs were developed and approved by NCATE..

The NCATE computer science education standards (http://www.iste.org/standards/ncate/comped.html) must be reviewed and updated every five years. Currently, a process is underway for the second major revision. A team has suggested some rather broad changes and is now in the process of finalizing the recommendation. The proposed modified standards may be viewed online (http://cnets.iste.org/ncate/scs_feedback.html). The NCATE computer science standards focus on computer science as an academic area and the teaching of computer science. They are content standards and modeled after other content area standards.

The standards are broken into three major sections: a foundations section of basic educational technology competencies for all teachers, a computer science content component, and a teaching methodology component. The computer science content

component contains performance-based competencies that reflect mastery of college-level computer science. The educational methodology section describes competencies specific to computer science teaching. These are in addition to the basic teaching methodology competencies expected of all teachers.

A similar effort devoted to secondary computer science curricula has been underway over the past decade. The chief leaders of this have been the Association for Computing Machinery (ACM) with its extensive secondary computer science curriculum and the College Board with its constantly changing Advanced Placement exam. An effort is now underway to produce a new secondary curriculum by late 2003. The structure of the proposed new curriculum will be presented with an opportunity for feedback during this formative time in the development process.

This presentation will focus on the NCATE teacher standards and the secondary computer science curriculum that is under development. The groups developing both guidelines need informed, responsible feedback and review. This presentation will lay the foundation for involving the international community in the development, feedback, and review process. It is important that we become aware of similar activities in other countries and attempt to unify and coordinate the efforts and the computer science education discipline. Active participation at this meeting or feedback through the online sites mentioned in this abstract is welcomed.

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PAPER SESSION - OBJECT MODELS

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Thursday, 25th July 2002
3.00 - 5.00 pm
Chair: Andreas Schwill

Exploration of object-oriented models in informatics education

Torsten Brinda, Sigrid Schubert

Abstract

The authors introduce the exploration of object-oriented basic concepts as a new approach to object-oriented modelling (OOM). While other subjects have a long tradition in learning by discovery with suitable learning aids (e.g. experimenting installations of the scientific subjects), Informatics at first has to define and to develop such learning aids. Therefore software development environments have been analysed and understanding promoting as well as understanding hindering functions have been identified. In detail the understanding promoting functions "support of the syntactic correctness of a model", "promotion of the logical correctness of a model" and "visualization of abstract concepts with change of the observation perspective" and the understanding hindering function "error avoidance by ban of action" as well as the fact, that the fundamental ideas of OOM are presupposed, were found. By these findings, design criteria of the Didactics of Informatics for so-called exploration modules, learning aids for the exploration of object-oriented basic concepts, are derived. These are the criteria "basic concepts on different abstraction levels" and "synchronization, transformation and evaluation of diagrams". Finally the role of exploration modules as a lesson medium is discussed and the application of the exploration by learners is worked out. Especially the change between different views of an object-oriented model to ensure completeness and consistency is stressed.

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Object models of IT-Systems supporting cognitive structures in novice courses of informatics

Peter Hubwieser

Abstract

Designing a new mandatory subject of informatics for the 6th grade of the Bavarian Gymnasiums we decided to use a certain type of object modeling to bridge the gap between two nearly opposite objectives: to enable the students to use IT-Systems in a competent and autonomous way as well as to teach durable and transferable basic concepts. Although there exist some arguments against the benefit of mental models, we rely on these in order to support our novice students in applying and mastering IT-Systems. This opinion is supported by some recent results of the pedagogical psychology. We present a suitable modeling technique that will be used in the novice course of the new subject and some results of the first evaluations of the testing courses.

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Design pattern: A topic of the new mandatory subject informatics?

Markus Schneider

Abstract
Design patterns are commonly used in object-oriented modeling for the solution of frequently appearing design problems. On the other hand object-oriented modeling is an important topic of the new mandatory subject informatics, which will be introduced in 2003 in all 400 Gymnasiums of Bavaria. In this paper we want to show, that design pattern might add a valuable contribution to such a mandatory subject, which has his main focus on teaching the substantial concepts of informatics and on stimulating mental models for real understanding of informatics.

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Development of mulitmedia animations - A contribution of informatics teaching to media studies

Michael Weigend

Abstract
The development of a multimedia visual model can be an informative process which requires and encourages a large number of abilities. This contribution focuses on three dimensions of the modelling process, all connected with certain abilities: Firstly an informative model is a simplified image of a real system. In this respect modellers are required to observe reality well, to recognise and describe structures. Secondly the model can be regarded as a medium through which certain mental contents can be imparted to recipients (communicative aspect). And lastly a multimedia model (especially if it is to be attractive) is a complex, technical product whose implementation demands the use of methods of information technology, e.g. object-oriented modelling.
Using the example of the object-oriented modelling of a waterworks with the help of Flash 5, we will discuss under what conditions the development of an animation in IT teaching can help modelling abilities.

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Theme: The Integration of Information Technology in the Course Curricula of the Faculty of Engineering at the University of Santo Tomas, Manila, Philippines

Re-inventing Engineering Education: Integrating Information Technology in the Mathematics Courses of the Faculty of Engineering, University of Santo Tomas

Cristino A. Carbonell

Engineering Sciences Department
Faculty of Engineering
University of Santo Tomas
Manila, Philippines
(632-731-4041)
cacarbonell@yahoo.com
criscarb@ustcc.ust.edu.ph

Keywords: Innovation, Learner-Centered-Learning, Learning Materials

Abstract: Learning has dramatically changed during the last decade. With the development experienced in information technology, the learning environment is now presented with several options on how easily and more excitingly knowledge can be acquired. Learning institutions have seen the tremendous influence the new technology has over its clients – the teachers and the students. It is for this reason that learning institutions unceasingly introduce changes in the course curricula. These can be manifested by the way computer technology is being integrated in the design of courses being offered. The Faculty of Engineering of the University of Santo Tomas is no exception. During the last five years, it has undertaken great changes in the instructional media and the course design of selected Mathematics courses. The paper seeks to describe the learning modules introduced by the Engineering Sciences Department of UST Faculty of Engineering which will serve as the framework in the production of learning materials in digital form.

1. Introduction

Information Technology has largely changed the learning environment in today's world. With this technology, learning becomes accessible anytime and anywhere. Thus, its relevance and overwhelming contribution to the enhancement and acquisition of learning cannot be overlooked. Educators of today are faced with a greater challenge with the onset of this technology. Gone are the days when the role of the teacher is to lecture and deliver his piece in a classroom. He has shifted his role from being just a mere supplier of information into being a course guide, an adviser and a genuine motivator. The use of multi-media has provided him with options to consider in better motivating and enhancing the learning acquisition of his students. The creation of a web-based course has made him more accessible to students. Communication with students has been feasible on a 24-hour basis due to the e-mail system.

It is expected that in advanced countries like the United States the integration of information technology in the design of the school curricula becomes a source of inspiration to improve on the quality of teaching and learning. In the IBM Series on Living in the Information Society, one of the papers presented discussed on some programs adopted by different colleges and faculties of universities across the country[Ve00a]. The Studio Courses at Rensselaer Polytechnic Institute in Troy, New York combines lecture, recitation and laboratory activities in a workshop setting that de-emphasizes lecture and intertwines laboratory and problem-solving activities in the Physics and Calculus courses into one team-based activity. The ECE270 course at the University of Illinois at Urbana-Champaign allows students to attend lectures but carry out homework drills through a software package called CircuitTutor. Project Vision of the Pennsylvania State University makes students work in local and multi-campus teams to complete courses based on a combination of guided worldwide web research, personalized mentoring via e-mail and group conferencing software and team projects.

2. The Coming of Age of Information Technology at the University of Santo Tomas (UST)

The University of Santo Tomas (UST) is the oldest catholic university in the Philippines. Founded in 1611, it has continuously provided the world with men and women who prove to be at par with the brightest men in the world. It is a dynamic institution which boasts of several of its colleges and faculties the status of being Centers of Excellence and Development as awarded by the Commission on Higher Education of the Department of Education, Culture and Sports. It continues to grow and keeps itself synchronized with the changing time.

2.1 The UST Educational Technology Center

The Educational Technology Center of the University of Santo Tomas is the media production and information technology center of UST[Es01]. The Ed Tech Center initially dealt with the audio-video production of documentaries of university-wide events. In 1996, the director of the center had a vision of

incorporating computer technology into the school curricula recognizing that this would be the trend in years to come. The following year, the center began training administrators and faculty members on the many uses of the technology in the academe. This would go on until there exists a culture of computer technology in UST, especially now that the university is nearing its 400th anniversary in 2011. As of today, there are at least 10 multi-media classrooms complete with an LCD projector set, computers, air-conditioning units, and other facilities. By 2011, chalks and blackboards will be a thing of the past.

2.2 The Faculty of Engineering

The Faculty of Engineering of the University of Santo Tomas (UST) in the Philippines boasts of being the oldest engineering institution at 95 years. For almost a century now, it has provided the country and the world with not only highly-competent engineering professionals but highly ethical and moral as well. This time, it sees itself as providing the world with professionals who are adaptable to the demands of a very dynamic profession and can readily cope with the rapid growth that technology is experiencing right now. It is deemed necessary that courses offered to its students should employ the use of information technology not only to make them knowledgeable on the area of study defined by a course but also to create awareness of the power that information technology can be provide any learner[Ve00b]. The most effective and powerful sources of learning are provided by this new technology. Knowledge is just a mouse click away. The days of being physically present in the learning environment just to gain new knowledge will be of the past. Ideas, comments, discussions, critiques and answers to questions are readily available through the Internet and these are not limited to those provided by the teacher. They are information gathered from a variety of sources – peers, the teacher, other members of the teaching staff, textbook authors, and authoritative people outside the perimeters of the learning institution.

Five multi-media rooms have been constructed at the Roque Ruano Building which houses the Faculty of Engineering. The Chemical Engineering Department has been the custodian of one of these rooms. It is not surprising that the department is the first to integrate the use of the PowerPoint Software in some of the courses offered by the department[LL01]. PowerPoint Aided Lectures (PAL) were utilized in the following subjects: Waste Management, Unit Operations 3, Thermodynamics and Reaction Kinetics. The teaching staff who prepared the presentation was very meticulous in the choice of graphics, animation, supporting video and sound. Generally, the students preferred PAL to overhead projector lectures especially when the subject matter is descriptive. For complicated mathematical derivations, the students preferred the traditional chalkboard lectures.

2.2.1 Independent Learning

Recently, the Engineering Sciences (ES) Department has been tasked to take care of three multi-media room. The department handles the Mathematics courses of the Freshmen and the Sophomores. In 1997, the department was commissioned to prepare learning modules in Plane Trigonometry and Solid Geometry. This was the first step taken to introduce into the University the concept of independent learning. No oral lectures are to be delivered in the classroom. The student takes the responsibility of learning the concepts of the course primarily by himself. He may work with his classmates or may seek the help of other faculty members not handling the modular instruction. Consultation with the assigned teaching staff is made at a specified time.

The course in Plane Trigonometry was divided into eight (8) learning modules while Solid Geometry was divided into seven (7) learning modules. Practice exercises are assigned every learning unit and are evaluated. The number of examinations administered to the students equal the number of modules.

The learning modules were designed in such a manner that a student is guided carefully as to how to go through the material and learn the subject matter.

The first part of the module is subdivided into:

1. The General Overview – provides the learner with the concepts presented in the unit.

2. The General Objectives – enumerates what are expected of the learner at the end of the unit.

3. The Pre-requisites – identifies the required knowledge to successfully go through the unit.

4. How to Use the Module – discusses how the student handles the material.

5. The Pre-Test – evaluates the learner of his knowledge about the unit and the result may allow him to proceed to the next unit or go through the present unit.

The second part deals with the specific lessons of the unit. The learning units have an average of four (4) lessons. Every lesson is divided primarily into five (5) parts.

1. The Specific Objectives – defines the specific behavior expected of the learner at the end of the lesson.

2. Discussion – presents the concept of the lesson to the learner in a very personal style. While reading through the text, the learner feels the instructor is in front of him addressing him the way a lecturer does it in the classroom.

3. Illustrative Examples – provides the students with sample problems and solutions to selected exercises.

4. Practice Tasks – exercises given the learner to work by himself.

5. Key to Practice Tasks – provides the answers, not the solutions, to the Practice Tasks. Consultation with the assigned teaching staff will aid the student in finally arriving at the correct answer.

The last part of the module is the Post-Test. The learner makes a self-evaluation by going through exercises which cover all the lessons learned in the module. A key to the Post-Test is provided. A one-hour examination is finally taken by the learner.

Feedback from the students who undertook the mo dular classes prove very positive. Self-confidence was highly developed. Independence from the teaching staff has made them realize that the power to learn absolutely resides in them. The value of team-building has been emphasized.

A comparative study was made between students who enrolled in the modular classes against those who are enrolled in the traditional chalkboard classes[Gu01]. Both classes took the same examinations designed by the department. The study shows that there a higher percentage of students passing in the modular classes of Trigonometry and almost the same percentage for those who took the Geometry classes. It is noted, however, that the modular class in Geometry, handled by a non-author of the learning modules, registered the highest number of failures. This is attributed to the perception of most of the teaching staff that the learning module replaces the instructor. Thus, strict compliance with the administration of the modular class was not observed.

A follow-up of the Freshmen who passed the modular classes was investigated. How did they fare in the next Mathematics subject which is Differential Calculus with Plane Analytic Geometry? A good 93% of them passed Calculus!

Initially, the learning modules are provided in print form. But with the acquisition of the department of the multi-media rooms, the idea of bringing the modules in diskette or disc form is brought out.

2.2.2 The Near Future: On-line Learning

The technology of instruction at the ES Department is looking toward the maximum use of multi-media in the design of the course curricula in College Algebra, Plane Trigonometry, Solid Geometry, Plane Analytic Geometry, Differential and Integral Calculus, and College Physics.

The learning modules designed for the Freshmen students will serve as the foundation for the integration of computer technology in the other courses. The ES Department is considering a tie-up with the UST Ed-Tech Center for the transformation of the printed learning modules into diskette or disc form. The end product must be highly-motivational because it will integrate graphics, sound and video in the presentation of the concepts and solutions to mathematical problems. It is envisioned that the material may be utilized in hybrid classes where the traditional lecturer may sparingly use the technology or fully utilized in on-line learning which the University wishes to attain by 2011.

3. Conclusion

The Faculty of Engineering of UST has been spearheading the instructional innovations at the University of Santo Tomas. The first training seminar sponsored by the UST ED-Tech Center was exclusively attended by the Engineering teaching staff. The first two multi-media rooms were constructed at the Engineering building. Learning modules for independent learning were first designed and introduced at the Faculty of Engineering. It is, therefore, logical that the first on-line learning programs will be initiated, designed and implemented by the Faculty of Engineering.

In contemplating the future of instructional technology at the University, certain questions must be considered.

- How much will it cost the learner to avail of this new technology?
- May the learners opt not to avail of this new technology?
- Will the new technology guarantee the learner of his competitiveness in the global market?
- Is the new technology a threat to the continued existence of the teaching staff?
- Does the new technology displace some of the teaching staff?

Information Technology has only reaffirmed that learning is a never-ending process. Learning is forever. The engineering profession is a very dynamic one. It is incumbent upon the engineering student, graduate, and practitioner to keep a strong hold of the fundamental principles and continue the search for new knowledge. Update with the present trend and developments. Be always imaginative and creative to improve what there is in the world. These are all for society's benefit, safety, and progress.

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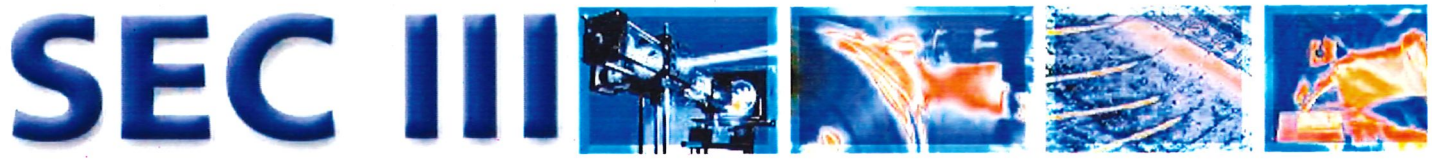

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CREATIVE EXCHANGE II

Thursday, 25th July 2002
1.00 - 1.30 am
Chair: Ulrik Schröder

The European information society: Social Dimension

Panagiotes S. Anastasiades

Abstract

Indisputably, nowadays we live in the information revolution age, as a result of the rapid development of the new applications of technologies and communications, which pervade almost all parts not only of our professional but also our everyday life. The global explosion of the Internet, the massive use of powerful and very fast personal computers and the considerable upgrade of the telecommunication services and networks created the circumstances for the appointment of a digital platform of communication on a planetary level.

A new digital continent is born in which concepts like borders, geographical distances, movements, means of transportation, do not have anymore any importance. The communication between people is not dependent from the geographical distance that exists between them, but from their capability to access the network. The concept of time and distance gains a different importance and is realized today in a different way.

Concerning the citizens of a new global world, the concept of communication gains an entirely different content; it creates though a paradox. Despite the fact that the communication of modern man through the networks is unlimited, the feeling of loneliness is expanding and especially in a dangerous manner. So, the electronic connection cannot replace the human contact, neither it can blunt the warmth of interpersonal communication. The technological involvement differentiates two concepts, which until today were identical: the concepts of isolation and loneliness. In our days in the electronic side streets of the global village we meet more and more lonely but not isolated people. Is there a chance that this prototype tends to become dominant? If yes how can we face it?

The methodological analysis that will be followed as part of this paper will diverge from the context of technological determinism, coming more close to the consideration of the social formation of the technology.

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CREATIVE EXCHANGE II

Thursday, 25th July 2002
1.00 - 2.30 am
Chair: Ulrik Schröder

The European information society: Social Dimension
Panagiotes S. Anastasiades

Re-inventing engineering education: Integrating information technology in the mathematics courses of the faculty of engineering, University of Santo Tomas
Cristino A. Carbonell

Animated pedagogical agent in a learning environment
Maria Augusta S. N. Nunes, Luciane Fraga, Leandro L. Dihl, Lisiane Oliveira, Cristiane R. Woszezenki, Deise J. Francisco, Glaucio J. C. Machado, Carmen R. D. Nogueira, Maria da Glória Notargiacomo

Science communication & the web
Ben Kokkeler

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PAPER SESSION - PEDAGOGICAL CONCEPTS

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Thursday, 25th July 2002
10.30 - 12.00 am
Chair: Johannes Magenheim

Taking the best from real teaching environment
Iolanda Cortelazzo

Abstract
This paper is a description of scenarios and approaches I have been facing and using in my experience as a teacher. I have been using ICTs to mediate knowledge construction and critical thinking skills development with under-graduated students in different technological environments in private Higher Education institutions. This work emphasizes the use of ICTs as collaborative learning and teaching tools.

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Innovative pedagogical practices using ICT - Results of the German SITES-M2
Rebekka Dalmer, Thomas Petzel, Renate Schulz-Zander

Abstract
The international SITES-Module 2 (Second Information Technology in Education Study) of the IEA is a qualitative study of innovative pedagogical practices that use Technology in schools in 28 countries. Twelve case studies have been conducted in primary, lower and secondary schools in Germany. Results of the German SITES-M2 concerning the outcome of teacher and student practices are presented and discussed in the paper.

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Net-based distance education in the traditional university
Paul-Thomas Kandzia

Abstract
E-learning will not inevitably cause a revolution of the traditional university. On the contrary, it is not clear whether multimedia and network technology will find its place in the university to the profit of the students. We discuss various methods and techniques and propose best practices, which can succeed under the specific conditions of a traditional university.

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CREATIVE EXCHANGE I

Thursday, 25th July 2002
1.00 - 2.30 pm
Chair: Jane Andersen

Facilitating critical evaluation of information on the world wide web
Marie Iding, ThanhTruc T. Nguyen, Ariana Eichelberger, E. Barbara Klemm

Self-guided learning in teaching mathematics at senior high school level (SelMa) - Experiences from practice
Kristine Fankhänel, Wolfgang Weber

Registry on public school - Using technology to serve people
Joaquim Celestino Júnior, Marcos Clayton Pessoa

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CREATIVE EXCHANGE I

Thursday, 25th July 2002
1.00 - 2.30 am
Chair: Jane Andersen

Facilitating Critical Evaluation of Information on the World Wide Web

Marie Iding, ThanhTruc T. Nguyen, Ariana Eichelberger, E. Barbara Klemm

This research is sponsored in part by DARPA grant, Award Number NBCH1020004 awarded to the first author. The contents of this report do not necessarily reflect the position or the policy of the U.S. government, and no official endorsement should be inferred.

Abstract
One of the recent foci of our research at the University of Hawaii has been on the development of critical Website evaluation skills, primarily in the area of science. For example, in one study we compared preservice teachers' and scientists' judgments of the credibility of various scientific information sources. Preservice teachers and scientists differed on the kinds of information sources they selected as credible (Klemm, Iding, & Speitel, 2001). This finding was indicative of a need for critical evaluation skills, especially with the proliferation of nonrefereed material on the World Wide Web. In subsequent research (Iding, Landsman, & Nguyen, in press), we noted that although there are a number of resources that provide guidelines for evaluating Web-based material, there is a dearth of research in this area. Also, many teachers report that they believe it is the responsibility of other teachers (especially English teachers) to carry out this kind of instruction (Nguyen, 2000). In response to these needs, we carried out a study in which we facilitated high school students' developing their own criteria for evaluating scientific websites (Iding, Landsman, & Nguyen, in press). We have continued this research by working with preservice teachers in this area and have been enriched by our discussions with other researchers and educators regarding the cognitive and ethical dimensions of working toward the development of critical Website evaluation skills.
In this session, we plan to address the following questions:

1. What critical evaluation skills are needed for K-12 students and preservice and practicing teachers as they evaluate Web-based information in the content areas?
2. How has the need for students' critical evaluation skills affected participants' teaching practices in different content areas?
3. As researchers and educators, can we develop research-based guidelines for instruction and directions for further research in this area?

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Self-guided Learning in Teaching Mathematics at Senior High School Level (SelMa) - Experiences from Practice

Kristine Fankhänel, Wolfgang Weber

Abstract
In five authoring schools teachers have developed units and materials which can be used to support self-guided learning in different learning scenarios. These teachers also suggest to use mindmaps for orientation in the work, to write learning diaries to reflect the learning process and further ideas. The suggestions and materials have been assessed in ten trial schools with regard to their feasibility in everyday teaching situations in several courses. The contribution presents details of the SelMa-project, reflects the experiences and focusses on the latest findings of the evaluation.

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Registry on public school - Using technology to serve people

Joaquim Celestino Júnior, Marcos Clayton Pessoa

Abstract
TECHNOLOGY FOR HUMANIZATION was planned and accomplished during 6 months by the Institute of Software of Ceará – INSOFT – for the Secretary of Basic Education of Ceará – SEDUC – in 2000 and 2001. Its objective is to enhance the attendance to the citizen, in

other words, to the parents willing to enroll their children in any school of the State Net in the capital of Ceará.

The challenge of serving a public that had been facing very long lines for 10 years searching a vacancy for their children, made us believe that the technology was connected to a wish: offering a humanized attendance.

This is not only a project, it is a tool that put technologies altogether to give back to the citizen time and respect.

The innovative aspect of the whole project is made of the integration of technologies and human actions that benefit the citizen.

We describe in this paper the methodology and all the steps to do this project.

The TECHNOLOGY FOR HUMANIZATION project benefited the whole community and 45 581 parents that were promptly attended and 620 students who worked as operators, receiving assistance and a scholar. In an indirect way, the directors, secretaries, supporters and members of the staff were also benefited.

The success that was reached is a sign of encounter, respect and intellectual ability which was amplified in the next motivated by the same objective: HUMANIZATION.

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PAPER SESSION - SOCIAL ASPECTS

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Thursday, 25th July 2002
10.30 - 12.00 am
Chair: Yvonne Büttner

Teaching social informatics as a knowledge project

Iver Jackewitz, Michael Janneck, Detlev Krause, Bernd Pape, Monique Strauss

Abstract
Teaching Social Informatics has to deal with the ambiguity of portraying future scenarios of technology development and use on the one hand and with harsh critics of these scenarios on the other hand. In order to deal with this ambiguity, we consider it not sufficient to merely present it. But, in our opinion, students should have the opportunity to gain experience in technology use, new forms of work organization, and related ways of organizing their lives during their studies. In order to offer our students authentic educational settings, we regard studies in Social Informatics as a "knowledge project". In this paper, we will first describe what we mean with studying Social Informatics as a knowledge project. Then we will especially focus on our efforts to develop to software systems, namely *CommSy* and <mind>, designed to support knowledge projects.

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Using a lecturer's personal web site to enhance the social interchange among students in a academic course

David Passig

Abstract
Developments in web-based communication technology have opened up new ways for students at a distance to communicate with their teachers and with each other. The literature covers three types of web-based interactions: *learner-content interaction, learner-instructor interaction, and learner-learner interaction* (Moore 1989, Tribe 1994). However, the purpose of this study was to examine a newer aspect in these relationships. The aim was to investigate the social impact of a lecturer's personal web site (www.passig.com) on the personal interchange with his students.
The participants were 63 students taking the author's one graduate course at the University. The students were given learning assignments, which required social interaction to complete, using a variety of Peer-to-Peer technologies.
The results show that most of the students found the lecturer personal web site as an efficient P2P (Peer-To-Peer) tool that enhances social interchange outside the walls of the class, and 85.7% of the students recommended that it is important to add personal aspects as being delivered only on a personal web site into academic courses.

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Potential problems of computer-mediated school education

Glenn Russell

Abstract
The growth of on-line capabilities in school education has reflected the overall growth in

society. However, there are both advantages and disadvantages. In the twenty-first century, the availability of on-line education increases the possibility that virtual experience will be substituted for reality. There are also concerns that there will be a blurring of appearance and reality, and that cultural imperialism will continue to spread by use of the Web. These factors are considered in terms of the need to establish future guidelines to reduce the adverse impact of the Web on school education.

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FRIDAY, 26th July 2002

9.00 - 10.30 am	**Paper session - Virtual communities** Chair: Pieter Hogenbirk • Regional learning networks - Building bridges between schools, university and community Andreas Breiter • Online knowledge communities: Meeting places for continuing professional development Sjoerd de Vries • Distribution of internet community knowledge based on traditional communication media J.F. Hampe, Silke Schönert
9.00 - 10.30 am	**Paper session - Methods of informatics** Chair: Valentina Dagienë • Learning software engineering with EASE Dirk Draheim • Key decisions in adopting algorithm animation for teaching Guido Rößling • Learning to solve ICT / Informatics-based problems Mary Webb
10.30 - 11.00 am	**Break**
11.00 - 12.00 am	**Keynote** Chair: Raymond Morel Key issues in IFIP-SIG9.2.2 Approaches to Ethics of Computing Jacques Berleur, University of Namur
12.00 - 12.30 pm	**Presentation of results**
12.30 - 1.00 pm	**Closing session** Chair: Sigrid Schubert
1.30 - 4.30 pm	Guided tour "Dortmund - yesterday and today" Come with us on a tour of Dortmund as it was in the past and as it is today. You will see many sights, old and new, of Dortmund and its suburbs, you will hear many facts, figures and stories from Dortmund's history. Discover not only the Port of Dortmund and the Borsigplatz but also idyllic miners' houses and medieval moated castles like "Schloss Bodelschwingh". The highlight at the end of the tour will be a visit to the former coal-mine "Zeche Zollern II/IV". A guided tour of this - for its time - exemplary coal-mine with original Art Noveau architecture will leave a lasting impression.

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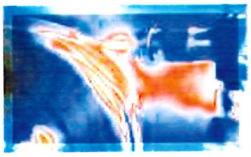
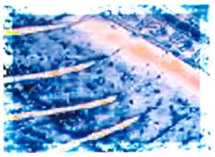
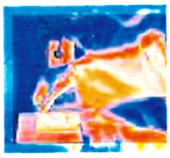

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KEYNOTE

Friday, 26th July 2002
11.00 - 12.00 am
Chair: Raymond Morel

Key issues in IFIP-SIG9.2.2 Approaches to Ethics of Computing

Jacques Berleur, University of Namur

Abstract

Ethics has been, within IFIP, a preoccupation for a long time. But the debates started formally in 1988 about a suggested international 'Code of Ethics'. The 1992 General Assembly concluded that the time was not ripe to adopt such an international Code and asked a Task Force within TC9 to provide it with some recommendations. During this first phase, a full analysis of the current codes of the IFIP member societies was undertaken which enlighten the major deontological professional issues, such as respectful general attitude, conscientiousness, competence, promotion of privacy and confidentiality, transparency of information to parties, etc. The 1994 IFIP General Assembly adopted recommendations. A Special Interest Group SIG9.2.2 was also established for favouring the creation of 'spaces for discussion' where the ethical debate should be permanently promoted and supported in the different national societies of IFIP and in other constituencies. In a second phase, SIG9.2.2 confronted ethics and the governance of the Internet, and published as material for discussion in the spaces for discussion a monograph, which develops the main issues as they appear in new charters, commandments, codes, guidelines,... for the Internet. The third phase has deepened the previous approach, focusing on the relationship between ethics and self-regulation. SIG9.2.2 has made recommendations on the minimum requirements for establishing self-regulating instruments, which could be considered as ethical. Those three phases may clarify the debate on what are, or should be, the issues at stake to be considered in "Ethics of computing" education. At least it supplements what already appears in handbooks and books on the subject.

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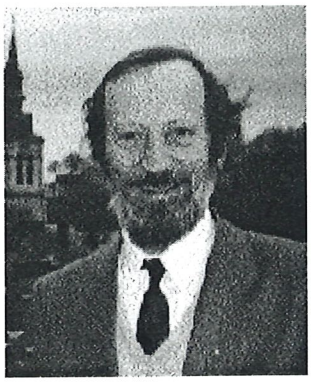
Computer Science Faculty



Jacques Berleur

Institut d'Informatique
Facultés Universitaires Notre-Dame de la Paix
Rue Grandgagnage, 21
B - 5000 - Namur (Belgium)
Voice: +32 81 72 49 76
Fax: +32 81 72 49 67
Email: jberleur@info.fundp.ac.be
Born: July 22 1938

Jacques Berleur is professor at the Computer Science Faculty of the University of Namur (Belgium) since 1972, where he specializes in "Computers and Rationality" as well as in "Computers and Society" and in "Ethics of Computing".

His research interests include epistemology of computing, technology assessment in the field of development and use of information and communication technology, social informatics, as well as ethics of computing. He is co-director of CITA (*Cellule Interfacultaire de Technology Assessment*), an interdisciplinary research team specialized in the assessment of information and communication technology.

He has been President of his University, a Jesuit University, for 9 years (1984-1993) and European advisor near the Jesuit Advisory Committee for Higher and University Education of the Society of Jesus in Rome (1994-1997).

He is also active in the International Federation of Information Processing (IFIP), namely in its Technical Committee 9, "Relationships between Computers and Society", since its creation (1976), where he is the Belgian representative, and has chaired one of its Working Group, WG9.2., on "Social

Accountability" (1990-96). He has also been called to chair its Ethics Task Group, set up by the IFIP General Assembly (1992-94), now become a special interest group, IFIP-SIG9.2.2 "IFIP Framework on Ethics" He got the IFIP Outstanding Service Award (1988) and the IFIP Silver Core (1992).

He has been involved as Belgian expert in several projects at the Commission of the European Communities including the FAST Programme (Forecasting and Assessment for Science and Technology) and the MONITOR Programme (1989-93) and co-authored the first "Science and Technology Assessment Report" to the European Parliament. He is co-founder of the European Association for Society, Science and Technology (ESST), a consortium of fifteen European Universities which has created common Master curricula in "Society, science and technology".

He is corresponding member of "Académie Européenne des Sciences, des Arts et des Lettres", Paris, since 1993.

He is author of approx. 200 papers and has authored and edited several books including:

- *The Information Society: Evolving Landscapes* [Springer-Verlag, 1990]
- *Information Technology Assessment* [North-Holland, 1991]
- *Risk and Vulnerability in an Information Society* [North-Holland, 1993]
- *Rôles et Missions de l'Université* [Namur University Press, 1994]
- *Ethics of Computing: Codes, Spaces for Discussion and Law* [Chapman and Hall, 1996]
- *An ethical global information society: Culture and democracy revisited*, [Chapman & Hall, 1997]

 Computer Science Institute

 The University of Namur

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PAPER SESSION - VIRTUAL COMMUNITIES

back

Friday, 26th July 2002
9.00 - 10.30 am
Chair: Pieter Hogenbirk

Regional learning networks - Building bridges between schools, university and community

Andreas Breiter

Abstract
The so-called "digital divide" seems to be a major social obstacle for the Information Society. Most experts agree that citizens will need competencies that go beyond the basic cultural skills. But where to get them? The idea of life-long-learning illustrates a major problem of our educational institutions: they work separately, they only process the results of the preceding phase and there is a lack of interconnection. This paper tries to develop a concept of a regional education network that includes pre-school, K-12 and further education, public libraries and community centers as well as other educational institutions. Following the path of the digital divide as a social and educational divide and focusing on the school as one major player in the regional network, the innovation process and the actors will be highlighted. Using action research in a project between schools, local community, private partners and the university, the idea of the regional network is illustrated, the encountered problems are described in order to give an impression of the realistic view of an integrated education policy.

back

Online knowledge communities: Meeting places for continuing professional development

Sjoerd de Vries

Abstract
We describe the concept of Online Knowledge Communities (okc) as meeting places for continuing professional development (cpd). We see an okc as a social network of members, who are online organized by making use of an online knowledge center, having an adequate group culture and are involved in appropriate information processes to develop and exploit a certain knowledge domain. We expect that the application of okc for cpd will have positive effects on the professionalism of the professionals and the development of knowledge assets in knowledge intensive organizations.

back

Distribution of internet community knowledge based on traditional communication media

J.F. Hampe, Silke Schönert

Abstract
In recent years the creation of internet based knowledge have become increasingly significant. However, with regard to the influence and control of knowledge management processes, knowledge communities indicates specific problems for creating and distributing knowledge. People without internet access are left out from this knowledge dissemination. The project CCIRP takes problems of this kind into account and shows concepts how knowledge generation in knowledge communities (e.g. cc-expert) can be realized and how this knowledge can be distributed based on traditional media.

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PAPER SESSION - METHODS OF INFORMATICS

back

Friday, 26th July 2002
9.00 - 10.30 am
Chair: Valentina Dagienė

Learning software engineering with EASE
Dirk Draheim

Abstract
We present an ultra-lightweight software engineering process model that specifically targets student projects in higher education. The model has been obtained by analyzing the requirements of student projects and then carefully combining relevant concepts from state-of-the-art software management strategies. Recommendations are given for structuring the course as a whole, as well as managing the work. The latter is oriented towards mature andragogical methodologies.

back

Key decisions in adopting algorithm animation for teaching
Guido Rößling

Abstract
Algorithm Animation is becoming increasingly popular with several educators. However, certain key questions have to be addressed before an informed decision on a given system can be made. This paper tries to identify several such questions and provide a brief overview of some algorithm animation systems. The key decisions are grouped in four entries: system type and animation generation approach, display properties, import and export facilities, and didactical requirements. After considering these requirements, deciding on a given system should be easier for educators.

back

Learning to solve ICT / Informatics-based problems
Mary Webb

Abstract
The need for developing a pedagogy for ICT/informatics has been identified. While a great deal of research and thinking has focused on theories of learning in relation to ICT this has concentrated on *using* ICT rather than *learning* ICT or Informatics itself so the links between theories of learning and practice of teaching are much less clear for ICT. The nature of the ICT curriculum is examined in order to identify how particular theories of learning may inform the development of pedagogy for ICT. The components of a model of problem solving that fits in with the primary emphasis of ICT/informatics courses are explored in relation to key learning theories and some pedagogical implications are identified.

back

This page was last updated 02-06-17

SEC III, Dortmund, July 21-26, 2002

Report for the Working Group on **COLLABORATIVE LEARNING**

Members of the working group:

Jane *Andersen* (Denmark), Bernard *Cornu* (Chair, France), Yolanda *Cortelazzo* (Brasil), Dirk *Draheim* (Germany), Andrea *Karpati* (Rapporteur, Hungary), Ruth *Messner* (Germany), Guido *Rosling* (Germany), Anna *Strehler* (Rapporteur, Australia), Tjerd *de Vries* (The Netherlands)

Observation of current practice

Collaboration intensifies the human aspect of learning. It increases our learning potential and empowers us with the knowledge of others. It is an ancient educational model (e.g. knowledge building in pairs by Plato and Socrates, study groups at medieval noble courts, constructive learning of the Reform Pedagogy movement etc.).

Collaborative activities are democratic by nature but require careful planning, monitoring and scaffolding by the teacher. Collaboration makes group members more flexible and eventually replaceable as knowledge and experiences are shared by the group as a *learning community.*

Concepts of collaboration vary from country to country – some projects are more mentoring-intensive, others aim at substituting teacher work through student engagement. In order to develop successful strategies and teaching aids, mental models and learning theories have to be used. (Some important contributions: Collaborative Learning Theory by Kenneth Brophy, Action Learning Theory by Ray Revans, Entrainement Mental by Jean Francois Chosson.)

Organisation of knowledge in collaborative learning projects in crucial: currently observable rigidly controlled input and output methods, linear curriculum structures do not generally support collaboration of learners. In a collaborative learning environment, students should acquire *co-operative behaviour and learning content* at the same time.

ICT may support but also hinder collaboration. All ICT-based collaborative projects should include face-to-face components to motivate learners and increase their social as well as learning skills. Important bodies of research support the use of collaborative learning through ICT at all levels of education. Some examples:

- CSCL environments and cognitive tools, e.g.Knowledge Forum by M. Scardamalia and K. Bereiter, University of Toronto
- International digital projects of the European Schoolnet (EUN)
- SEMIK Project – collaborative learning experiments, H. Mandl, Univ. of Munich,
- KOLUMBUS Learning Space, Univ. of Dortmund
- Collaborative mentoring at La Villa Media, Grenoble
- Jigsaw Classroom Method by Aronson

Collaborative learning methods are generally *taught but not experienced* directly as part of Theory and Practice of Learning studies in teacher training. Theoretical knowledge is not applicable in classroom practice unless teaching methods are associated with them.

Assessment Issues

Collaborative learning requires *suitable assessment methods* that value team work. If individual achievement is the only valuable outcome, group members will compete instead of support each other. Traditional examination and grading systems discourage team work.

Personality of the learner and teacher contribute hugely to the success or failure of participation in a collaborative learning experience. (Research at Budapest University on personality traits and work in a CSLE.) Some characteristics are modifiable through successful mentoring but certain learning and teaching styles are not. (The "Electronic Peer Review" method under development at the University of Adelaide, Australia, and the computer-based essay evaluation software of the University of Melbourne offer promising assessment alternatives.)

School disciplines or learning areas allow for different collaborative methods – also, some knowledge items, skills and abilities can be fostered through collaboration while others require frontal or individualised approaches.

ICT supports accurate and detailed assessment of the collaborative process, but privacy needs to be protected and too much control avoided. Some educators believe that the collaborative process should not be monitored, only the outcome assessed – others find ICT-based evaluation of collaborative learning important for developing successful teaching strategies.

Ideas for Action

- *Collaboration as a learning activity* should be encouraged at all levels of education and professional life. Present assessment practices – both at school and in professional life - do not support co-operation.
- *Mental models* of learners and *learning models* should be conceptualised before planning a collaborative learning project.
- *Human aspects* of collaboration in an ICT- supported environment should be carefully studied and results used in CSLE design.
- Broadly used *ICT-based learning tools and environments* should be assessed to find out if and how they support collaborative learning and other contemporary educational paradigms.
- Collaboration needs a supportive institutional environment. *ICT acts as a catalyst, evaluator and moderator* for collaborative learning and makes desirable communication, mentoring and co-operation practices easier to realise with large groups of learners. Face to face teaching and tutoring is and will always be, however, at the core of education.

Dortmund, 24 July 2002-07-24

Rapporteurs: Andrea Karpati (karpatian@axelero.hu) and Anna Strehler

SECIII, Dortmund, July 21-26, 2002
Report of the Working Group on

COLLABORATIVE LEARNING

Members : J. **Andersen** (Denmark), B. **Cornu** (Chair, France), Y. **Cortelazzo** (Brasil), D. **Draheim** (Germany), A. **Karpati** (Rapporteur, Hungary), R. **Messner** (Germany), G. **Rosling** (Germany), A. **Strehler** (Rapporteur, Australia), T. **de Vries** (The Netherlands)

Observation of Current Practice

Collaboration intensifies the human aspect of learning. It increases our learning potential and empowers us with the knowledge of others.

It is an ancient educational model much studied today (e.g. constructionism, cognitive apprenticeship, CSLE)

Collaboration is democratic by nature but require careful organisation of knowledge, monitoring and scaffolding.

ICT may support but also hinder collaboration. Face-to-face encounters are crucial to motivate learners and increase their social as well as learning skills. (Good examples e.g. Knowledge Forum, SEMIK, KOLUMBUS, La Villa Media)

Assessment Issues

Collaborative learning requires suitable assessment methods that value team work. If individual achievement is valued, group members will compete.

Personality of the learner and teacher contribute hugely to the success of collaborative learning.

Learning areas allow for different collaborative methods some knowledge items, skills and abilities require frontal or individualised approaches.

ICT supports accurate and detailed assessment of the collaborative process, but privacy needs to be protected and too much control avoided.

Suggestions for Action

Collaboration as a learning activity should be encouraged at all levels of education and professional life. Present educational environment is not supportive.

Mental models of learners and learning models should be conceptualised before instruction design.

ICT acts as a catalyst, evaluator and moderator for collaborative learning Face to face teaching and tutoring should still remain at the core of collaboration.

Human aspects of collaboration in an ICT- supported environment should be carefully studied.

Broadly used ICT-based learning tools and environments should be assessed to find out if and how they support contemporary educational paradigms.

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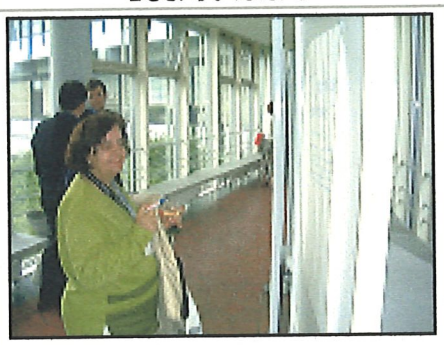

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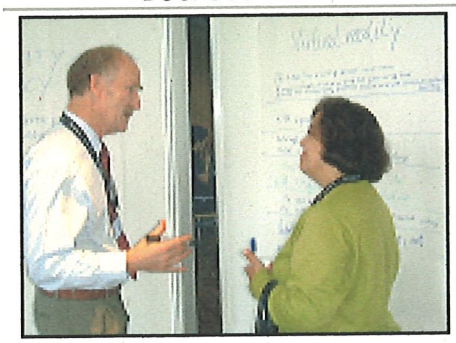

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SEC III, Dortmund, July 21-26, 2002

Report for the Working Group on **COLLABORATIVE LEARNING**

Members of the working group:

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Dortmund, 24 July 2002-07-24

Rapporteurs: Andrea Karpati (karpatian@axelero.hu) and Anna Strehler

Working Group on Social Issues and Powershifts at SECIII

Raymond Morel

Dirk Draheim

Marc Pilloud

Muddassar Farooq

FACTS

- Business culture is increasingly competitive
- Digitalization is the "most extreme" form of abstraction
- It's difficult to cohabit Tree structure and Network structure
- Internet is transforming the social interaction among different age groups in society in all countries
- Many university students in Europe are dissatisfied with their curricula
- ICT is a major component in merging personal, private, leisure and work time

FACTS (2)

- In contradiction to claims made in the ninties, ICT has not decreased the gap between North and South - it is worsening the situation
- The frontier between fact and fiction is fuzzy
- Important areas of ICT "knowhow" still lack understanding on a conceptual level
- Today we have more and more information but less and less critical understanding
- ...

RECOMMENDATIONS

- Don‘t apply the rules of the production process to the learning process
- Be aware of different rules and regulations in different kinds of environments (school, job, game...)
- Foster interpersonal, social relationships among individuals and/or groups in a society/countries
- Change learning from a push to a pull model
- Emphasize critical analysis and become

RECOMMENDATIONS (2)

- Take into account and integrate many powershifts like: Teaching ⇔ learning; global ⇔ local; central ⇔ peripheral; traditional ⇔ new media; private ⇔ public; school ⇔ society; individual ⇔ groups... (Increase the multiplicity of partners)
- Try to integrate ICT into society and <u>not</u> vice versa

CONCRETE ACTIONS

- Don´t be afraid to tell students that you do not fully understand all of the leading edge concepts
- Provoke and facilitate frequent face to face exchanges and communications among top professionals in industry, top academic researchers and decision makers in education
- Stimulate young researchers to carry out research into social issues/ power shifts

CONCRETE ACTIONS (2)

- Establish links with the concrete actions of the other working groups (equity, imported culture, cyber crimes, e.t.c.)
- Include social aspects/powershift issues in teacher education in a comprehensive manner by including all partners.
- Help parents understand the importance of social aspects in child development.
- Take the opportunities offered by ICT to allow young people to teach adults (use of a mobile, send an email, program DVD

CONCRETE ACTIONS (3)

- Focus on learning by doing – become a coach for others.
- Explore and provide the possibility of "Time out" for personal development during the life long learning process.
- Encourage each school actor to be a producer by initially focusing on the process of learning and not on the end product. Increasingly refining the product comes later on.

Cyber Risk

Security, Privacy

?

Facts

Surveillance cameras everywhere, web cams
Private photos on the web

Government browsing E.mails

Encryption of E.mails is a solved problem since more than 15 years but not applied

Manipulating private data of stolen pieces of new technologies

Links between mobile industries and factories and network providers

Facts

Website and privacy? Updated and dynamic Information is difficult to control in real time

People who create system with risk never share with people who are aware of risk s (identity card, mobile, controlling moving through GPS...)

Everybody feels suspicious but a few does anything (copyright, giving their bank account number.....)

Human agents collapse with digital agents (for example Konstanz / Bodensee crash)

Questions

Use of Technology precedes the Conscience of this Using (for example E.voting...)

Evolution of Privacy during centuries (local life vs global life)

Even if a technology makes it possible, we are not allowed to escape the human rights (digital pictures without permission on the web)

Taking responsibility or taking risk ?

How to educate the users ?

Informational self determination as a part of human rights ?

Recommendations

We don t have to create a system we can t control
(the role of agents in information systems)

Open sources are the best guarantees to uncontrolled agents

Take care with cookies and customer profiles

No advertisement or no link to an internet service without an agreement guaranties protection of privacy

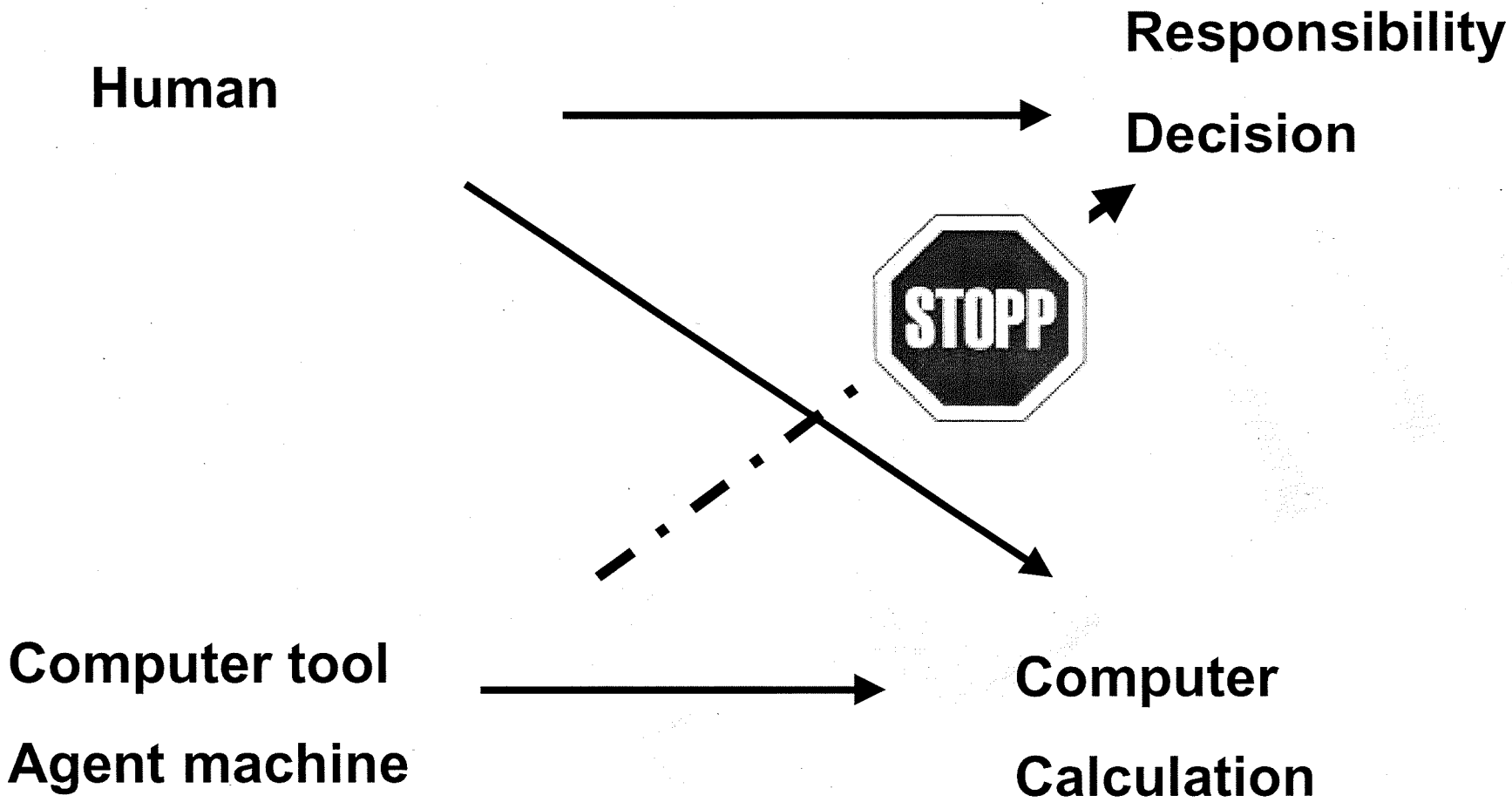
We have to protect minors in educational system (difference between children in school an employees)

We have to inform and to educate the user

Educate the user to understand the code of ethic

SEC III

working group discussion 1



Concrete actions

Practical exercises, simulation of cyber societies (i.e : role play, study cases...) to train students on cyber risk on an emotional and cognitive level

Discussing general issues of ethics, freedom, responsibility, dangerousness...

Your proposals ?

Working Group on e-literacy

Members of the group:

Barry Blakeley (Rapporteur)
Yvonne Buettner (Chair)
Beat Döbeli
Dirk Draheim
Michael Janneck
Alnaz Kassam
Peter Micheuz
Robert Munro
Prathiba Nagabhushan
Clara Oliveira
Ulrik Schroeder
Tom van Weert

Recommendations

R1 There is no problem for pupils who live in an e-rich environment, they acquire the competencies they need rapidly and easily, BUT we must support teacher development, which involves providing time, opportunity and training.

R2 We s hould talk to teachers in terms of innovation and encourage them to combine teaching and learning methods to offer an ICT-rich environment, within which pupils will be enabled to make choices.

R3 Pupils spend much time playing computer games; we have to find ways of using such games for 'education' purposes.

R4 We need not *teach* e-literacy but must give 'sensible' opportunities to learn, to both pupils and teachers.

R5 There should be changes in the way pupils' learning is organised, so that participants in the children's education (parents, pupils, teachers) are prepared to adopt different roles at various times.

R6 There are basic concepts in e-literacy that have to be *learned* by all pupils and teachers.

Discussion 1

What is the problem - is it the 'e' or the 'literacy'?
With reference to the 'e', is it just key-boarding, the content, or the interface? Is it about 'using' a computer, knowing what the software is used for? What is a basic level?
With reference to the 'literacy', do we mean 'competence' and if so, in what? - 'using' a computer? Is e-literacy a sub-domain of general literacy? What are the parallels with literacy and numeracy? A quoted definition which appealed to some members was "to be on familiar terms with . . .". The group agreed that just surviving is not enough, we wanted an awareness of the consequences of actions.

The problem was raised of the e-literate teacher who has difficulty with how to teach e-literacy (if, indeed, it should be taught).

The group liked a structure proposed by Heinz Moser:

Media Competence

Technical aspects	*Cultural aspects*	*Social competence*	*Reflective*
	Codes, forms of communication	*Be able with using and not using ICT*	*Reflecting about ICT in society*

Other contributions:
It was suggested that there is no problem because young people develop the skills rapidly and easily because the computer is part of their lives. In this aspect of the digital divide, pupils can teach the teacher. We should *support* teacher development, to make their own experiences. But support involves also providing the opportunity and training. When talking with teachers it may be better to talk about innovation (which must lead somewhere) and integrating ICT into their work. We need not *teach* e-literacy but give 'sensible' opportunities to learn, to teachers and to pupils.

Society is changing, so education will have to change.

Referring to Colin Harrison's Key Note - what is it about computer games that children use a great deal but most teachers don't know them or how to use them.

What about the 10 - 20% of children who cannot learn using computers? (David Woods Key Note).

Looking to the next meeting of the group it was decided to look at e-learning - are there concepts in e-learning, in computer science, that *need* to be in general education?

Discussion 2

What is e-learning?
It is not just delivery of knowledge in a cost-effective way to students, but is learning in full awareness of an ICT-rich environment.

Why should learning change?
Because e-learning is more effective.
New world, new learning.
More education is needed than we have teachers to provide, especially in developing countries.
Students are now learning part-time, often because of financial necessity, in need of life-long learning and in a situation where knowledge can be out of date in 2 - 3 years. We should make use of the knowledge students gain from the working they do (of whatever kind) while they are learning.
Learning should be in teams some of the time because learning is a social activity, but we must also remember that learning is still a personal activity.

How should learning change?

ICT offers flexibility, empowerment, change in style of thinking and an attractive, rich environment, especially for young people. teachers do not seem to have grasped this. Too many teachers equate e-learning with the web. They point pupils to look for web sites and provide no more support in searching, evaluating, structuring the approach, the information found.

We need to change the way we handle teachers and learners. We will also need to capture the imagination and support of parents to back and changes made (David Woods Key Note). The infrastructure in schools is still a problem.

How do we handle the knowledge students bring with them into the classroom, for example from their home use of the internet? Also what can be done a bout the digital divide between pupils and between classes?

Discussion 3

Are there fundamental concepts which need to be taught (learned?), for example, digitisation (so that pupils understand that a vector versus a pixel format may be at the root of a problem when handling graphics)? If so, who can show the importance of such principles? Where are they located in education?

It was suggested that learners need, rather, functional models. We need to arrange learning so that thinking takes place. Teachers as well as pupils need the space and time to think about these things.

But what about, say, the broader principle that there are many ways to represent the world? Teachers should know such principles. Perhaps we need to change the system (the management, the organisation) to meet the challenge of helping teachers approach this.

After a strong discussion the group was able to agree that there are basic concepts which have to be learned by (rather than taught to) all pupils and teachers.

What do we mean by innovation? Perhaps the moving from 'teaching' to 'learning' - but this is nothing new, only the environment has changed. It is a moving to autonomy, to a media-rich environment within which students are enabled to choose. It is an opening up of the world, collaboration.

Learning *itself* does not need to change. So what, if anything, needs to change, to be changed? We must make a change to the organisation of learning - change the way children's learning is organised - because society is changing quickly.

We need to change the relationships between the actors in the system - pupils, parents, teachers. Each actor should be prepared to adopt different roles - pupils learning from pupils - teachers learning from pupils - parents working with pupils and teachers.

Finally - the recommendations were not accompanied by a set of actions. Because of some very lively discussions there was not enough time. The actions are left as an exercise for the reader, or for the next IFIP Conference.

Working Group Discussion
Thursday 25th, July 2002

Emil Figge Str. 50
5:30 pm

ICT Agent of Change
Room 4.322

Pratiba
Blakeley
Watson
Cornu
Pilloud
Carbonnel
Van Waert
Abbott

Chair: Mc Dougall

Imported Culture
Room 3.434

Hassam
De Glivera
Iding
Farooq

Chair: Dowling

Collaborative Learning
Room 4.325

Anderson
Draheim
Cortelazzo
Roessling

Chair: Cornu

E-Learning
Room 5.424

Blakely
Munro
Van Weert
Prathiba
Döbeli
Schroeder

Chair: Büttner

Social issues / Powershifts
Room 1.246

Munro
Draheim
Piloud
Farborq
Doebli

Chair: Morel

Social, Ethical and Cognitive issues ...
Recommendations and concrete actions from DORTMUND

SEC III is an interactive conference in which each participant meet with international colleagues and explore many concepts on social, cognitive and ethical issues of ICT in education.
The programm comittee tried to ensure interactivity by integrating three interactive parts of the programm :

- *Interactive sessions*

  Provocative sessions
  During 10 min, an expert presents his own point of view on a topic and invites the audience to react
  - One notebook per teacher: A sustainable concept for a wide ICT integration in school
    Beat Döbeli Honegger, Marc Pilloud
  - Computer science as a profession in Germany: An academic perspective
    Esther Ruiz Ben, Britta Schinzel
  - Practical use of mulitmedia in teacher training
    Friedhelm Schumacher
  - Ethical apprenticeships?
    Barry H. Blakeley
  - Paradigm shift on education through thematic modeling under object oriented support
    Clara Amélia de Oliveira

- *The market place*

  Conference participants have presented view, material, ideas to interested colleagues, using whiteboards to attract and stimulate suggestions from the others (see photos)

Interactive sessions and market place bring thematics to be explore in the rest of the week in various and opened working groups discussion.
On the final day of the conference, each group has shortly presented the results of their productive and interactive work.

- *Working groups discussions*

1. **Collaborative learning (.ppt) and (.rtf)**
   Chair by : CORNU Bernard F
   Report by :KARPATI Andrea H

2. **Social issues and powershifts (.ppt)**
   Chair by : MOREL Raymond CH
   Report by : FAROOQ Muddassar DE, Pakistan

3. **Cyber risk, security, privacy (.ppt)**
   Chair by : GODINET Hélène F
   Report by : Johannes MANGENHEIM DE

4. **Imported culture**
   Chair by : DOWLING Carolyn AUS
   Report by : KASSAM Alnaaz,CA Pakistan
   to come ? ? ? ? ? ? ? ? ? ? ? ? ?

5. **From e.literacy to e.learning (.doc)**
   Chair by BUETTNER Yvonne CH
   Report by : BLAKELEY Barry UK

6. **Equity, digital divide**
   Chair by : Johannes MANGENHEIM DE
   Report by : KASSAM Alnaaz,CA Pakistan
   to come ? ? ? ? ? ? ? ? ? ? ? ? ?

7. **ICT Learning environment (.ppt)**
   Chair by : GODINET Hélène F
   Report by : ROESSLING Guido DE

8. **Virtual Reality (.ppt)**
   Chair by : Pieter HOGENBIRK NL

Reported by : Pieter HOGENBIRK NL

General remarques

The PC asked the working groups chairmen and reporters to focus more or less the whole process on three axes :

Facts
Recommendations
Concretes actions

After browsing those 9 outputs, we can see that there is strong convergence with the main objectives of most them to be discuss in the next future in the World Summit on the Information Society (WSIS Geneva 2003)

For memory :

Proposed Themes for WSIS

WSIS=World Summit on the information society

Build up infrastructure

- Role of telecommunications, investments and technologies for creation of infrastructure in an information society and reducing the digital divide

Give access to the Information society (IS)

- Reach a global access for all in the IS
- Fullfil needs of developing countries
- Information as right for everybody

Services and Applications

- Impacts of the IS on economical, social and cultural developments
- Consequences on sciences of IS

Users needs

- Consumers protection, privacy and security
- Useful content regarding diversity of cultures and rights to the communication
- ethics of IS
- Users education
- Privacy and protection in the workplace

Development of a framework

- roles of government, private sector and civil society in the definition of the IS
- Information as a good/right for everybody (public domain)
- Intellectual property right and exceptions in the law
- Freedom of expression
- Fees strategy to access to the IS and Internet

ICT and Education

- ICT as a change agent in education
- Educational environments, ICT, teachers, students and content
- Lifelong learning.

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WORKSHOP - VIRTUAL UNIVERSITY OF APPLIED SCIENCES

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Wednesday, 24th July 2002
9.00 - 10.30 am / 11.00 - 12.00 am
Chair: Günter Siegel

Virtuelle Fachhochschule - Virtual university of applied sciences

Gudrun Görlitz, Dieter Hannemann, Lorenz Hucke, Jost-Peter Kania, Debora Weber-Wulff

Abstract

The VFH is an Internet-based University of Applied Sciences in Germany that is funded as a BMBF Leading Project. The first students were accepted in Oct'01 for a Bachelor's program in Media and Computing (6 semesters/180 ECTS). A program in Industrial Engineering will start in Oct'02.
We will discuss highlights and important points that came up during use of the modules. Each represents a specific aspect of our notions of conducting virtual education.

1. **Quality Management** was a pilot module. It is based on a collection of instructional units for distance education. We investigated the amount of effort involved in moving from printed to on-line multimedia materials.
2. **Propaedeutikum virtuale** was prepared as an introduction to virtual studying. It is vital that virtual students have knowledge of the Internet and the services available. They must know how to use email effectively, how to construct and publish a web page, how to find information on the web etc.
3. The **Controlling I** module is realized as a set of multimedia and interactive self-learning units. Different interactive examples based on actual situations in companies and applied calculation exercises are integrated.
4. **Programming** is designed to teach how to program in Java. The units make use of devices such as the avatars Melanie and Marcus, who ask questions during the lectures, drag-and-drop and fill-in-the-blank exercises, matching items with self-correction and feedback, and extensive execution visualizations.
5. **InfoPhysik** is a two-module course providing students with basic knowledge of real world physics as well as with skills for the creation of virtual 3D-worlds. The main emphasis is the interrelation between basic principles of physics and their applications to the world of media and computing.

Prof. Gudrun Görlitz
Prof. Dr. Dieter Hannemann
Dr. Lorenz Hucke
Dipl.-Ing. Jost-Peter Kania
Prof. Dr. Debora Weber-Wulff

Project groups TFH Berlin / FH Gelsenkirchen

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MULTIMEDIA PROJECTS OF NRW

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Wednesday, 24th July 2002
9.00 - 10.30 am
Chair: N.N.

Two Hypertexts concerning academic and professional writing: *Schreib*trainer and *Schreib*TUTOR

Ulrike Pospiech

Abstract

Communicating by the written word is one of today's key-qualifications. But how to write, how to put down a clear and adequate text? The question is part of every-day-experience at the university as well as in many professions. It can be approached by several points of interest, reflecting the steps of writing:

- How to generate ideas, to find information and to structure the contents?
- How to argue and to (sub)divide the text?
- How to evaluate the written paragraph or chapter and to revise a draft?

The hypertext *Schreib*trainer gives answers to these questions, taking into consideration the standards of texttypes in general. The hypertext describes writing skills with a focus on written products as well as on the writing process. It can be used as an introduction or a reference book about academic and professional writing. The aim is to illustrate and to explain what one has to do, when he is writing a text.
A second hypertext, the *Schreib*TUTOR, is currently being developed. It deals with academic in different disciplines such as arts, economics, theology and linguistics and introduces to aspects of scientific perspective, technical language, text-organisation and the corresponding formulation.
Aim of the presentation is giving an insight into the architecture and the didactic principles of both hypertexts.

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Spomedial - Sports medicine interactive learning

Petra Platen, T. Abel, T. Friedrich, K. Heinen, C. Klose, S. Schneider, E. Wouters

Abstract

Teaching and learning with new media - the project spomedial (funded by the German Federal Ministry for Education and Research since June 2001) places itself to this function. All substantial sports medical contents will be edited in the context of the project by means of new media integrating media-didactic aspects. They will be available in the Internet on a platform for teaching and learning. Beside texts different tools of new media, such as diagrams, digitalized videos, 3D-animations and simulations, will enrich the presentations. The structure of the teaching and learning materials consists in modules, which are final in themselves and do not need sequential handling. At the beginning of each module contents, previous knowledge as well as the target qualifications are clarified. Exercises and test questions at the end of the modules serve as an examination of the reached success in learning.
The commercial platform (Netcoach) supports in a favourable way self-organized and independent teaching and learning. Students of sports sciences, students of human medicine as well as medical doctors in their phase of specification in the field of sports medicine are focussed as the main target group in phase one of the project.
Under the consortium management of the German Sport University Cologne, numerous heads of German sports medical institutes are co-operation partners. This community of experts ensures on the highest level the aimed quality standard of the contents. Furthermore, it guarantees the broad use of the modules and specific contents in German

universities.
Specific interests of women in online- and offline learning will be analysed and determined by questionnaires. The resultant gender specific aspects will give further input both in the creation of the modules and in their practical implementation into the platform for teaching and learning.
In future, spomedial is aimed to serve as a basis of an European or even worldwide Sports Medicine Internet learning system for all possible users, including students, teachers, doctors, and patients.

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Modeling in a Virtual World

Annika Wagner, Stefan Dißmann, Jörg Pleumann,
Gregor Engels, Ernst-Erich Doberkat

Abstract
Abstracting from real world situations and constructing an appropriate model is a crucial, but difficult task within any software development process. Thus, computer science students have to be trained in modeling and have to get experiences in modeling already during their study. The project "Modeling in a Virtual World", funded by UVM (Universitätsverbund Multimedia), a joint effort of universities in North-Rhine Westphalia, Germany, developed concepts and tools for teaching modeling even in the case of mass number of students. The talk reports about the main results of the project as, e.g., the usage of multimedia (video, animations) to suggest real-world problem situations to students, the usage of hypermedia techniques to link those multimedia objects to model elements, and the usage of conducted tool support to suggest the working in a (virtual) project environment.

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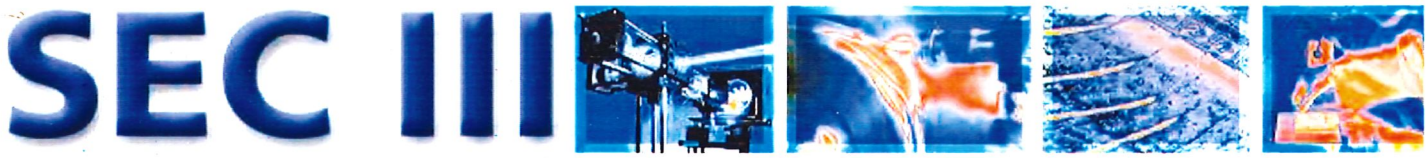

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GENDER APPROACH TO INFORMATICS

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Wednesday, 24th July 2002
11.00 - 12.30 am
Chair: N.N.

RAVI - Computer architecture visualization

Peter Marwedel

Abstract

One of the key limitations of traditional media, e.g. books, for teaching in their lack of visualizing the dynamic behavior of systems. Videos tapes and video distribution techniques have made it possible to show non-interactive media elements to students. However, one of the key advantages of multimedia systems over traditional media is their potential of providing interactiveness. This interactiveness, however, is not easy to obtain, since it requires the simulation of the systemn to be visualized. Designing simulators can be a challenging task that can not be solved within the time-frame usually allocated for multi-media projects. On the other hand, available simulators are not suitable for classroom use. They are frequently designed for optimum simulation speed and complex design projects. Ease of use, excellent visualization and portability have normally not been top goals for simulator design. Also, powerful simulators are typically proprietary and come at high costs, preventing their widespread deployment to class rooms and into the hands of students. In the following, we will describe how this problem was solved within the RaVi project. RaVi stands for "Rechnerarchitektur-Visualisierung" (German for "computer architecture visualization"). RaVi is part of the larger SIMBA-project[1] [1]

Whole text as postscript-file

[1]We gratefully acknowledge the funding of the SIMBA-project by the German ministry of research and development (BMBF)

[1] S. Schubert et al., "SIMBA home page"

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PAL - Profound algorithms

Volker Claus, Karsten Weicker

Abstract

The joint research project SIMBA addresses the development, accumulation, and evaluation of fine-grained, distributed, multimedia modules on key concepts of computer science particularly with regard to specific learning interests of women. The key concepts are general accepted topics of computer science selected based on the following criteria: gender specificity, relevance in various subject areas of computer science, suitability as curricular guideline, relevance for the personal environment of the learner, and relevance in the historical development of computer science. The developed components should be usable in curricula of computer science and more applied subjects in education, advanced vocational training, and online learning.

In the sub-project on profound algorithms, we replace the usual proceeding - to design algorithms on an abstract level and to apply them to one special problem - by the following approach. A complex, difficult problem is simplified step by step to a level where it can be solved easily. Then we run backward through the sequence of reductions and solve all these problems until we can present the solution of the original problem. There are two critical points: to elaborate an adequate and precise model of the original problem and to formulate its complicated solution as a program.

In a first module, this process is applied to the backtrack algorithm. The considered complex problem is a filling-problem (to cover a land for building with houses). This problem is reduced iteratively to thegeneral knapsack problem, subset sum, and the partition problem. The simplest problem is solved using backtracking. Then the algorithmic solution is applied in reverse order until the original filling problem is solved.

In this way we develop a module "backtracking" that contains more material than is used in a normal course. But derivatives of this large module can be extracted for several other courses and it is possible to extract good animated compact components of this module and to use it as a (small) ingredient in any other presentation.

In the next semesters we will work out six modules concerning fundamental structures of algorithms. Each module will consist of 200 to 300 (partly animated) pages. We will evaluate its effectiveness in two courses for the second and the fourth semester in the faculty of computer science.

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CB - Computer-Generated Images motivated by Augmented Reality

Monika Schröder, Sabine Volbracht, Gitta Domik

Abstract

Key issues for Computer-Generated Images include, among others, Computer-Generated Visualization, Digital-Image Representation and Computer-Generated Colour and provide important contributions to economical, technical, scientific and social fields.

The key issues allow a modular conception to create interdisciplinary courses based on different multimedia components. The modules provide different approaches and textual depth, depending on background and aspired aim of the teaching and learning party. This is also the major intention of the SIMBA project.

Many self-motivating application fields such as geophysics, medical science and banking exist in Computer-Generated Visualization. In contrast, the technology of Augmented Reality (AR) offers a new approach to Digital-Image Representation and Computer-Generated Colour. AR-systems combine the real environment viewed by a user and a virtual scene generated by the computer that augments the real environment with additional information.

The AR-technology provides a deductive approach to Digital-Image Representation and Computer-Generated Colour. We introduce an AR-scenario that presents an aid useable for orientation in public buildings, e.g., universities. This scenario combines technical aspects with economical and social fields. Consequently it allows the motivation of various user groups for the appropriate concepts. Depending on the user group the issues are accessible in different textual depth. Guided by examples and animations we will present several topics of the key issues Computer-Generated Visualization, Digital-Image Representation and Computer-Generated Colour, separated in representation parts, self study and exercise components.

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Gender Differences in Virtual Learning Environments

Christine Frank

Abstract

Demographic statistics on Internet use have illustrated that men have long been the dominant users of the Internet (see http://www.gvu.gatech.edu/user_surveys/survey-1998-10). Therefore it is clear that mainly male characteristics and habits have influenced design, application and customs of the Internet. While research shows that this gender gap is slowly closing we regard it as a crucial success factor for a virtual learning environment (VLE) to also identify and respect typical female preferences concerning general aspects of the Internet on the one hand, and concerning specific aspects of learning with the Internet on the other hand. We believe that identifying and understanding differences between student perception of Internet-based learning has two important advantages for the development of a VLE:

1. The academic institutions and instructors can apply the Internet effectively.
2. Learning can be facilitated effectively for students of both genders.

Systematic evaluation within the VLE VORMS (Virtual Operations Research/ Management Science) enables us to identify and implement features to support gender specific preferences. The main goal of this paper is to describe the concept and the results of the first instance of evaluation - which describes how expectations students have towards a VLE were evaluated. Gender differences will be the key focus.

Whole text as pdf-file

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NEW QUALITY OF LEARNING

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Wednesday, 24th July 200
11.00 - 12.30 am
Chair: Volker Kampmeier

Abitur-Online.nrw: Abendgymnasium

Eberhard Hagemeier, Karin Bödeker-Schröder

Abstract
The State of North Rhine-Westphalia has initiated comprehensive educational projects in public and private partnership to promote self-guided and web-based learning in secondary education, adult education, and in service teacher training. In line with sixth form education one corner stone of this future-oriented project is the introduction of an educational scheme offering part time distant learning courses to participants in evening classes.

Abitur-online.nrw: Abendgymnasium will represent a decentralised course based on equally shared phases of distant and face-to-face courses. It corresponds to the regulation set of the German "Abendgymnasium" aiming at the "Abitur" which is normally achieved within a time period of three years. The project management is headed by the North Rhine-Westphalian Ministry of School, Science and Research and the State Institute for School and Adult Education.

The course design consists of 50 per cent web-based GIS (Guided Independent Study) and 50 per cent face-to-face tuition organised by the schools taking part in the project. The GIS phases will mainly apply web-based resources supplied on an Internet learning platform. Apart from the mere content management the learning platform will also provide state-of-the-art facilities for communication and social interaction between the participants.
Work in progress currently focuses on three areas:

- development of distant learning (web-based) course content in 10 subjects
- development of an Internet learning platform
- in service teacher training for future online tutors (e-tutors)

Ten groups of teachers experienced in the field of adult education are developing the content base and an engaging and pedagogically sound structure for the ten subjects (German, English, French, Latin, Mathematics, Computer Science, Biology, History, Sociology, and Economics) included in the kick-off project.

The rendering of the course content into teachware either by developing new or by adapting existing teachware will be accomplished by two major German school book publishers in close co-operation with the working groups. They will also provide an Internet based learning and communication platform as well as a content management system which will contain tools for teachers to create additional customized content.

Simultaneously to the development of the subject content and learning platform 120 prospective teachers in this project receive in service teacher training supplied by a professional teletutoring service provider. The teacher training, which is taking place at the eight schools selected to run the prototype courses, mirrors the structure of the future abitur-online course. About half of the training time is dedicated to face-to-face tuition, the other half to web-based GIS work including elements of online communication. This form of training allows teachers to experience at first hand the challenge in the shifting role from face-to-face educator to online tutor.

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Results of the OECD Project, "ICT and the quality of learning" from a central european perspective

Andrea Karpati

Abstract
Many countries around the world have been making massive investments in educatonal uses of ICT without an objective feedback on its benefits for the quality of learning. Between 1996-98, the first

phase of investments, most of the government funds were allocated to hardware and Internet connectivity. The second phase of educational ICT-related investments, therefore, focus on content: development of educational software, quality assurance and promotion / evaluation of public-private partnership. The international research project co-ordinated by OECD / CERI (Centre for Educational Research and Innovation) (1999-2002) involving 23 member and allied countries, aimed at addressing some of the key issues of the second phase of "computerising" education. It was one of the few major international research efforts to prove (or, when and if necessary, disprove) the importance and effects of vast public expenditure on ICT. It revealed productive and superfluous educational applications of technology and, in the course of two-year school based case studies, monitored the development of ICT-related skills and attitudes of students emerged in the new culture.

Participating countries differed in culture and financial means allocated in education, thus providing a *variety of national models of ICT implementation and use*. Also, research intentions and practices are profoundly different - as opinions clash in workshops, the Far Eastern, European and South and North-American views on *how to assess learning* will become manifest. The clarification of policies and goals and their realisation, the discussion of test content and analysis procedures makes this project *a global learning experience* - very fitting for ICT ideology.

One of the major research areas of the project, *"Experimental studies"*, focused on two major issues. On the one hand, national research teams evaluated the functioning of those schools that incorporated ICT in their education, internal and external communication and management. On the other hand, a "quasi-experimental study" was conducted to test the development of ICT skills, learning to learn skills and ICT-related attitudes of students who are being taught with the help of new technology within the school year of 2000-2001. A network of National Research Experts was set up who co-ordinate research in their countries and consult on the centrally developed tests, questionnaires and study outlines that are intended to capture similarities and differences of educational ICT policy in the countries concerned.

This presentation will outline *results on teachers' curent ICT practices and attitudes toward computer culture* and discusses emerging models of teacher behaviour in computer-supported learning environments based on 6 Hungarian case studies contrasted with 192 cases described by the research teams of 23 participating countries. Is there a "Western" and an "Eastern European" model in introducing ICT to bring about radical transformations of schools as organisations and to develop students' abilities as independent learners? How wide already is the gap in education between the ICT haves and have-nots on the level of teachers? Is there a "digital divide" in the teaching profession and if so, what can be done to bridge that? Hungary, the only Eastern European country that participated in the OECD project, seems to be one of the global frontrunners of the introduction of ICT with 98 % of secondary schools and 40 % of primary schools having an Internet connection and 24 hour access sponsored by our Ministry of Education. With massive teacher training investments, we may have experiences that can enrich the discussion about teacher adaptability to the new, ICT-enriched educational culture.

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Finding Talented Young People for Informatics

Wolfgang Pohl

Abstract

In the last years, informatics institutes have got more and more overloaded with students, at least in Germany. It is not a problem to find young people that would like to base their career on academic studies of computer science. But it may still be a problem to get the right young people, i.e. the ones that are particularly talented, attracted to the subject.

This talk will deal with different possible ways to promote informatics among talented young people. Organizing contests is a popular instrument to achieve that goal. We will give examples of different kinds of informatics contests on national and international level, but also talk about alternatives like image campaigns and student camps and the experiences that have been made in this area in Germany.

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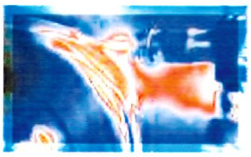
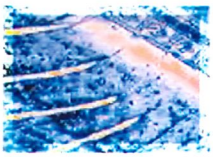
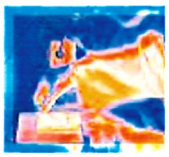

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SUNDAY, 21st July 2002

2.00 pm — Begin of registration

3.00 - 5.30 pm — Webucation at SEC III 2002
Chair: Reinhard Keil-Slawik

- "Lernstatt" Paderborn
  Raimund Michaelis
- The sun@school concept
  Thore Bahr
- What would a webucation worldwide workspace be?
  Werner Roth, Joachim Baumert
- StarOffice 4 kids - A technical overview
  Frank Meiners, Stefan Mrosh
- A teaching scenario
  Oliver Hopt

5.30 - 6.00 pm — Break

6.00 - 7.30 pm — Open keynote (all visitors welcome)
Chair: Deryn Watson

- Knowledge management in education
  Jane Andersen, IT University of Copenhagen
- Learning and Teaching in Socio-technical Environments
  Thomas Herrmann, Prorector of University Dortmund

7.30 pm — Welcome reception at the University of Dortmund
Eberhard Becker, Principal of University of Dortmund

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WEBUCATION AT SEC III 2002

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Sunday, 21st July 2002
3.00 - 5.30 pm
Chair: Reinhard Keil-Slawik

"Lernstatt" Paderborn
Raimund Michaelis

Abstract
Within this project, a lasting and standardized ICT-Infrastructure will be installed in 45 schools, contributing to education throughout the city of Paderborn. Approximately 1700 Sun Ray ultra thin clients will be installed, with administration handled by a local Education Service Provider. Administrative costs will be reduced through the use of thin client technology and standardization.
This project stems from the "Paderborner Bildungsnetz", an educational network which connects schools, the university, and the local Education Service Provider. Local area networks will be installed in each school to provide a net-based work area.

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The sun@school concept
Thore Bahr

Abstract
An increase in the number of computers has created numerous administrative problems for schools. Sun offers a reliable, scalable, and easy-to-use IT-solution called "sun@school". This platform is based on a thin client (without local data, software, or OS), and applications run on a central server, delivering display information to the client via network. The server is administrated by an Education Service Provider (EduSP). The solution removes administrative hassles for schools, allowing them to focus on the uses of IT in education.

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What would a webucation worldwide workspace be?
Werner Roth, Joachim Baumert

Abstract
Growing software for growing minds: A flexible environment adapts to different levels of learning, and a ""learning-supportive infrastructure" provides freedom of medium and location.
With StarOffice 4 Kids, the world is the schoolbag of the future. The goal of this approach is to provide a unique, sustainable infrastructure that can be tailored to schools' everyday needs. Teachers and students are able to create their own informational universes rather than being limited to the perusal of pre-fabricated documents. A network-centred approach reduces administrative burdens, and technological competence is not a requirement for use.

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StarOffice 4 kids - A technical overview
Frank Meiners, Stefan Mrosh

Abstract
In this presentation, we will introduce the basic principles of StarOffice 4 Kids, including the resolution of classic applications into XML web services. We will outline the underlying technologies, including those associated with XML such as XUL, RDF, and SOAP.
Furthermore, we will introduce the underlying concept of network-centric, with which we can replace a local desktop with a global one. The main focus of the presentation will be the description of a user interface through the use of an XML vocabulary (XUL). We will also show how to adjust the user interface to the teaching scenario. In this context, the main feature is scalability; that is, that the functions and layout are both connected with the document.

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A teaching scenario

Oliver Hopt

Abstract

From a technical point of view, there are two major problems in using computers as a media for teaching in school. The first is the administration of school computers, and the second is the non-existent software to support teaching. ASP technology offers solutions for both. The first problem may be solved by using thin clients with servers administrated by a service provider. The second problem is addressed with an example system that supports the teaching of a newsletter. In this example, the students will have a text tool, stripped down to the essential functions, and all texts written by students will be automatically compiled into one document, which can be read and corrected by the teacher.

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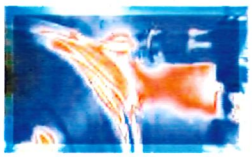
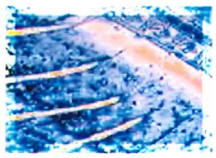
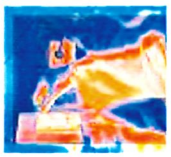

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OPEN KEYNOTE

Sunday, 21st July 2002
6.00 - 7.30 pm
Chair: Deryn Watson

Knowledge management in education

Jane Andersen, IT University of Copenhagen

Abstract

Why is integration of IT in teaching among the last things to be managed systematically at the new IT University of Copenhagen?
The newest aspects of IT are focused in researching and teaching at the three years old university. The teaching is including both theories and practical use of IT - mixed with hands on sessions. The main content of education was decided by the management of the university. Each teacher is appointed because of his or her outstanding IT knowledge, and he or she chooses the detailed IT content of their own specific subject. The IT content is adjusted two times a year.
Another ongoing IT focus-point is the development of a web-based student administration system based on research knowledge. When the IT University of Copenhagen started in 1999 there were a manager but no students and no teachers. In 2002 there are 1200 students and 150 teachers - and it will expand. The university is not born with an old paper-based system, which means that every part of the new student administration system will be used as soon as it is developed. Students are born with emails and logons to the Intranet, and mails and Intranet are two of their main sources of information during the study. The database of subjects is keeping descriptions of the actual subjects and enrolment forms for subjects. Dynamic schedules are web-based and evaluation of subject and teachers is present only at web. These digital systems are based on 100% acceptance and usage.
Concerning integration of IT in teaching the IT University of Copenhagen is doing like most other educational institutions. The knowledge on integration of IT is mainly managed individually by each teacher - and tacit. The speech will focus the actual main challenges: conditions for generating knowledge on IT integration, knowledge management, management, traditions, social relations and net-based education.

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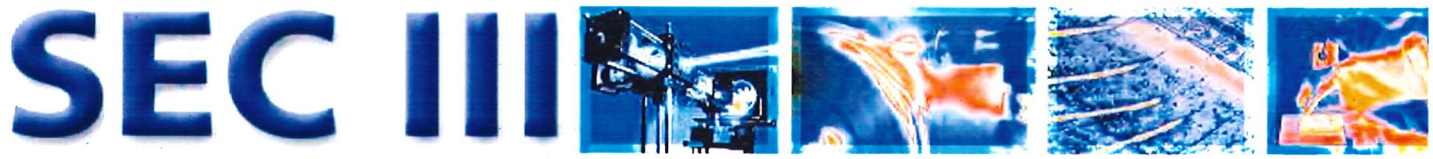

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OPEN KEYNOTE

Sunday, 21st July 2002
6.00 - 7.30 pm
Chair: Deryn Watson

Learning and Teaching in Socio-technical Environments

Thomas Herrmann, Prorector of University Dortmund

Abstract

By explicating the term "socio-technical system" in the light of constructivism, we can identify central characteristics of and challenges for technically supported learning and teaching environments. On this basis, questions can be dealt with such as:

- How can the integration of technological and organizational structures be optimized?
- How can social capital and social identity as well as reciprocal awareness be maintained and promoted?
- How can shared understanding be increased?

The answers are outlined on two levers: At first the usage of a web-based collaborative learning environment for a seminar is discussed. On the second level the requirements are described which can be related to an university if it is considered as a socio-technical system.

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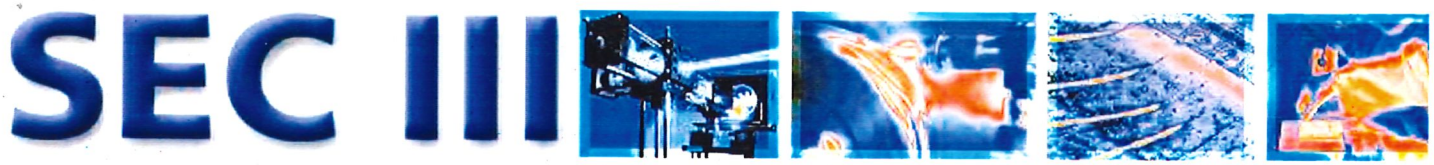

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MONDAY, 22nd July 2002

10.00 - 12.00 am **Opening session**
Chair: Sigrid Schubert

- Eberhard Becker, Principal of University of Dortmund
- Gerhard Langemeyer, Lord mayor of Dortmund
- Miriam Meckel, Spokeswoman of the Federal State North Rhine-Westphalia
- Heinrich Mayr, President of German Informatics Society

Keynote
Edelgard Bulmahn, Federal Minister of Education and Research

12.00 - 1.00 pm **Lunch**

1.00 - 2.30 pm **Paper session - Ethical aspects**
Chair: Helene Godinet

- Intelligent agents in an e-literate society: Some ethical considerations
  Carolyn Dowling
- Critical thinking and an ethical approach to studying history: The case for ICT
  Alnaaz Kassam
- A look at the impact of ICT on the informational power relationship between corporations and consumers
  Christopher Lueg

1.00 - 2.30 pm **Paper session - Curricula and teacher education**
Chair: Robert Munro

- Teacher training - the interplay of IT and society
  Christian Görlich, Ludger Humbert
- Let's teach informatics - empowering pupils, students and teachers
  Ludger Humbert
- Modern curriculum development for informatics (computing science)
  Tom van Weert, Fred Mulder

2.30 - 3.00 pm **Break**

3.00 - 4.30 pm **Provocative session I**
Chair: Hans Decker

- One notebook per teacher: A sustainable concept for a wide ICT integration in school
  Beat Döbeli Honegger, Marc Pilloud
- Computer science as a profession in Germany: An academic perspective
  Esther Ruiz Ben, Britta Schinzel
- Practical use of mulitmedia in teacher training
  Friedhelm Schumacher

3.00 - 4.30 pm **Provocative session II**
Chair: Torsten Brinda

- Ethical apprenticeships?
  Barry H. Blakeley
- Paradigm shift on education through thematic modeling under object oriented support
  Clara Amélia de Oliveira
- Beware the dreams...
  Hendrik Jeremy Mentz

4.30 - 5.00 pm	Break
5.00 - 6.00 pm	Keynote Chair: Tom van Weert ICT in education: Aspirations and tensions David Wood, University of Nottingham
6.00 - 7.30 pm	Market place I On the first day of the conference interactive sessions(e.g. provocative papers) and the market place, where conference participants will present views, materials and ideas to interested colleagues, will provide concepts, ideas and suggestions which different discussion groups will explore. The concepts and issues will be concerned with the three aspects of the conference - the social, the ethical and the cognitive dimension.

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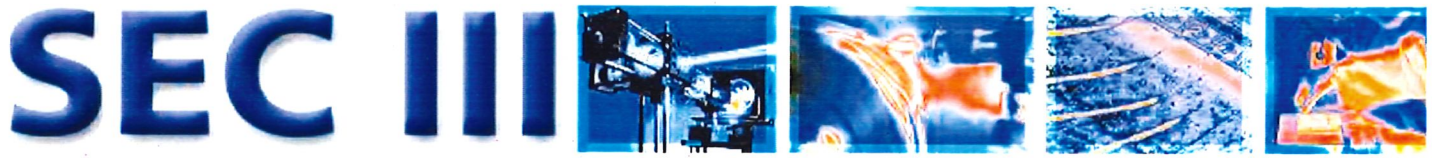

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KEYNOTE

Monday, 22nd July 2002
10.00 - 12.00 am

Keynote
Patroness
Edelgard Bulmahn, Federal Minister of Education and Research

Abstract
Information and communication technologies increasingly enter all industrial and service sectors – not only in Germany but worldwide. The rapid development has led to a large supply of highly qualified jobs and a shortage of skilled manpower. We are all facing similar challenges which are reflected in the concept of the meeting: How can we support young people's, and in particular young women's, interest in studies and vocational training in IT professions? How can we create reliable systems providing effective protection against misuse, thus building trust? What contributions can collaborations between education institutions and industry make? How can we make sure that the potential of information and communication technologies will benefit all; how can we prevent a divide between an "information elite" on the one hand and the less informed people on the other?
Each country will have to find its own solutions. In its action programme "Innovation and Jobs in the Information Society of the 21st Century", the Federal Government in 2000 defined its goals and funding priorities. Initial measures have been taken by launching the "Green Card Initiative" and an emergency programme to develop further computer science studies at German higher education institutions.
I am confident that this meeting will provide us with new ideas and that the presentations of best practices for computer science education concepts will help us to move ahead.

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PAPER SESSION - ETHICAL ASPECTS

Monday, 22nd July 2002
1.00 - 2.30 pm
Chair: Helene Godinet

Intelligent agents in an e-literate society: Some ethical considerations
Carolyn Dowling

Abstract
One of the fastest growing applications of AI research is the implementation of computer programs commonly referred to as 'agents'. Among the features distinguishing this type of software from more traditional programs are a high degree of autonomy in decision making and action, the ability to 'learn' from experience and to adapt their behaviour accordingly, and often a highly personified interface. Many are specifically designed to process complex information, make decisions and initiate actions in 'mission critical' areas of human endeavour including health, scientific research, government, business, defence, the law and increasingly in education. While in some cases we are aware of our interactions with these electronic entities, in many contexts their activity takes place 'behind the scenes', at a level not apparent to the user.

Implicit in our conception of an 'agent' both in the physical world and in cyberspace is the notion of delegation. Important aspects of this concept are our understandings of features of human interaction such as trust, responsibility, privacy and our capacity to judge competence and intention. Consideration of these issues in relation to the activities of software agents might well lead us to consider the desirability of a broadly based code of 'agent ethics'. Such a code could assist us in regulating some aspects of agent behaviour, while at the same time acting as a foundation upon which common expectations on the part of users might be formulated.

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Critical thinking and an ethical approach to studying history: The case for ICT
Alnaaz Kassam

Abstract
In this paper it is argued that the introduction of the Internet into the classroom provides a unique forum for the cultures of the world to communicate with each other, arrive at a new understanding between each other and be able to re-define views of how knowledge is formed. The paper will present two alternate views of critical thinking - the orthodox and the second cycle - and their connection to historical inquiry. The paper will show how these two approaches to critical thinking are reflected in an Internet project, which allowed 8 Canadian classrooms to study history from a First Nations perspective.

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A look at the impact of ICT on the informational power relationship between corporations and

Social and Ethical Issues in School IT Curricula and Use: The Case of Intellectual Property and Plagiarism.

Anne McDougall
The University of Melbourne

Abstract

An argument is presented for the importance of considering social and ethical issues in the use of information and communications technologies throughout the school life of a student, not only in specialist Information Technology courses but also in association with the more general use of information technologies in all areas of school learning.

The paper acknowledges wide acceptance that social and ethical issues should be included in specialist IT courses, noting that presenting these topics can be challenging for IT teachers.

Taking as an example the increased power provided by the Internet and the World Wide Web for student research activities and the associated issue of intellectual property, the paper makes a case for students to learn about social and ethical issues in association with IT use more widely throughout their school experience. The possibility is raised that focusing on the potential and power of the technology for classroom research activities, and on the technical skills needed for using it for this purpose can be associated with neglect of consideration of issues of intellectual property, the skills of acknowledgement of sources of information, and the skills of information analysis. This example is used to emphasise the importance of addressing with students a range of social and ethical issues, in classrooms beyond those of specialist IT courses.

Social and Ethical Issues in School IT Curricula and Use: The Case of Intellectual Property and Plagiarism.

Anne McDougall
The University of Melbourne

Introduction

This paper presents an argument for the importance of considering social and ethical issues in the use of information and communications technologies throughout the school life of a student, not only in specialist Information Technology courses but also in association with the more general use of information technologies in all areas of school learning.

One such issue, intellectual property in the context of student research activities using electronic sources of information, is examined at some length as an example in support of the argument for addressing these matters with the student population more broadly than in specific IT subjects.

Social and Ethical Issues in IT Courses

ICT should be analyzed not as an autonomous force, but first and foremost as a part of our culture, its values and goals. One should also ask critically how it reflects our social values and the goals and aspirations that they reflect.

(Sinko & Lehtinen, 1999, p.218)

There is wide acceptance, at least at curriculum design levels, that social and ethical issues topics should be included in specialist IT courses. Most curriculum documents and course outlines for senior school subjects in Computer Science and Information Technology include at least a mention of topics relating to social and ethical issues in the use of information and communications technologies and in the development of applications of these technologies. A recent survey of senior secondary IT courses in the Australian states and territories, for example, supports this contention (Ballard, 2001; Bowes et al., 2001; Christopherson, 2001; Clarke, 2001; Crook, 2001; Netscher, 2001).

Course outlines may of course not give a true indication of the extent, depth and types of coverage of these topics actually undertaken in classrooms. A more detailed analysis of content of texts and source materials used in these courses, of assessment techniques and examination papers, and of actual classroom practice would be needed to make a full analysis of the adequacy and appropriateness of the treatment of social and ethical issues in these courses.

For many IT teachers, handling these topics at classroom level is quite challenging. This matter has been treated elsewhere (see for example McDougall, 2001) and will be outlined here.

Rapid developments in the IT industry and increased accessibility of new technologies increase and change what students can do in classrooms. These changes introduce new social and ethical issues, challenging teachers to keep up to date with developments. It is still true that many IT teachers don't have school experience of learning their subject to draw on. Teachers of most other school subjects have experienced a variety of teachers and teaching approaches in their own student days; this is frequently not the case for teachers of IT, many of whom learnt their subject only in lecture and related settings at university or perhaps by self study. The teaching approaches appropriate for handling social and ethical issues at school level include strategies more often developed by English and social studies teachers than by the teachers who take IT classes; these include classroom debating, role plays, research using a variety of sociological sources, essay writing and so on. Many IT teachers, most of whom have scientific, or perhaps business studies backgrounds and training, find teaching these topics more difficult than the more technical aspects of the courses. Acknowledging all of these teaching challenges, it is nevertheless widely agreed that these topics should be addressed in specialist IT courses.

Social and Ethical Issues in General IT Use in Schools

The case for students learning about social and ethical issues associated with IT use more widely throughout their school experience may not appear as obvious as that for inclusion of these topics in specific IT courses. However I shall argue that it is important for all students, not just IT specialists to

have well developed understanding of ethical and legal issues relating to IT use. And I surmise further that there is not a great deal of evidence that this is actually happening consistently in schools. The reasons probably include those outlined above for specialist IT courses. However I suggest that a major cause is a focus on what *can* be done with technology - the often quite dramatic and valuable changes in what can be done with technology to improve teaching and learning in various subject areas, with less attention being given to the social and ethical implications of these developments.

Compared to the curriculum documentation and course specifications available for specialist IT courses, there is relatively little formal documentation of what is taught, or expected to be taught in the context of non-specialist IT use in schools. Some schools and systems list technical skills and competencies to be achieved by students; often these are integrated, not inappropriately, with goals for achievements in other subject areas. A particularly interesting document in this regard is the International Society for Technology in Education's *National Educational Technology Standards for Students* (ISTE, 2000), in which "Technology Foundation Standards for Students" are specified - including three items under a heading "social, ethical, and human issues":

- Students understand the ethical, cultural, and societal issues related to technology.
- Students practice responsible use of technology systems, information, and software.
- Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

(ISTE, 2000, p.14)

The Technology Foundation Standards are followed by a collection of lessons, curriculum units and activities illustrating integration of technology across the curriculum from school beginners to the final year of secondary school.

I would like now to explore the issue of intellectual property, and particularly the implications for this issue of extensive use of information technologies. My purpose is to use this issue as an example with which to build a case for the development in all students of a full and clear understanding of social and ethical issues in the context of contemporary IT use.

Classroom Research, Intellectual Property, and Plagiarism

Copyright, an issue of concern previously for a limited number of members of our society - authors, musicians, and the like - became a rather more widely considered issue with the development of the photocopier. It was extensively discussed in the context of computer use when the ease with which the earliest floppy disks could be copied opened up the possibilities of software "piracy". The development of the Internet has increased and broadened the importance of this issue and the wider matter of intellectual property.

For many years now project work and similar research related learning tasks have been valuable inclusions among classroom activities in schools. The arrival of the Internet and the World Wide Web have enabled students to undertake far more powerful searches in the time available than those possible when the main student strategies for information seeking were finding material in books or encyclopedias, and asking adults. The advent of these technologies mean that students have available more strategies and support than ever before for gathering research data and information for project work, and for organising, analysing and presenting their findings in interesting, attractive and often quite professional ways. The potential for enhanced learning associated with Internet-based research activities and the importance of developing students' research skills using information and communications technologies are widely acknowledged (see for example ISTE, 2000, p.15).

Teachers know, and students must understand that simply using the technology to find something to "cut-and-paste" into an electronic project is at least as intellectually vacuous as the occasionally practised pre-technology activity of copying two paragraphs from an encyclopedia and pasting a photocopy of the accompanying illustration onto a poster or work book. However there is an important and possibly distracting difference: the electronic version of the activity is much quicker and easier to do, and produces a far better looking final product.

Teachers also know, and students must also understand that good student research skills generally include looking for material from several sources, and combining information from these in a way that makes a new product that is the student's own. Again finding material from many sources can be

relatively quick and easy in an electronic environment. And once material from several sources has been selected and put together, the final product can appear to be very different from any of the original sources and may be perceived as the student's own.

And here, I think, lies the source of a problem. It is easy to be distracted by the apparently superior quality of the product of the multi-sourced information seeking activity, and thus to attribute to it an inappropriate level of analysis or originality. Simply selecting and juxtaposing fragments of material from a variety of sources, while easy to do and to present electronically in a way that looks very different from any of the original sources, may still involve little more intellectual effort - or learning - than the single cut-and-paste or the copied paragraphs from the encyclopedia. Further, if the final product does not include appropriate acknowledgement of all of the original sources the student is guilty of plagiarism.

My attention has been drawn in the last year or so to the matter of schools' treatment of the issue of intellectual property, in the context of cases of plagiarism at university level. It appears that some students confuse the utilisation of information from multiple sources with analysis of the information and development of their own ideas about the topic being researched. In one university plagiarism hearing, a student specifically asked how many information sources would have been needed to avoid the assignment under consideration being considered as a case of plagiarism! And a surprising number of students in these situations have proffered their experiences of school research activities as explanations for their alleged misunderstanding of plagiarist practices.

It is important to ensure that research activities in classrooms, as well as focusing on the content of the research project and the learning of technical skills for finding, selecting and presenting information, also teach skills and strategies for analysis of the information - no less than was appropriate in the pre-technology encyclopedia situation outlined earlier. Further, the appropriate techniques, conventions and requirements for acknowledgement of the sources of the information used to develop the final product from the research must be taught. And with this student understanding of relevant social and ethical issues such as intellectual property, research ethics and so on is appropriate and necessary.

Conclusion

This paper has briefly drawn attention to the importance of inclusion of social and ethical issues in specialist IT courses, and noted that generally topics of this kind do receive at least some treatment in curriculum documentation for these courses at senior levels. Difficulties for IT teachers in the teaching of these topics are acknowledged and outlined.

The argument for including social and ethical implications of the use of IT was then extended to the case of all students at all school levels. One example, the issue of intellectual property in the context of classroom research activities, was explored at some length. The possibility was raised that focusing on the potential and power of the technology for classroom research activities, and on the technical skills of using it for this purpose can be associated with neglect of issues of intellectual property, the need for and skills of acknowledgement of sources of information, and the skills of information analysis.

It is beyond the scope of the present paper to examine a range of other examples of classroom contexts and activities where a focus on what technology might do to support and enhance teaching and learning of particular curriculum skills or topics may be at the expense of careful exploration of the implications of the use of those technologies. However I hope with the illustration used here - concern about the issue of intellectual property, that a broader case is at least begun, to emphasise the importance of addressing with students a range of social and ethical issues, in classrooms beyond those of specialist IT courses.

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consumers

Christopher Lueg

Abstract

Prior to the proliferation of access to global computer networks, people were more or less passive consumers of corporate information disseminated via centrally owned and operated media, such as broadcasting, television, and newspapers. Branding is a marketing technique that has largely benefited from this uni-directional information flow to consumers from corporate information sources. Branding aims at positioning products in the consumer's mind by associating a product or service or corporation with a unique name, logo, or selling theme, such as belonging to a certain crowd because of consuming a particular product. ICT, such as the Internet and the World Wide Web, in particular, have enabled ordinary people to disseminate information to a large audience as well as to retrieve information from a variety of information sources beyond corporate spheres of influence. This means that ICT directly impact the informational power relationship between corporations and consumers. In this paper, we look at the current role of information and communication technologies in this context, and we speculate about future roles of ICT.

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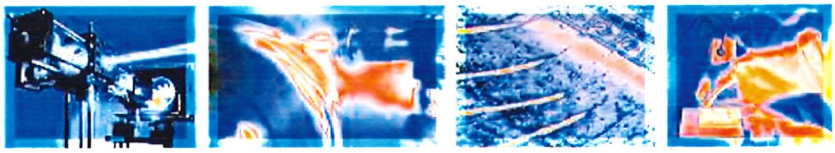

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TUESDAY, 23rd July 2002

9.00 - 7.00 pm **Market place II**

On the market place institutions from science and economy present interesting projects, results, services and products. There is e.g. an exhibition of German government informatic e-learning projects in higher education. In detail you will find the following exhibits (in alphabetical order):

- German government informatic e-learning projects in higher education
  - In2Math - Interactive elements in mathematics and computer science education
    Peter Baumgartner
  - Knowledge factory for computing systems - A XML-based multidimensional multimedia learning solution
    Denny Voigt
  - MuSofT - Multimedia for software engineering
    Klaus Alfert
  - The joint project ULI: an online course program in Computer Science offered by 11 universities
    Paul-Thomas Kandzia
- LOG IN
  Heinz Faatz
- Teaching social informatics as a knowledge project
  Iver Jackewitz, Michael Janneck, Detlev Krause, Bernd Pape, Monique Strauss
- UML-Designer
  Raphael Ax
- Virtual university of applied sciences
  Gudrun Görlitz, Dieter Hannemann, Lorenz Hucke, Jost-Peter Kania, Debora Weber-Wulff

9.00 - 10.00 am **Keynote**

Chair: Sigrid Schubert

e-Learning Technology - Convergence with the Mainstream
Colin Harrison , Director of the centre for advanced learning at IBM-Research, Zurich

10.00 - 10.30 am **Break**

10.30 - 12.00 am **Working group discussion I**

10.30 - 12.00 am **Sharing the German view I - Presentation of German projects**

German government informatic e-learning projects in higher education I

Chair: Hans G. Klaus

- The joint project ULI: an online course program in Computer Science offered by 11 universities
  Paul-Thomas Kandzia
- In2Math - Interactive elements in mathematics and computer science education
  Peter Baumgartner

ICT at schools I

Chair: Friedhelm Schumacher

- How ICT can support cooperative learning. Examples from teaching practice.
  Heinz Mandl, Katja Kruppa, Jan Hense
- Digital MaC - The use of ICT within the Brandenburg pilot project "Media and Communication"
  Michael Kaden
- Planning and implementation of an on-line supported in-serviece teacher training (inset) course - Plans and experiences from the ANUBA project

Ernst Tiemeyer

12.00 - 1.00 pm Lunch

1.00 - 2.30 pm Sharing the German view II - Presentation of German projects

German government informatic e-learning projects in higher education II
Chair: Hans G. Klaus

- MuSofT - Multimedia for software engineering
  Klaus Alfert
- Knowledge factory for computing systems - A XML-based multidimensional multimedia learning solution
  Denny Voigt

Didactics of informatics I
Chair: Peter Hubwieser

- Informatics - A new mandatory subject at secondary schools
  Elke Frey
- Mecklenburg-Western Pomerania as the first federal state sets a new course for an overall plan of computer science education in general schools
  Norbert Breier, Reiko Kretzschmar
- Small projects at the end of the first year
  Theo Heußer
- Object-oriented programming with pens and mice
  J. Czischke, V. Kampmeier

ICT at schools II
Chair: Wolfgang Weber

- Media at Your Fingertips - The EDMOND project, Electronic Distribution of Media on Demand
  Joachim Paul
- Design and Message - What are students to learn through new media?
  Andreas Möller
- Independent Learning in Mathematics or at all!
  Wolfgang Friebe

2.30 - 3.00 pm Break

3.00 - 4.00 pm Paper session - Special schools
Chair: Bernard Cornu

- ICT: an aid to inclusion? Reflections on the potential of ICT for the changing role of the special school
  Chris Abbott, John Galloway
- Various modeling aspects of tutoring systems for people with auditory disabilities
  Nelson Baloian, Wolfram Luther

3.00 - 4.00 pm Paper session - Cooperative learning
Chair: Harriet Taylor

- A role-based adaptive CSCL environment for intensive hands-on teaching / learning under rigid time constraints
  Horst F. Wedde, Frank Thorsten Breuer, Muddassar Farooq
- KOLUMBUS: Context-oriented communication support in a collaborative learning environment
  Thomas Herrmann, Andrea Kienle

3.00 - 4.00 pm Sharing the German view III - Presentation of German projects

Workshop (continues until 6.00 pm) - German government informatic e-learning projects in higher education
Chair: Hans G. Klaus

Didactics of informatics II
Chair: Peter Hubwieser

- Reformation of the vocational IT-Education in Switzerland - A paradigm shift
  Daniel Hauenstein
- Cyvoting - Voting with the internet

Peter Micheuz

ICT at schools III
Chair: Friedhelm Schumacher

- Students Developing Software in Subject-based Lessons
  Hartmut Jonas
- Genetic Engineering and Nutrition
  Jutta Menig

4.00 - 4.30 pm Break

4.30 - 6.00 pm Going further from cases I
Chair: Anne McDougall

- Integrating ICT and computer ethics in secondary education: An Australian case study
  Prathiba Nagabhushan
- Interactions in on-line learning
  Jost-Peter Kania, Debora Weber-Wulff
- Paving the e-learning road at the University of Pretoria: Policy, process, platforms and people
  Anne Strehler

4.30 - 6.00 pm Going further from cases II
Chair: Carolyn Dowling

- Edugraph: Software to teach computer graphics concepts
  André Luiz Battaiola, Nassim Chamel Elias, Rodrigo de Godoy Domingues
- Developing of informatics curricula for comprehensive education
  Valentina Dagienë
- What ist going on with informatics education in the Netherlands?
  Ard Hartsuijker

4.30 - 6.00 pm Sharing the German view IV - Presentation of German projects

Workshop (continued) - German government informatic e-learning projects in higher education
Chair: Hans G. Klaus

Didactics of informatics III
Chair: Peter Hubwieser

- Life^3: A learning environment for teaching object-oriented modelling to beginners in secondary education
  Carsten Schulte
- Functional programming as a teaching vehicle in class 11
  Herrmann Puhlmann

ICT at schools IV
Chair: Wolfgang Weber

- Teaching through Media - The Online Forum on Media-related Pedagogy
  Christian Hörburger, Udo-Michael Schampel
- Learning with Notebooks - Achieving Media Literacy and Methodological Skills through the Use of Personal Notebooks
  Michael Vallendor
- Co-operation in a Virtual Staffroom - Ideas for the Creation of Online Communities within the NRW educational web-site learn:line
  Walter Hupfeld, Michael Klein

7.00 pm Conference dinner at DASA (Famous exhibition of occupational safety and health)

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MARKET PLACE II

Tuesday, 23th July 2002
9.00 - 7.00 pm

LOG IN
Heinz Faatz

Abstract
LOG IN was founded 1981 as a professional journal for the subject of „Informatic Education" in public schools. That means, that all facts about teaching – from the basic instruction up to the scientific orientated teaching – in schools of general educational are published in that journal. Special didacital aspects are in the centre of all articles. The Inset of Computers in Schools in various meanings is an accepted postulation of parents and schools. LOG IN is a creator of a topical didactic with the contens of Computers an their applications.

LOG IN is a panel for the transposition of didactical Information, Concepts and practical Examples for the instruction in public schools. In addition LOG IN informs their interested Readers about schoolspecific Hardware, Software, Networks and Databases, as well as Fairs and Developments depending on using Computers in Schools. Each Issue of that Journal bases on the description of a special theme, which not only depends on actual facilities, but due to the special recherche keep its validity for the future. In this meaning LOG IN is the only Journal for teaching multimedia, ICT and Informatics.

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Teaching social informatics as a knowledge project
Iver Jackewitz, Michael Janneck, Detlev Krause, Bernd Pape, Monique Strauss

Presentation takes place on Thursday

Abstract
Teaching Social Informatics has to deal with the ambiguity of portraying future scenarios of technology development and use on the one hand and with harsh critics of these scenarios on the other hand. In order to deal with this ambiguity, we consider it not sufficient to merely present it. But, in our opinion, students should have the opportunity to gain experience in technology use, new forms of work organization, and related ways of organizing their lives during their studies. In order to offer our students authentic educational settings, we regard studies in Social Informatics as a "knowledge project". In this paper, we will first describe what we mean with studying Social Informatics as a knowledge project. Then we will especially focus on our efforts to develop to software systems, namely *CommSy* and <mind>, designed to support knowledge projects.

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UML-Designer
Raphael Ax

Abstract
The UML-Designer allows you structuring and presenting UML Diagrams of your software projects in Windows.

The program was specifically developed for pupils and teachers of computer science, who deal

with object-oriented development.
It makes it much more easier to develop and design any projects and decreases the time you normally raise for that part of work.

Because of this fact it was set great store by making the handling as easy and simple as possible.
Nevertheless you have all functions at your disposal, which are required to create complex UML Diagrams. Within a few minutes everyone, beginner or professional, will be able to visualize his conception.
The creation of classes, adding attributes and operations as well as drawing the links is done with a few mouseclicks.

In addition to that the tool supports you in generating the documentation and the source code. Those pieces of information you gave at creating your classes and links are used to give you the basic of the attribut- and class-documentations. You only have to append the descriptions of the attributes and operations.
The source code generator gives you the complete basic of the class-code, which you can use directly in your programming environment to add your special algorithmics.

As you can see the UML-Designer provides everything to design complex UML Diagrams quickly and easily.

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Virtual university of applied sciences

Gudrun Görlitz, Dieter Hannemann, Lorenz Hucke, Jost-Peter Kania, Debora Weber-Wulff

Presentation takes place on Wednesday

Abstract
The VFH is an Internet-based University of Applied Sciences in Germany that is funded as a BMBF Leading Project. The first students were accepted in Oct'01 for a Bachelor's program in Media and Computing (6 semesters/180 ECTS). A program in Industrial Engineering will start in Oct'02.
We will discuss highlights and important points that came up during use of the modules. Each represents a specific aspect of our notions of conducting virtual education.

1. **Quality Management** was a pilot module. It is based on a collection of instructional units for distance education. We investigated the amount of effort involved in moving from printed to on-line multimedia materials.
2. **Propaedeutikum virtuale** was prepared as an introduction to virtual studying. It is vital that virtual students have knowledge of the Internet and the services available. They must know how to use email effectively, how to construct and publish a web page, how to find information on the web etc.
3. The **Controlling I** module is realized as a set of multimedia and interactive self-learning units. Different interactive examples based on actual situations in companies and applied calculation exercises are integrated.
4. **Programming** is designed to teach how to program in Java. The units make use of devices such as the avatars Melanie and Marcus, who ask questions during the lectures, drag-and-drop and fill-in-the-blank exercises, matching items with self-correction and feedback, and extensive execution visualizations.
5. **InfoPhysik** is a two-module course providing students with basic knowledge of real world physics as well as with skills for the creation of virtual 3D-worlds. The main emphasis is the interrelation between basic principles of physics and their applications to the world of media and computing.

Prof. Gudrun Görlitz
Prof. Dr. Dieter Hannemann
Dr. Lorenz Hucke
Dipl.-Ing. Jost-Peter Kania
Prof. Dr. Debora Weber-Wulff

Project groups TFH Berlin / FH Gelsenkirchen

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KEYNOTE

Tuesday, 23rd July 2002
9.00 - 10.00 am
Chair: Sigrid Schubert

e-Learning Technology - Convergence with the Mainstream
Colin Harrison, Director of the centre for advanced learning at IBM-Research, Zurich

Abstract
The evolution of technology-based learning systems over the last thirty years has been driven by the desire to implement increasingly rich pedagogical models. This has lead to remarkable innovations in interaction, collaboration, and the use of rich-media in learning systems. However, these technology innovations have rarely been absorbed into the mainstream of information technology and consequently have failed to evolve into broadly implemented standards.

Abstractly we can view learning as a sequence of encounters among instructors, learners, and information. These encounters may be synchronous or asynchronous, local or distant, formal or informal, solitary or en masse. Today from the direction of reinventing the Web, Computer Science is seeking to develop technologies that will support a new set of Web experiences. These technologies will provide a generalized model for describing encounters among people and information and are based on open industry standards. The application space for these experience technologies will eventually include e-commerce, professional communications, games, entertainment, but learning appears likely to be the first practical application.

In this talk I will describe our approach to this problem of modelling experiences and how we intend to apply in the area of learning.

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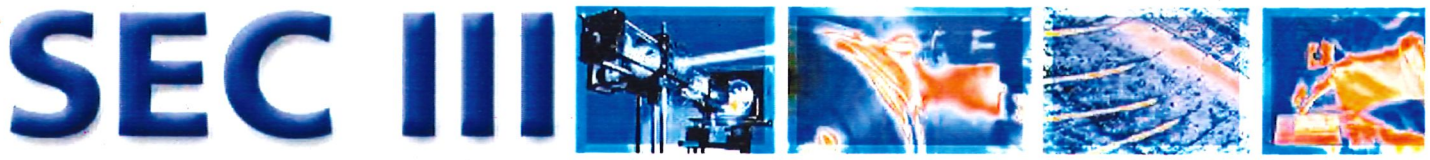

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PAPER SESSION - CURRICULA AND TEACHER EDUCATION

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Monday, 22nd July 2002
1.00 - 2.30 pm
Chair: Robert Munro

Teacher training - the interplay of IT and society
Christian Görlich, Ludger Humbert

Abstract
In their paper the authors emphasize the necessity to approach the conference's agenda with a more precise terminology and more practical as well as verifiable projects. Thus data related to current on-line learning projects could be made available for empirical research. Looking for theoretical grounding and help the authors resort to a reconstruction of sociological questions.

They are skeptical of all purely scientific approaches to the conference's topic. They argue this would be too narrow and limited in scope. They in turn draw attention to the ethical implications of this issue, in particular the potential for emancipation. They support Merton's view of the decisive role and significance of values to be observed in the present process. They follow Kuhn when asking for the options of a predominantly historical approach.

Focussing on the debate of CSCL the authors suggest three priorities - any research should consider in a more systematic and consistent way than before the individuals concerned, the constantly changing structure of social groups as well the given social context.

The authors' assumptions rely on writers like Holzkamp who have demanded a theory of learning based on the individual without ignoring the social context. They refer to the work of Foucault. According to him today's educational structures and institutions serve two functions. They guarantee the efficiency of any form of learning and simultaneously function as an element of control and social order. Any change in the CSCL's learning environment may result in fears and anxieties that have to be taken into due consideration.

The authors report on a current CSCL project in teacher training. Within the context of clearly defined academic research trainees explore and test new forms of cooperation and "knowledge management". This is done by creating and working on virtual learning stations in different places and at different times. First results indicate that educational bureaucracies and government offices need to adjust now and in the future. The authors hope that in this way more empirical data will become available for educational research focussing on the learning biography of adult learners.

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Let's teach informatics - empowering pupils, students and teachers
Ludger Humbert

Abstract
Our goal is to develop a didactical structure for informatics, so that it becomes a compulsory course for all students. This structure depends on certain fundamental elements, and these will remain in the long run. Results of curricula research on informatics in secondary education is used to decide which aspects must be included when teaching informatics as a subject. After describing the structure, we will try to answer the following question: "How to organize successful teaching- and learning-processes so as to enable students to

- take an active role in long-term learning
- know about how to express their requirements as users of modern technology
- learn not only skills but to acquire competences in using informatics systems?"

We suggest the following modular concept to fulfill these requirements. The elements have been summarized in a modular concept. This has been set up to enable curriculum constructions in allocating modules to be taught at the secondary I-level (this means K5-10) while others can be taught at the secondary II-level (K11-13). Some of the topics where proven to be taught successful at secondary I-level. These modules enable schools to determine the manner in which informatics will be taught. Studies and their research outcome are based on:

- evaluating informatics as compulsory course for 6graders at a German Gymnasium,
- evaluating a curriculum for 11th-graders at a comprehensive school and
- collecting what teachers think about teaching informatics.

Summary: how to go on, remaining questions. What we must consider is that nowadays economy is the focal point and not a mere pedagogical postulation in particular in the field of ICT. In all, there is need for a teaching process where the requirements of pupils and students are met and not where technology is the focal point.

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Modern curriculum development for informatics (computing science)

Tom van Weert, Fred Mulder

Abstract

Modern curriculum development should fulfil specific requirements which reflect developments in society. A proposed set of requirements is confronted with two actual curriculum development initiatives in the area of informatics (computing science). The two initiatives are: Computing Curriculum 2001 (IEEE-CS/ACM) and ICF-2000 (IFIP/UNESCO). Comparison shows that the principles used in these two initiatives cover the proposed requirements, although not one-to-one and with different emphasis. A difference in approach between the two curriculum initiatives, concerning the linking of societal needs and student competence development, is illustrated by explaining ICF-2000 Professional Categories and Graduate Profiles.

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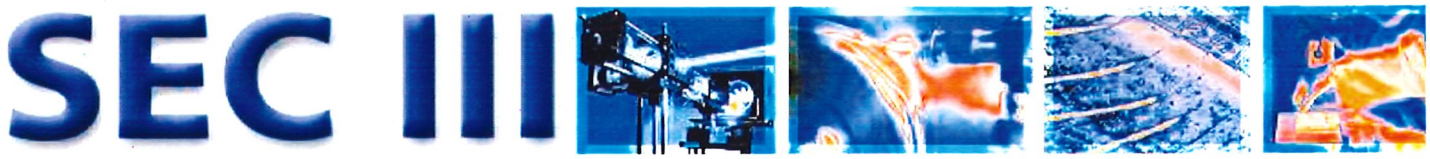

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PROVOCATIVE SESSION I

Monday, 22nd July 2002
3.00 - 4.30 pm
Chair: Hans Decker

One notebook per teacher: A sustainable concept for a wide ICT integration in school
Beat Döbeli Honegger, Marc Pilloud

Computer science as a profession in Germany: An academic perspective
Esther Ruiz Ben, Britta Schinzel

Practical use of mulitmedia in teacher training
Friedhelm Schumacher

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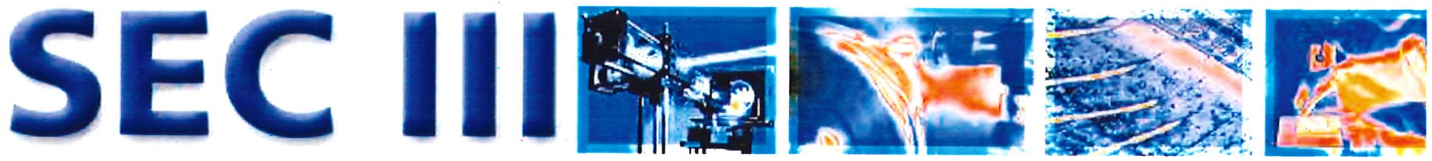

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GERMAN GOVERNMENT INFORMATIC E-LEARNING PROJECTS IN HIGHER EDUCATION I

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Tuesday, 23rd July 2002
10.30 - 12.00 am
Chair: Hans G. Klaus

The joint project ULI: an online course program in Computer Science offered by 11 universities

Paul-Thomas Kandzia

Abstract

ULI is a cooperative project of 10 campus-based university departments for Computer Science and the FernUniversität Hagen. The project's aim is a (partial) virtualisation of Computer Science studies in order to allow students enrolled in one of the campus-based universities to decouple the strict time and space constraints of their studies. A further aim is to enrich the spectrum of courses beyond what a single university can offer. The method of virtualizing traditional university courses can be characterized as follows: Start with a presentation recording of lectures, use this as the core of a web course, and enrich it by animations, simulations, self-tests etc. Emphasis is not so much laid on a media rich content developement but on virtualising the exercise part and tutorial guidance.

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In2Math - Interactive elements in mathematics and computer science education

Peter Baumgartner

Abstract

The project aims to support fundamental parts of undergraduate education in mathematics and theoretical computer science by interactive elements. An emphasis is put on the simple integration of existing teaching materials and on the interactive use of available systems.

Existing teaching materials are reused by segmenting them into small semantic units. These units can be combined into larger documents in an adaptable and selective way, also based on the user's knowledge and preferences. Tools from the domains of the courses, such as computer algebra systems, statistical software, or automated reasoning systems can be integrated in a seamless way.

The project is funded by the BMBF within the programme "Neue Medien in der Bildung". There are 10 partners from 4 universities and there are 4 industrial partners.

The talk will give an overview about project activities, the ideas behind our approaches, and on the techniques used. A certain emphasis is put on the integration of automated reasoning systems.

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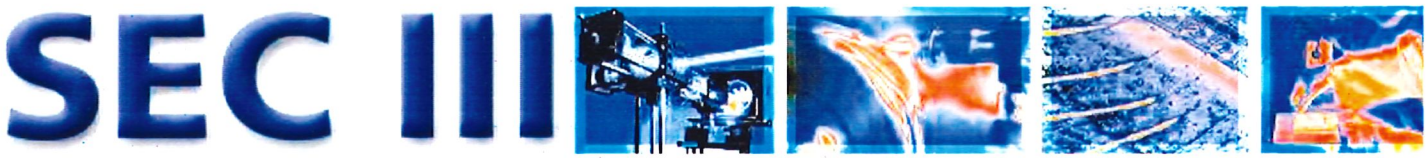

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ICT AT SCHOOLS I

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Tuesday, 23rd July 2002
10.30 - 12.00 am
Chair: Friedhelm Schumacher

How ICT can support cooperative learning. Examples from teaching practice.

Heinz Mandl, Katja Kruppa, Jan Hense (LMU München)

Abstract

In recent years, the increased use of cooperative learning has often been identified as one of the most important areas of development for school learning. The capacity for teamwork is recognised as one of the major key qualities in society. Therefore, cooperative learning is one of the main cornerstones of the concept underlying the national German programme SEMIK (Systematic Integration of Media, Information and Communication Technologies in Teaching and Learning). The aim of the programme is the implementation of ICT in schools with innovative forms of teaching and learning. This contribution will point out potentials using new media for cooperative learning by presenting examples from SEMIK schools. Conclusions for future practice will be drawn.

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Digital MaC - The use of ICT within the Brandenburg pilot project "Media and Communication"

Michael Kaden

Abstract

From 1998 to 2003 in six secondary schools in the State of Brandenburg (Germany) a pilot projects is carried out introducing the new interdisciplinary subject "Media and Communication" (MaC). Consisting of a basic course, related subjects, and a separate curriculum, MaC set out to provide students with a comprehensive knowledge of modern media. MaC includes both, the analysis and use of "classical" mass media (print, audio, film/tv) and "new" digital media (multimedia, internet). The focus of this presentation of MaC will be on its specific use of ICT and its contribution to an e-literate society.

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Planning and implementation of an on-line supported in-service teacher training (Inset) course - Plans and experiences from the ANUBA project

Ernst Tiemeyer

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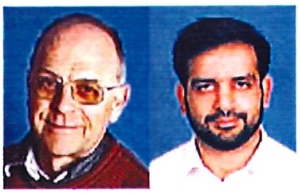
FOCUSED DEBATE

Wednesday, 24th July 2002
9.00 - 10.30 am
Chair: Hans-Ulrich Dönhoff

Towards a pedagogical framework for teaching programming and object oriented modelling in secondary education
Carsten Schulte



Nature centered design: A novel framework for engineering and science education in the new millennium
Horst F. Wedde, Muddassar Farooq

Social and ethical issues in school IT curricula and use: The case of intellectual property and plagiarism
Anne McDougall

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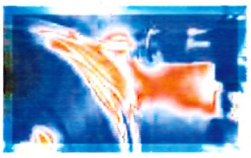
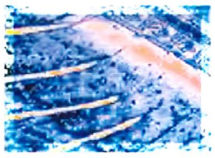
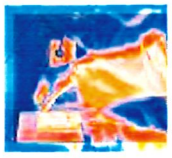

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WEDNESDAY, 24th July 2002

9.00 - 10.30 am **Focused debate**
Chair: Hans-Ulrich Dönhoff

- Towards a pedagogical framework for teaching programming and object oriented modelling in secondary education
  Carsten Schulte
- Nature centered design: A novel framework for engineering and science education in the new millennium
  Horst F. Wedde, Muddassar Farooq
- Social and ethical issues in school IT curricula and use: The case of intellectual property and plagiarism
  Anne McDougall

9.00 - 10.30 am **Workshop I - Virtual university of applied sciences**
Chair: Günter Siegel
Gudrun Görlitz, Dieter Hannemann, Lorenz Hucke, Jost-Peter Kania, Debora Weber-Wulff

9.00 - 10.30 am **"Multimedia projects of NRW"**
Chair: Ernst-Erich Doberkat

- Two Hypertexts concerning academic and professional writing: *Schreib*trainer and *Schreib*TUTOR
  Ulrike Pospiech
- Spomedial - Sports medicine interactive learning
  Petra Platen, T. Abel, T. Friedrich, K. Heinen, C. Klose, S. Schneider, E. Wouters
- Modeling in a Virtual World
  Annika Wagner, Stefan Dißmann, Jörg Pleumann, Gregor Engels, Ernst-Erich Doberkat

10.30 - 11.00 am **Break**

11.00 - 12.30 am **Gender approach to informatics**
Chair: N.N.

- RAVI - Computer architecture visualization
  Peter Marwedel
- PAL - Profound algorithms
  Volker Claus, Karsten Weicker
- CB - Computer-Generated Images motivated by Augmented Reality
  Monika Schröder, Sabine Volbracht, Gitta Domik
- Gender Differences in Virtual Learning Environments
  Christine Frank

11.00 - 12.30 am **"New quality of learning"**
Chair: Volker Kampmeier

- ABITUR-ONLINE.NRW
  The State of North Rhine-Westphalia has initiated comprehensive educational projects to promote self-guided and web-based learning in secondary education, adult education, and in service teacher training. One corner stone of this future oriented project is the introduction of an educational scheme offering part time distant learning courses to participants in evening classes.
- Results of the OECD Project, "ICT and the quality of learning" from a central european perspective
  Andrea Karpati
- Finding Talented Young People for Informatics
  Wolfgang Pohl

11.00 - 12.00 am **Working group discussion II**

11.00 - 12.00 am	Workshop II - Virtual university of applied sciences Chair: Günter Siegel Gudrun Görlitz, Dieter Hannemann, Lorenz Hucke, Jost-Peter Kania, Debora Weber-Wulff
12.00 - 1.00 pm	Lunch
1.00 - 10:00 pm	Excursion to HNF Paderborn with reception (dinner included) "ICT-Curricula for the 21st Century" Kruno Hernaut, director of education policy at Siemens AG Munich

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Planning and implementation of an on-line supported in-service teacher training (Inset) course
Plans and experiences from the ANUBA project

Author:
Dipl.-Hdl. Ernst Tiemeyer
ANUBA manager in North Rhine-Westphalia (NRW)
Landesinstitut für Schule und Weiterbildung
Paradieser Weg 64, 59494 Soest
E-Mail: ETiemeyer@gmx.de

Contents

1 ANUBA – a project to promote co-operation between learning places in vocational education

The ANUBA project (ANUBA* = Setting up and using educational networks to develop and test training modules in ICT and media professions) is a Federal Government/Federal State Commission project which takes place under the aegis of Kolibri (Kolibri* = Co-operation of learning places in vocational education) in co-operation with the states of North Rhine-Westphalia and Lower Saxony (represented by the State Institutes for School and Adult Education) and follows three main project areas:

1. As a state-specific project area in North Rhine-Westphalia the co-operative development of open learning place curricula in the media professions.
2. As a state-specific project area in Lower Saxony the development of enhancement qualifications in training for ICT professions.
3. As a cross-state area the qualification of networkers as the creator of regional educational networks.

Various possibilities are seen as instruments to set up and ensure continuity in co-operation between learning places. This includes involvement in organisation development (or school development), joint qualification of organisation members, firm organisational establishment of co-operation between learning places and questions of infrastructure (the question as to whether and to what extent new media can support the exchange of information and co-operation). The latter, for example, provides an interface to other ANUBA project areas. It is precisely through the development and use of educational networks that co-operation between learning places will probably experience a new dimension
[* German acronym for]

2. Educational networks as instruments to intensify and ensure continuity of co-operation among learning places

An educational network is seen as a network whose knots are institutions which deal with education. Such knots, for example, are schools, businesses, inter-company education centres, universities, private institutions of further education or municipal authorities as education authorities. The relations between these knots or institutions in such networks are varied in form. Without any claim to completeness, the following can be named:

- Exchange of resources such as knowledge, capital or personnel,
- power relationships, formal superordination/subordination, political influence/pressure, obtaining legitimisation, agreement,
- social relations such as friendship, respect, support
- informational relations

2.1 Management of educational networks – necessities and remit

An institution cannot permanently be a reliable partner in an educational network if the conditions in it are not right. The development in external relations, i.e. in the setting up and expansion of networks must always be balanced with the internal development of the institution. The following areas are of significance:

- Management of educational networks
- school development
- trust management
- ICT-deployment and knowledge management

Above all in network management, the deployment of instruments to solve tasks in networks is addressed, i.e. in selection (e.g. analysis of strengths and weaknesses in co-operation partners) in regulation (e.g. contract design, setting up inter-organisational committees), in allocation (e.g. distribution of network success / slack) and evaluation (e.g. acceptance by institutions and users). Here, too, basic problems in structuring networks are addressed (e.g. determining areas of co-operation, dealing with specific relationships of tension e.g. in differentiation and integration).

2.2 Professionalisation of educational networks – an important consequence

Setting up and increasing the density of educational networks in a region cannot solely be delegated to individual teachers. Although for us this is a central task for every teacher, they are supported by a professional: the educational networker:

- he supports teachers in close co-operation with the head teacher, specialist teacher and other teachers with regard the management of the network,
- he draws conclusions for school development,
- he provides stimuli for the initiation and development of trust,
- he gives support in knowledge management and ICT deployment.

To this end he has been trained with reference to problems from the practice of educational networkers and contributes to the further improvement of their training. The educational networker is an important element in a modern school in the region.

The construction of the educational networker was brought into being with the pilot project ANUBA. Creating professional management for educational networks is meant to intensify co-operation and ensure continuity after the pilot project is over.

3 Development of an Inset programme for educational network users - fundamental guidelines

3.1 General conditions and agreements

The basic initial questions which were to be settled are:

- What aims should the curriculum fulfil? (curricular criteria)
- Which constructional elements and which structure should the curriculum have? (Setting up the curriculum)
- How shall the curriculum be developed? (Organisation of the curriculum development process)
- How shall the curriculum be delivered in teaching & learning processes (multimedia teaching & learning arrangements) and examined with regard to the learning outcomes? (curriculum implementation and evaluation).

3.2 Curricular aspects of Inset programme planning (constructional elements) - determining Inset modules

Activities on developing the curriculum
Qualifying educational networkers: project phases

Project phases	Content / activities
Phase 1 development on the Inset model (curriculum construction)	• Situation analysis in the locations involved • Literature analysis • Consultation of experts • Analysis and setting up of the infrastructure "Telecommunication"
Phase 2 Testing the Inset modules (curriculum implementation)	• Implementation of Inset courses (in a modular system
Phase 3 Revision of the Inset model (curriculum evaluation and modification)	• Evaluation of the Inset course by various people involved (teachers, trainers, schools inspectorate etc. • Modification of the module system and individual modules

3.3 Organisation of the curriculum development process in ANUBA

The cross-state project area "Educational networker Inset" is promoted by four groups of networkers. These four groups of experts are made up of (prospective) networkers from both the federal states involved in ANUBA. In the outcome, numerous action fields for the educational networker Inset are differentiated. (see appendix 1)

3.4 Central idea of "On-line Inset" – combination of distance and contact learning

In contrast to usual forms of learning, the learning process in 'Distance Learning' the learning process takes place at home. In order to learn you do not have to be in a room or meet at a set time. This results in advantages for distance learning:

- Individualisation of learning (your own learning time, learning tempo, individual curricula).
- Cost reduction (no expenses for travel, accommodation or board).

E-learning is a special variant of computer-supported learning by means of distance learning. The characteristics of these digital (virtual) learning worlds are that the learning systems and learning materials used in this case

- are presented in a **digitalised form** on or via corresponding media,
- stand out through **multimediality** (different grades of complexity) and/or **hypermediality** (information interlinking).
- support **interactivity** between the learner and the system and/or – indirectly or directly – a person (e.g. tutor or coach) and/or fellow learners, either on-the-spot or (virtually) in the Internet.
- are directly available **online** in the wider sense for the user; either on his computer at home (as a rule a CD-ROM) or downloadable or usable via the Internet

It is important to record the fact that E-learning for online Inset should have different form variants though:

- tele-teaching (online teaching, web lectures)
- web-based training (on-line tutorials, tele-tutoring
- online assignments
- online discussions and
- communities

4. Working out and describing the group's action fields "Management of educational networks"

4.1 Procedure and overview

The part of the developed Inset plan on educational networkers – as the main assignment of the group of experts – is oriented towards the typical phases of the project management. The Inset modules to be developed by the group of experts are to be embedded in concrete action situations. The production of a web appearance on co-operation between learning places is planned, exemplified by a job market or mutual Inset planning of the local co-operation partners (if necessary knowledge management, too).

The whole plan:

Taking the work developed in the group of experts as a starting point, a structure was designed on the basis of which the order of events on the course is to occur and in addition a sequence agreed on for the subject matter in the blocks. This looks like this:

Basics			Specialisation
1st attendance phase Introduction and basics duration: 2-3 days	1st distance phase duration 1-3 weeks	2nd attendance phase Handling problems Outlining problems and preview duration: 2 days	project management ICT support school development trust management
Total duration	1st month		2nd – 6th month

The following action fields were assigned to the basics block: creating general conditions, initiating the use of educational networks (project management), planning ICT deployment, (ICT support), instigating contacts (trust management) and identifying and analysing the current situation (school development).

4.2 Learning environments for the on-line Inset course

The combination of other and self-direction, of social and individual focus leads to the following overview of kinds of learning environments to implement the Inset course. E-learning, so to speak, can be structured as 'emanating from different corners':

- In the first corner there are methodological structures which correspond to the concept of contemporary school as a state ruled educational authority for all citizens. Teaching & learning processes are separated from everyday life at work and in families etc., for instance with the argument that too little generalised knowledge is imparted. Influencing the teaching & learning process is left to the 'professionals'. A typical case is tutoring software which the teacher 'reproduces'. E-learning here has the advantage that it can be tailored for the individual teacher. Thus the individual learner sees advantages in comparison to 'traditional teaching' (individual learning tempo, individual learning content).
- The second corner is typical for learning in a functional field such as the workplace. At the touch of a button information from a support system is available to the learner.
- The third corner, too, is oriented towards learning in a functional field. The casual occurrence of an exchange of experiences, often not regarded as educationally relevant, is a typical example here. This methodological structuring is reflected in two of the teachers' activities. In the case of other-directed learning, priority is given to E-instruction, in the case of the more important self-directed learning, E-tutoring.

Further information in the web:
Pilot project ANUBA: http.//www.anuba-online.de
Programme KOLIBRI: http.//www.blk-kolibri.de

Appendix 1: Action fields and modules of the Inset plan

Expert group "Management of educational networks"
Action fields and possible Inset modules

Action field	Modules/content
1. Creating general conditions	• Basics of E-learning (tele-learning) • Basics of educational networks • Getting to know learning platforms
2. Initiating the use of educational networks	• Canvassing marketing instruments for educational networkers (Canvass users) • Implementing stakeholder analysis
3. Preparing projects	• Definition of sub-projects • Putting the action framework into concrete terms (field areas etc).
4. Analysing requirements and determining needs	• Target group analysis (analysis of conditions) • Determining educational needs • Selecting learning content (if necessary, acquire externally) • Structuring learning content
5. Developing teaching & learning plan and design phase	• Working out assistance in reaching a decision on the selection of distance and contact learning (time and content planning, methods planning, resources planning). • Planning media for E-learning (dramaturgy) • Structuring media for E-learning

6. Producing media	• Getting to know media tools (e.g. presentation software, web editors and authoring systems)
	• Exemplary production of media
	  • on presentation
	  • on interaction
	  • on the evaluation of learning efficacy

7. Implementing projects	• Establish and administer courses and participants on the learning platform
	• Steer teaching & learning processes
	  • tele-teaching
	  • tele-tutoring
	  • tele co-operation
	• Recording and evaluating achievement

8. Evaluating sub-projects	• Quality management and risk management in projects • Evaluation of projects
9. Ensuring continuity of project outcome	• Content management

Appendix II

Methods & media plan on the module "Basics of educational networks"

Content	Methods (Contact and/or online)	Media plan
1. Educational networks – a conceptual classification 2.Function of educational networks	Introductory contact session: Trainer's lecture, explorative, followed by discussion *or* lecture via audio or video conference followed by online discussion (perhaps only as chat)	• Information pack 1 (to prepare the participants) • transparencies • Information pack 1 (to prepare the participants) • PPT presentation
3. Success factors for educational networks	Contact session: - group work - Voting (to evaluate the significance of the aspects worked out) *or* - online session - discussion in sub-groups (chat or similar) - online presentation (short paper) by the group speaker - online voting	• Flipcharts
4. Completed educational networks	Online symposium (as a video conference) or Video recording (with interviews with experts and those involved)	
5.Organisational impact	Case work (online or offline): Case 1: tasks in setting up educational networks Case 2: Tasks within the framework of administration of educational networks Case 3: Tasks on the development of educational networks Case 4: Impact on posts in vocational schools (post "educational networker"	• Confrontation material (case descriptions with assignments)
6. Development of educational networks	Working on assignments in groups (Self-study; discussion and consolidation of chat results)	• Information pack 2: Management of educational networks • Assignment material

Towards a pedagogical framework for teaching programming and object-oriented modelling in secondary education

Carsten Schulte

University Paderborn – Didactics of informatics

Fürstenallee 11, 33102 Paderborn, Germany

Tel.: 05251/606340 Fax: 05251/606336
WWW: http://ddi.upb.de carsten@uni-paderborn.de

Keywords: Didactics of Informatics; Secondary Education; Learning Environments

Abstract: Because of changes in the field of computer science, the context and content of computer science education at school is continuously evolving. But new topics alone do not lead to concrete and suitable courses. Too often, demands of the practice obscure the underlying theory. Learning theories, didactical knowledge and computer science itself should be heeded in educational practice and the design of learning environments.
The transfer of relevant theoretical insights into educational practice is a complex and creative design process in which there are several conditions to be considered and design decisions to be made. In order to facilitate this process, a Pedagogical Framework (PF) is suggested. The goal is to bridge the gap between learning theories, computer science, didactics and the development of concrete courses and learning environments. But learning and teaching processes cannot be fostered with a cooking-recipe, a PF builds a structure that can and must be adapted to individual needs.
On the other hand, a PF can be useful as a research tool in an empirically-oriented didactic to foster the development, assessment and evolution of didactical concepts.
In this article is presented a PF for teaching programming and object-oriented modelling. The object-oriented paradigm currently has a growing role in secondary education. The twofold aim is to bring secondary education in computer science closer to scientific concepts and in parallel to enhance the contribution to general education.

Introduction

The concept of a pedagogical framework (PF) will be outlined (see figure 1), followed by a discussion of its use in teaching object-oriented modelling and programming in secondary education. The PF will also be evaluated as a tool for didactical research.

Framework is a term used in software engineering to describe a reusable software design in a way which is customizable and easily learned. Frameworks are often built out of patterns familiar to a software developer. The design is made reusable by incorporating a theory of the problem domain - which remains implicit due to the outline nature of a framework.
Just as a framework is a tool to develop software, a pedagogical framework is a tool to develop courses.
As such, it should reflect current teaching and theory. Contributions from different theoretical fields – learning theory, computer science, and didactics of informatics – are combined into one cohesive teaching strategy.
But a PF is not a simple derivation of different fields. Instead, it consists of adapted parts from multiple theoretical approaches, substantiated with information on concrete learning environments like tools, examples etc. on the one hand and concretion of theories on the other hand. This process of changing theory into a useable teaching strategy reveals the strengths and weaknesses of the theory – and as the task of the didactic is to improve the quality of the education by developing theories for teaching, a PF can be an instrument for research in didactics. But teaching is a complex process interwoven with learning activities; the consequences of design decisions made in the PF are not always predictable in the theory, but must be evaluated through an empirical study. In such a study, a teaching strategy which relies on a certain theoretical approach is evaluated, and conclusions are drawn about the theoretical background and about the PF. The PF itself is helpful in constructing such an empirical study, for it reveals links between theories and teaching concepts.
As a result of this interwoven construction and evaluation process, a PF is likely to change even at unforeseen points; to enhance changeability, a PF has two parts: the theoretical background and the derived framework, while the latter outlines a course with regard to a specific learning-environment. It describes general guidelines (the idea); requirements and examples for software development tools, didactical tools and languages (the learning environment); and rules for suitable teaching (the course). The former provides the rationale with regard to learning theory, computer science (the science of the topic) and didactical concepts.

The theoretical background of the PF

Didactical concepts and computer science

Because computer science is incorporated into current didactical concepts, there is no distinct section which describes computer science. Instead, the discussions of computer science and didactical background are integrated.
Computer science education once focused on teaching algorithmic problem-solving through programming, but its current goals have a wider scope. For instance, the ICF2000, an international curriculum framework for computer science education aiming to refer "to major widely accepted and widely implemented informatics curricula and associated resources", devoted only one of its 12 core curriculum themes to algorithms. The others are 'representation of information', 'formalism in information processing' and 'information modelling' [MW00].

The first didactical background of the PF is the 'information-centred approach' of Hubwieser/Broy [HB97]. Here, the three above-mentioned topics from the ICF2000 are the focus for computer science education at school. Students should learn by the information-centred approach to use modelling languages and tools to represent data. In this context, modelling is defined in a broad sense as the depiction of information. Object-oriented modelling languages should be taught as a vehicle for these representation techniques, and tools should be explicitly used – also to present facts outside the process of software development. The main objective is to teach the ability to produce and understand representation techniques in computer science, particularly diagrams.

A brief description of object-oriented modelling is helpful to clarify the relation to computer science. There are two main elements frequently used to describe modelling: formalization and abstraction. The objective is the development of skills necessary for the comprehension and production of formal and abstract diagrams. Formalization is a necessary element, as the goal is to build a computable model. In the end, a model consists of descriptions which are based on formal rules. Although the grade of formalism may vary in different phases of the software development process, the model is used throughout the creation of a computer program. In the end, a model can be executed on a machine.

Abstraction is, firstly, the removal of unnecessary elements which allows the developer to focus only on the essentials. To this purpose, the developer of the model must first consider the requirements. Secondly, abstraction draws out the characteristic features of the problem domain, allowing the model to be applied in diverse situations. It weakens the connection to the original environment.

In his book about object-oriented modelling, Booch refers to the idea of a complex system. Software systems should be carefully structured to deal with complexity. Object-oriented methodologies structure through the use of classes and class hierarchies, frameworks and patterns are collections of suitable structures.

As a result, formalization, abstraction and structuring are the three main concepts needed for and trained by modelling. While nearly all didactic concepts for teaching computer science or informatics in general education claim that software development should not be the primary goal in education, it is also clear that the modelling taught in school should not be incompatible with the modelling used in industry. In order to reconcile the objectives of the PF with computer science, modelling should be embedded in processes of formalization, structuring and abstraction. And this could be accomplished by teaching modelling as part of a software development process.

In the system-oriented didactics – as the second didactical background of the PF – modelling is perceived as a step in this process. The didactical concept emphasizes that every technical development is embedded in society; the focus is on considering an informatics system as a socio-technical system. From this perspective, it is clear how technical developments are related to specific intentions, thereby reaching objectives of general education theories: Students should learn to understand how their lives are intertwined with technological environments and how these technologies emerge. They must also be aware of the inherent social, ethical, and economic implications thereof [Le99]. Therefore, it becomes necessary in education to simulate processes of software development and/or to de-construct artefacts [Ma01].

In doing so, one also obtains an answer to the question of which elements are left out in the modelling process; those, which - in the view of the developers - are unimportant for

reaching the goal. In a teaching process, modelling must be combined with programming in order to embed modelling in a process of abstraction and formalisation and to relate the course to computer science. This combination is also a prerequisite which allows the implications of technological developments to become clear. Therefore, the modelling problems must have a certain complexity and should be conceptualised as group activities, just as they are in the field of software development.

Learning theory

While neither didactical approach directly relies on a particular learning theory, the approach of the system-oriented didactic refers to constructivist learning theory. In this approach, learning is actively constructed by the student, based on current and/or previous knowledge. Corresponding learning-concepts such as cognitive apprenticeship claim that learning relies on realistic contexts and authentic situations with ill-defined problems. Here, the learning-content is presented in a realistic way and the students have the opportunity to practise in a social context. Learning is also a kind of enculturation to a community of experts; students pick up the appropriate vocabulary and problem-solving strategies from experts. In cognitive apprenticeship, teachers should *model* those expert strategies by solving a problem (in our context, by performing an object-oriented modelling task) in front of the class, explaining what he or she does. Following, students attempt a problem with the guidance of their teacher, who is *coaching* them rather than instructing. By and by the teacher withdraws guidance (*fading*) and gives the students more complex tasks (*scaffolding*).

The concept of cognitive apprenticeship has been used in teaching object-oriented modelling in higher education. Tholander et al [Th99] describes a computer-based learning environment, but at school (in a 'teacher based' learning environment) the use of appropriate modelling tools and time for practise, articulation, and reflection are factors which affect the quality of the learning environment. But these cannot be prescribed. Tholander claims that learning environments should heed four points: 1) Modelling and Observation; 2) Reflection, articulation, and planning; 3) Practise using authentic tools; 4) Articulation and use of expert language.

There are some learning problems to expect:

Beginners often model with the use of physical analogies, which are limited to the perceptible environment, or in a visual way, which can prevent them from using appropriate abstractions.

A similar effect is possible with formalisation. Here, formalisation skills are not trained sufficiently by giving information on the semantics and syntax of a modelling or programming language. Instead, the use of formalisations can be described and taught as an introduction to expert language.

A third learning problem is described in [Th99]: Beginners are often sidetracked by unnecessary details. The use of "strategic scaffolding" – inherent scaffolding in the learning environment – should help them to stay on track.

These problems may be due to the fact that the students rely on their previous knowledge and the things that are well-known to them. Within constructivist learning theory it is clear that learning builds on previous experience, so the problem of finding suitable models is not simply caused by the complexity of abstraction, formalisation, and structuring. Beginners stick to unnecessary details and analogies because they do not under-

stand the goal of modelling – to build a formal and abstract structure which will serve as a blueprint for the implementation. It is also difficult for the beginner to recognize a structure which is appropriate.
Little would be gained by teaching syntactic knowledge and important object-oriented concepts first, because learning relies so strongly on context. A course in which students learn concepts one after the other and practise the syntax of the language without context would lead to inert knowledge, because they would not know when and how to apply that knowledge.

The pedagogical framework

While a pedagogical framework incorporates aspects of different theories into a single unified theory, it also provides a means for this theory to be used in the classroom. In the practical part of a PF, the theory is converted into a set of guidelines for teaching, complete with necessary tools and examples. Following is a piece of the PF for introducing object-oriented modelling to students in approximately the 11^{th} grade; it describes the general idea, guidelines for the learning environment, and finally, a suggested sequence of learning activities.

General guidelines

The general idea is to integrate the teaching of programming and modelling into one coherent teaching concept. To achieve this, three core guidelines should be regarded throughout the course.
First guideline: learning in context.
Every item should be placed within the context of a complete object-oriented implementation: i.e. a useable program. This assures that the teaching of modelling and programming skills is integrated. It also creates an authentic context in which to learn modelling steps and techniques, as well as syntactic details. Examples may be given in their entirety or developed step by step.
Second guideline: Gradually progressing formalism.
To enable students to use their previous knowledge in describing structures and processes, teaching should begin with the concrete and informal perspective, and gradually become more formal and abstract, thereby mimicking the software development process.
Third guideline: Teach only those syntactic details and programming skills which are needed in the context of the modelled example.
According to the first guideline, syntax knowledge is merely taught when needed – that is, in conjunction with examples in the course. This enables students to immediately use their new knowledge in the actual context without getting sidetracked by details irrelevant to the problem.

The learning environment

The environment should allow for gradually progressing formalism, beginning with familiar examples and using *scaffolding* to increase the level of abstraction. Very important is to *model* the goal of the modelling process.

This can be achieved by starting with the Object-Game [Be] (maybe of a board game), then introducing Class-Responsibility-Collaboration (CRC) Cards [BC89], and continuing with aspects of Unified Modelling Language (UML). The software development environment should have the ability to translate a UML-model into source code (i.e. using Fujaba). Its corresponding debugger, Dobs (see figure 2), can be a useful *modelling*[1] tool, allowing objects and their interactions to be explored graphically.

The sequence of learning activities

The course consists of three phases, throughout which the teacher's guidance gradually *fades*. In the first phase, the students become acquainted with basic concepts and the learning environment is introduced. The second phase increases technical knowledge of modelling and programming, and introduces a library to build graphical user interfaces and event handling. In the third phase, students learn and practise autonomous modelling and programming. The three phases should provide strategic scaffolding.
The first phase introduces the expert language, tools, and *models*[1] object-oriented modelling. Students' previous knowledge can be applied by using examples familiar to them, such as board games. The Object-Game should be played to introduce the basic concepts of object-oriented models. The implementation of the model is shown and can be further explored by the students in Dobs.
In the second phase, students gain practice modelling. In a new example, students create a CRC-Model, test it with the Object-Game, and formalise it in UML, all with the guidance of their teacher. The model should then be implemented, thereby introducing more syntactical details of UML and the chosen programming language. Once the model is implemented, the teacher *models*[1] how event handling and a GUI can be added.
In the third phase, students work in pairs or small groups to create a self-contained program with graphical user interface. At this point, they finally work without the guidance of their teacher, allowing them to gain a deeper understanding of the development process and the way in which tools and modelling techniques fit together.

Results

At the time of writing, the PF described here is currently being evaluated in an empirical study. Preliminary results of the study indicate that students are able to build their own models, to use the tools, syntactic elements and language concepts – as well as the abstractions and structure they learned from the given examples. In accordance with the chosen learning theory the students often rely on certain characteristics of the first presented example. This is due to the importance of previous knowledge. In later phases of the course, students should get to know, discuss and evaluate alternative solutions; pattern catalogues and the idea of refactoring [Fo99] are useful sources for planning the next teaching steps. The PF should stress the importance of the first presented object-oriented model used, focussing on its necessary features (see Be]). In the study students first saw a modelled board game: three classes, one instantiated several times.
The methods of the classes worked by manipulating associations (see figure 2), thereby emphasizing the idea that oo-software works through interaction between objects.

[1] ..as it is used in cognitive apprenticeship.

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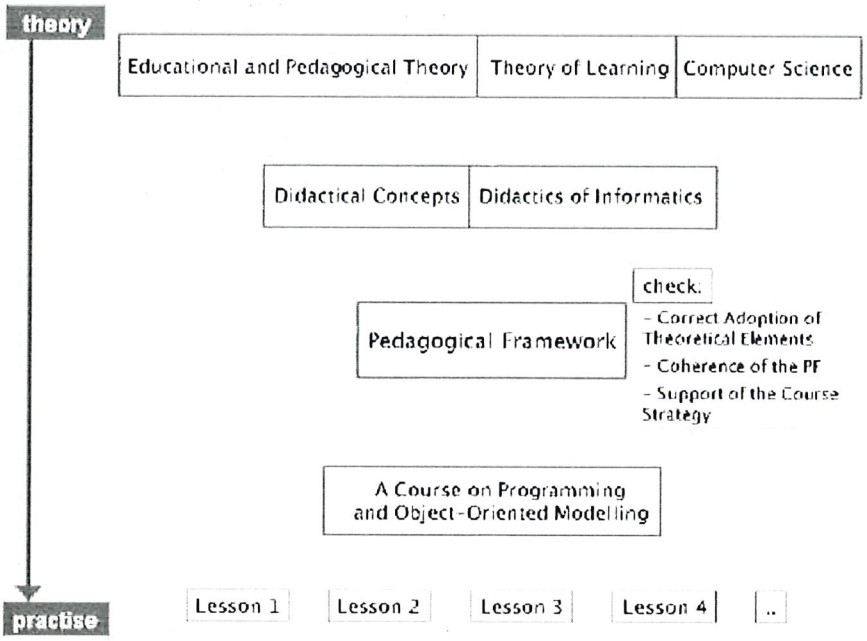

Figure 1: Constructing a Pedagogical Framework to bridge the gap between theory and practise

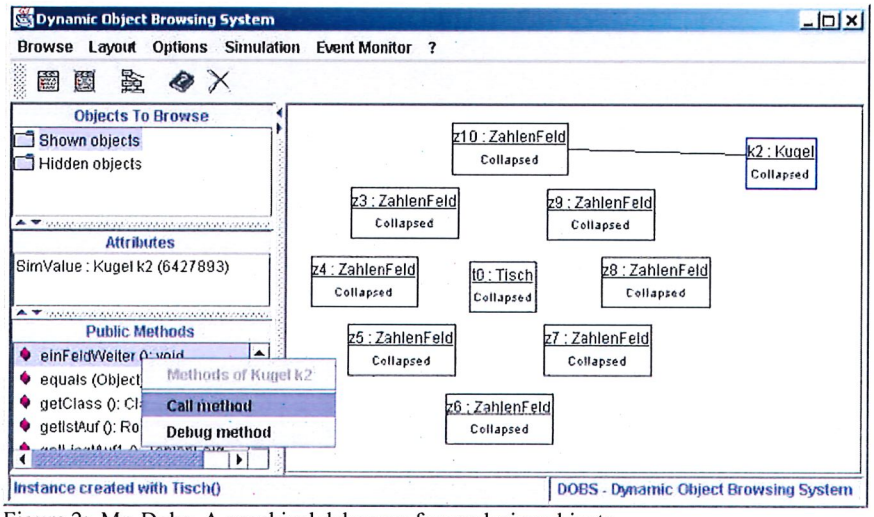

Figure 2: Mr. Dobs, A graphical debugger for exploring objects

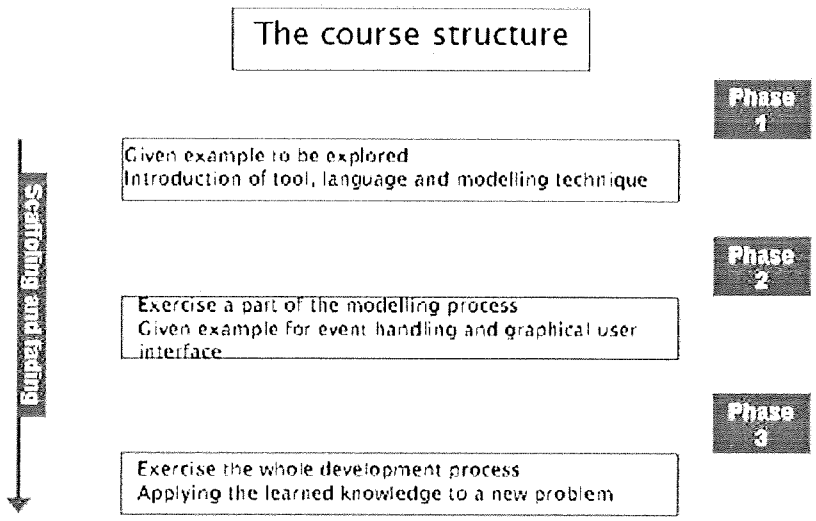

Figure 3: The three phases of the course

ICT—agent of change and social conflict

Nature Centered Design: A Novel framework for Engineering and Science education in new millennium

Horst F. Wedde, Muddassar Farooq
Informatik III
University of Dortmund
44221 Dortmund, Germany

phone: +49-231-755{-5322, -5325}
fax: +49-231-755 5323

{wedde, farooq} @ls3.cs.uni-dortmund.de

Abstract

Technological developments have brought a substantive revolution in human society. The famous motto of the Chicago fare "Science finds, Industry applies, Man conforms" has undergone a tergiversation to "People propose, Science studies, Technology conforms". This change of mind resulted in evolving novel design methodologies that ultimately resulted in an extensive research, initially in Man Machine Interfaces and later on in Human Centered Systems [ND86][No93][No95]. This transformation of design philosophy is a right step in the direction of developing soft and humane systems that are human centered. However, this design approach extracts itself out of resentment against the machine-centered approach. Since this philosophy puts human at the center of the design process and machines at the periphery, therefore it received an egregious approbation in the community of designers. In this paper, we want to propose a novel design approach namely Nature Centered Design as a true replacement for Machine Centered Design. We believe that Human Centered Systems are one limiting case of Nature Centered Systems. We believe that a technology based on the principles of Nature can bring tranquillity and harmony to a society. We had around us marvelous manifestations of Nature in the form of animal and plant kingdoms, a harmonic system of oceans and rivers, clean and healthy atmosphere to breath, and a wonderful solar system. These wonders of Nature were not used to cope with awe as a driving impulse to awareness and consciousness of a designer. If we explore Nature and try to understand design principles and processes in natural objects and apply them in designing industrial products, then this may lead to an evolution of a technology that integrates into our daily life, we call it natural technology. A natural technology produces objects that are integrated into our ecological system as familiar natural objects i.e. like trees, fountains and flowers. We call this design process Natural Engineering. We also propose a framework for gradual integration of this approach into the existing Engineering and Science education. Hence the motto for the technological revolution in the new millennium, as we propose is "Nature proposes, Humans discover, Technology conflates".

Keywords

Building design, Values, Social Issues, Responsibility

Introduction

Technological advancements in the last century transformed human society from the Iron Age to the Information Age. In earlier part of the century, airplanes brought revolution in transportation and in later computers made such an impact on society that it is even difficult to articulate its repercussions. However, this brought with it an overwhelming interest in machines that replace manned skills to improve the productivity of industries. That will ultimately result in maximizing the profit. During this phase, less attention was given to the design principles and the long-term impact of the industrial products on society. However, with the passage of time, people started realizing that this resulted in Machine Centered Systems in which

humans were blamed for being disorganized, emotional, and distractible while machines being orderly, unemotional and non-distractible. However, designers started realizing that they needed human centered view of the design process in which humans are considered as creative, compliant, attentive to change, resourceful and have the ability to take flexible decisions by considering the variety of circumstances into account. In contrast to this, machines are dumb, rigid, insensitive to change, unimaginative and take only consistent decisions on numerical computation of context free variables [No93]. This approach resulted in Human Centered Systems in which machine aid humans to do their job satisfactorily and effectively without causing anxiety and tension. Purpose is to subdue machines to human purposes.

We believe that the transition to the human centered approach is a step in the right direction, but nevertheless far from being a comprehensive one. The reason is that it does not consider in its design process, Nature, which is a key and important concept. In next sections we will try to explain what we mean by Nature Centered Design, the key concepts and definitions perceived. Towards the end of the paper we propose an educational framework for gradual inclusion of the Nature Centered Design into the existing Engineering and Science education. We think that this stepwise treatment will enable students to understand the laws of Nature and then apply them in designing the industrial products.

Philosophical foundations and goals

How many times have we been baffled with the traffic direction in different countries? Most of the people, who arrive in Germany from England, stand on the wrong side of the road to catch a bus. If the road is not a busy one, they might wait until the bus arrives and then it is too late. Many novice passengers face a similar problem with escalators that stop automatically. Once they try to use it, it starts in an opposite direction. On the contrary, many people are cognizant of the upstream and downstream direction in a river by just looking at it. Why could designers not develop systems on the same principle that the roads tell direction of traffic flow and similarly escalators tell the intended direction of the ascent/descent? People can cheer the invitingness of a beautiful landscape and a romantic colored flower field for hours. The more they look at these, the more thought provoking it is, and the more relaxed and comfortable they feel. However, on the other hand, they are fatigued quite easily in an hour or so with computer displays as their eyes become strained, and with every passing moment, the ability to creatively think diminishes. Why are our computer monitors not like flowers or trees that enhance our thinking process without this process being distracted? These and many similar examples reveal that it happens because designers are not aware of small wonders that surround them. *They are not used to cope with awe as a driving impulse to awareness and consciousness of the designer in the design process.*

A typical tamed lion in circus recognizes its master and performs different feats on his commands. However, if some naive stranger will try to approach it, the lion might even attack him. Why were our airplanes not designed on this principle of discrimination between a master and stranger? A catastrophe like that of Sept 11, 2001 might have been easily averted. If the flight control system had been able to recognize the terrorists as strangers it might have turned off manual control of the aircraft and automatically redirected to, and landed on the closest airport. In this context we would have put too much blame on the terrorists, but the technological community must accept our design faults as well. We believe that some blame rests on the designers who tolerated the misuse of their technology.

Plants help in providing oxygen to the members of animal kingdom while animals provide carbon dioxide to the members of plant kingdom. This simple principle of harmonious mutual support was violated during industrial revolution or we say "industrial misadventure". This resulted in ruination of our environment and ecology.

Another simple principle of Nature that we are oblivious of is "Nature gives a limited amount of optimal abilities to a creature so that it can perform its specialized natural or biological task accurately and precisely." In contrast to this most of the automobile companies provide cars with the capacity of driving at 200km/h yet in most of countries speed limit is approximately 120km/h. The high relative speeds result in accidents that may have been easily avoided.

We believe that the above examples, although they do not even display the tip of the iceberg are conclusive enough to put efforts in a heterodox approach of Nature Centered Design.

Nature Centered Design-----Formal Specification

To our knowledge this concept has not been formally discussed at any level, hence we just define our view of it. The main message of this contribution is that designers become conscious of aromatics of Nature and use them in Engineering. Once people start realizing the importance of this pedagogical approach, then it might evolve as a comprehensive research area. As the number of researchers contributing in the multitude of encompassing dimensions increases then terms and their definitions evolve as formal concepts.

In rest of the paper we try to answer the following questions on the same pattern as in [KS98]

- What do we mean by Nature?
- What is a System?

- What do we mean by Nature Centered Systems?
- What are the goals of Nature-Centered systems?
- What are the responsibilities of the designers involved in this design process?
- What are the different areas involved in it, in case we want it to be taught as a formal field of specialization?

What do we mean by Nature?

Nature (N) is the guiding force behind the order in the Universe and formulates laws known as laws of Nature.

Laws of Nature (L_n) are either statements of the regularities in the universe i.e. mere descriptions of the way the universe is (Regularity Theory), or are principles which govern natural phenomena of the world i.e. natural world "obeys" the laws of Nature (Necessitation Theory). However, both theories agree that laws of Nature

- are factual truths, not logical ones
- are true for every time and every place in the universe
- contain no proper names
- are universal or statistical claims
- and are conditional claims, not categorical ones.

For more details please refer to [Ar83].

Entropy of Nature (E_n) is the order that Nature maintains among natural objects so that the overall order of the complete universe is regulated. The order increases as the entropy increases.

Natural Objects (O_n) are objects that have the optimum number of attributes to perform their intended natural tasks by following the laws of Nature. During this process they produce waste that do not significantly disturb the entropy of Nature.

Capricious Objects (O_c) are natural objects but with the exception that they might follow the laws of Nature at one time, however at another time they might digress.

Alien Objects (O_a) are objects that do not have the optimum number of attributes to perform their intended tasks. Most of the times they perform their intended tasks by producing waste that decreases the entropy of Nature to a non-tolerable limit. These objects are alien to natural objects.

Monotony of Attributes (M_a) represents the degree of similarity between the attributes of natural objects and alien objects. A value of 1 shows perfect similarity with the attributes of natural objects and 0 shows complete dissimilarity.

Digressiveness of Actions (D_a) is the deviation from the laws of Nature that alien objects do in performing their intended tasks. A value of 0 shows total compliance and of 1 shows total non-compliance.

Cohesiveness of Objects (C_o) is the ability of an alien object to conflate into Nature like a natural object. It depends on the monotony of attributes and the digressiveness of actions of an alien objects.

Conflation Principle: Degree with which alien objects can conflate into Nature (C_a) is directly proportional to the monotony of attributes and inversely proportional to the digressiveness of actions of an alien object

$$C_a \propto f(M_a) / f(D_a)$$

As M_a varies from 0 to 1, $f(M_a)$ also varies from 0 to 1, however as D_a varies from 0 to 1, $f(D_a)$ varies from 1 to 0. Our focus at the moment is to evolve an empirical formulation rather than that a purely mathematical one.

- If $D_a = 1$ and $M_a = 0$, all we can say that such an object will effect Nature in an unpredictable and non-quantifiable manner. But we believe that most of the machine centered products do not even have these values because they are produced from natural objects and they do follow some laws of Nature, hence the only hope that such objects could only have been produced by alien creatures.
- A similar logic holds, if any of these parameters take the limiting values, separately.

A Natural System is a system that applies the laws of Nature onto natural objects so that they interact with other natural objects in an ecological community and this interaction has a minimum effect on the entropy of Nature. They are interconnected to have ecological relationships so that they complement the tasks of each other. It is possible that in such a system, the entropy of a single natural object or a group of natural objects, decreases but the overall entropy of the Nature does not decrease in an uncontrolled manner.

An Alien System is a system in which alien objects often do not interact with each other and with natural objects in a congenial fashion, and that results in an abrupt decrease in the entropy of natural objects on one hand and of the natural system on the other hand.

Most of the systems that we have, because of adopting the machine-centered approach, are alien systems, in our view. These systems interacted with our environment (it consists of natural objects) in a non-congenial fashion, and ultimately resulted in the complete destruction of our precious natural heritage. The problem in our view is that humans are neither natural objects nor alien rather they are capricious objects. Hence, if they want, they can create

alien systems, as they have been doing that quite frequently in the last couple of centuries.

What do we mean by Nature Centered Systems?

Ideally Nature Centered Systems are aliens systems created by capricious objects with $M_a = 1$ and $D_a = 0$. In this limiting case, they are perfectly conflated into the ecological systems.

Nature Centered Systems are alien systems created by capricious objects with $M_a = \alpha$ where $x_1 < \alpha \leq 1$ and $D_a = \beta$ where $0 \leq \beta < x_2$, where x_1 and x_2 are bounding values for the conflation. If α drops below x_1 and β increases beyond x_2 then system is degraded to the category of an alien system.

We believe that in human centered approach, capricious objects are placed at the focus. As discussed, humans have a dual status; they are natural objects as well as capricious objects. Once they interact with an alien system (they are regarded as natural objects) that has low monotony and high digressiveness, the latter one decreases their entropy, and this ultimately results in a non-pleasant experience with the system. However, the human centered approach places these capricious objects at the center, which in the first place, are responsible for decreasing the entropy of Nature when in a designer role. In our approach, humans are asked to behave and respect the laws of Nature for the overall order of the world. This awareness is needed in all communities that are responsible for technological design the technology and its realization. However, most of the research done in Human Centered Systems is still valid according to our approach. We consider computers as alien objects and humans as natural objects. All efforts, we believe, are focused in increasing the cohesiveness of computers into our society. However, we think, an ideal solution is being merely become so cohesive that they conflate in Nature, rather than in human workplace. This will help us in protecting Nature, which is the benefactor of all natural objects including humans. The real difference is that Human Centered Systems want to increase entropy of human beings only, though it might result in over all decrease of the entropy of Nature. However, we want to take a more comprehensive approach in which the entropy of Nature takes precedence over a group of natural objects.
Autonomous Decentralized Systems (ADS) is a concept proposed by Kinji Mori. He was fascinated with the structure and the functionality of cells in human body. He applied the concepts learnt during his exploration of physiology to distributed systems. He proposed the concept of "Autonomous Decentralized Systems" which are like that of (biological) living systems i.e. a network of autonomous subsystems. In Mori's view all organisms in the human body extract the information from the circulating blood and put the information into the blood that is needed by the other organisms. He proposed the idea of a data field into which each subsystem puts it s information with a content code and any another subsystem can extract the information based on the content code as well. There is no need for sender and receiver addresses in the protocol packet. For further details please refer to [Mo93]. ADS concept further validates our approach, though this system only tries to reduce the digression, one aspect of the Nature Centered Systems. We believe that as this design approach is extensively explored and researched upon we will have order of magnitude better systems than that of the ADS.

What are goals of Nature Centered Systems?

We believe that Nature Centered Systems will strongly contribute to in achieve the long dreamed goals envisioned by Mankind such as world peace, medical and psychological health care, adequate nutrition and housing, safe transportation, protection of ecological system, effective education, effective education, access to communication and information resources, freedom of expression, support for creative exploration, privacy protection, socially constructive entertainment and Sports [Sh99].
We think that once we take a Nature-centered approach, most of these goals are realizable. Building such systems might even need long-term investments but this will make our planet an enjoyable lively place to live in for our future generations. Hence we propose following **Declaration of Responsibility** inspired from [Sh99]

- We the researchers, designers, technology developers undertake that we will do operose efforts to bring the awareness into our communities about the importance of making Nature Centered Systems. We will act as the guardians of natural objects and only design and produce alien objects that live in tranquility with natural objects.
- We will make a common insurrection against market-oriented products that form an alien system. We will behave as sensitively in our design as surgeons do in their operation. We believe that designing a product is an act of surgery in which we introduce an alien object in Nature, and this shall not happen at the cost of decreasing the entropy of Nature. After all Nature is our best benefactor.
- We agree to prepare a Natural Impact Statement at the start of every project. This will identify natural objects with which our system interacts, and establishes the requirements and processes that need to be adopted for the conflation of the new system into the ecological system.
- We stand committed that we will not apply the laws of Nature to benefit a few capricious objects at the cost of other capricious objects or natural objects.

Natural Engineering--- An Educational Framework in new Millennium

We have invented this term to reflect the enterprise in which designers are engaged in. This is neither pure natural Science nor pure Engineering. The definition of this term is a bit vague because of the wide range of disciplines involved. We think that studying the laws of Nature and the laws of Science will give a better comprehension about natural objects, and by means of this cognition we cogitate Nature Centered Systems: Systems that conflate within Nature because of their cohesiveness property.

However to decide upon a framework of the areas that will produce Natural Engineers is an uphill task in its own. But we think that we can at least just mark the general framework and then open it for discussion among the community of researchers, philosophers, designers and entrepreneurs. Study can be divided into five core areas.

- Natural science subjects such as physics chemistry, biology and mathematics.
- Social science subjects such as philosophy, psychology, sociology and theology.
- Medical science subjects like anatomy and physiology.
- Ecological science subjects like ecological system, environment, botany and zoology.
- Engineering science: to study any discipline of Engineering where Natural Engineering will be applied.

From the discussion above it is obvious that Natural Engineering requires an extensive and in depth knowledge of multiple disciplines. An academic degree (M.E.) in Natural Engineering might take more than 14 semesters of studies in the American system of education. Moreover, at the moment it is a bit premature to formulate such a program. Hence we propose a gradual but objective oriented modification in the existing Engineering and Science education. We divide education framework into three distinct phases.

- **Phase 1** Augmentation of the existing education
- **Phase 2** Evaluation and Refinement
- **Phase 3** Natural Engineering as a distinct discipline

Phase 1 Augmentation of the Existing Education

The purpose of this phase is to introduce into the existing Engineering and Science curriculum several subjects. We conceive the following five objectives for this phase

- Awareness among the engineers and scientists about the importance of Natural Engineering
- Inculcating in designers the ability to analyze natural laws and apply them, if possible, to their own area of interest.
- To focus more on the application of principles rather than the theoretical treatment of the involved areas.
- To serve as collaborative agents for cooperation in the interdisciplinary research.
- To have a strong ethical commitment to designing and building Nature Centered Systems.

Hence we propose the introduction of the following subjects in a standard Engineering and Science education curriculum

1. **Fundamentals of Ecological Systems:** This course will teach the basic principles of the ecological system, environment protection, the food chain and the interaction among ecological entities.
2. **Fundamentals of Medicines:** This course will give students the basic understanding of the human anatomy and physiology. More emphasis is on learning the biological structures and their functional principles rather than a full treatment of the area.
3. **Anthropology:** This course will highlight the basic principles and issues in psychology, philosophy, theology and sociology.
4. **Nature Centered Design:** This course will give an introduction to history of industrial evolution from the Machine Centered Systems to the Human Centered Systems. Then it will elaborate the issues in Nature Centered Design and will enable the students to apply the laws of Nature to the design in Technology.

Phase 2 Evaluation and refinement

This phase will evaluate the feedback of the students and instructors involved in teaching Nature Centered Design. The emphasis will be on the result-oriented application of the principles towards research projects. The progression of the research projects and the feedback from the students and instructors will help in evaluating the objectives set for phase 1, and then apply reengineering principles to adapt educational processes. This might result in readjusting the course contents or even in introducing new courses. This will also serve as a platform to launch Natural Engineering as a discipline in phase 3.

Phase 3 Nature Engineering, as a distinct discipline

The birth of this phase depends on the deductions made after the critical analysis of the results in phase 2. If this design approach is considered provocative enough then Natural Engineering can be offered as a separate stream in an Engineering school. Complexity to plan and execute such a program can be gauged from the number of departments involved in the stream. Initially, we estimate that onerous studies of 14 semesters are needed. It will be an uphill task to motivate the students to commit themselves for such a long course of studies. We propose a stepwise progression

1. In first four years of studies, students will be given an option to specialize in any two of the above-mentioned five areas and get two bachelor degrees.

2. After that they will be offered three one year specialized modules. At the completion of each module, they will get a bachelor degree in the area of specialization.
3. At successful completion of all five units, they will get a Master of Philosophy (M-Phil) degree in Natural Engineering.

We believe that this modular and stepwise treatment will give the students more freedom and flexibility to manage their studies. This will count for a process of cross-fertilization arising from the expertise in different disciplines, and stimulate it by the insides into the principles of Nature Centered Design. After seven years of rigorous education, they will have the ability to analyze the impact of an alien system on the entropy of Nature in all aspects and then give the expert feedback on the adaptation of the system.

Conclusion

Technological advancements in the last couple of centuries have not only transformed the anthropological treatment of the social interaction but also enlightened the importance the man machine interaction. This lead to an immense interest in the subject and five scientific journals in the area are a clear manifestation of the enthusiasm among the research communities. We believe that the Human Centered Systems philosophy is a step in the right direction, but does not provide a comprehensive treatment of the issues involved in the design process. We propose a novel approach of Nature Centered Systems that derives its impetus from the order and equilibrium in Nature. We believe that the laws of Nature are to be explored and respected in a more regular way. We think that two types of objects are to be emphasized in dealing with design in Technology. Natural objects perform their intended tasks by following the laws of Nature with optimal attributes; and alien objects do not really follow the laws of Nature, hence decreasing the entropy of Nature. Our design approach suggests that we should design systems in such a way that alien objects cohesively conflate with natural objects. The degree of cohesiveness depends on the monotony and digression of an alien object. We believe that an ideal Nature Centered System will have a maximally achievable monotony and a minimal digression. This will result in a natural interaction with such systems and hence fatigue, agony, and frustration as they attend the use of technology can be reduced.

We discussed that Mori has applied the principles of the cell theory and the human blood circulation system to distributed systems to have Autonomous Decentralized Systems (ADS). We have proposed Natural Engineering as a field of specialization in which principles of Nature can be applied to Nature Centered Systems. In this regard, we proposed that engineers are made aware of the natural principles so that they can apply those principles to the design of industrial products, ranging from industrial plants to computer systems. However, most of the research focused on Human Centered Systems is still valid because the computers are alien objects and humans are natural objects. This approach tries to increase the monotony and decrease the digression of computers so that their cohesiveness into human society increases. We also outlined a framework of imparting its education to the designers. This will count for a process of cross-fertilization arising from the expertise in different disciplines, and stimulate it by the insides into the principles of Nature Centered Design. We also hinted at the responsibilities that a Natural Engineer must fulfill. Last but not the least, this is just a beginning of an altogether new approach to Engineering and Science education. So as more researchers and educators commit to this approach, new dimensions and horizons will be explored.

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Meeting of the International Programme Committee for the SECIII Conference (Dortmund 2002)

Held at Dept. of Educational Studies, King's College, London

Wed 30 January to Fri 1 February

Present
Prof. Deryn Watson (chair); Yvonne Buettner, Volker Claus, Hans Decker, Helene Godinet, Johannes Magenheim, Raymond Morel, Bob Munro, Sigrid Schubert, Tom van Weert,

While a detailed agenda had been tabled the Committee did not try to go through it in order - rather they focused on different issues on different days. It was important to get the structure and the detail of the Conference settled and thus Conference arrangements and the selection of contributions for the Conference assumed centre stage for most of the time.

Conference arrangements
The group spent some considerable time discussing the general framework of the conference and the precise nature of the particular conference sessions. The programme took shape over the three days and became a very interactive programme. While there will be the normal keynotes and paper presentations there will also be many interactive sessions (creative exchanges, case studies, focused debates and provocative papers) which are designed to fuel working group discussion sessions. This interaction will culminate in a set of group presentations on the last day of the Conference.

Over the three days Hans prepared a detailed poster of the Conference proceedings - the following amplifies the content of that poster.

Sunday 21st.
From 14.00 onwards Registration will be open. At 16.00 the International Programme Committee will meet with the National Organising Committee and members of the Conference support team. The Conference Reception in the MENSA will begin at 18.00. The University Rector has agreed to speak at the beginning of the Reception.

Monday 22nd.

In the morning a Press Conference has been arranged. Sigrid (in liaison with the local National Organising Committee and the University Press Officer) will arrange that written materials for the Press are prepared well in advance. Sigrid, Deryn and Tom should be available to give short presentations and answer questions at the Press Conference.

Sigrid will chair the opening session and Deryn, Tom and the University Rector will speak - highlighting the role/importance of IFIP, reflecting on the last IFIP conference in Germany in 1983 and describing the work of the University of Dortmund.

Deryn will then chair the opening Short Keynote session. These keynotes will be provided by - the Minister of Education (suspect mention of virtual projects and virtual universities - 30 minutes), the President of the National Computer Science University (influence of Informatics on Education - 15 minutes) and the Dean of Computing Science (on 30 years of Computing Science - 15 minutes). Tom suggested short abstracts of these contributions should be prepared for participants - possibly for inclusion in the Conference Book.

Tuesday 23rd.

A "German View" option would run throughout the day - at times merging with the main sessions of the Conference. Sigrid explained that potentially 100 plus German colleagues would attend the German View, depending on holiday constraints. Presentations will be mainly in English - some in German - and the participants will gain certification from the University of Dortmund for attendance. Sigrid said that it would be valuable to have an interesting keynote lecture on that day devoted to e-learning - and that IBM had volunteered to provide a speaker. Volker agreed to contact IBM to confirm the speaker and his/her contribution to the Conference.

Tom stressed that the focus and content must fit the Conference and that there should be integration with the main thrust of the Conference at times during that day. Integration was achieved by scheduling the keynote presentation at the start of the day and by bringing all Conference attendees together for the immediate post-lunch session.

It is likely that the main exhibition of the Conference will take place on this day to maximise attendance and promote further integration.

In the evening the Conference Dinner (which thanks to sponsorship from the Dortmund Project will only cost 25 Euro) will be held in the DASA. This is a splendid museum with

traditional and modern environments and Sigrid promised a fantastic event! Tom suggested that there should be pictures and detailed information of the DASA and the event on the Conference website.

Wednesday 24th.

In the afternoon there will be an optional visit to Paderborn - to the Seimens Computer Museum. Again, thanks to sponsorship from Seimens, this will cost 50 Euro. Depending on the number of visitors small groups will be guided or suggested individual itineraries will be devised. It was proposed that Programme Committee members might, as appropriate, act as guides in the buses on the one hour journey to Paderborn.

Thursday 25th.

During this day another strand has been woven into the Conference framework. Members of small IT companies (possibly 20-30 participants) will explain the professional employment possibilities for IT specialists in different countries. There will be a vocational slant to the coverage of these sessions. Once again integration has been promoted through the scheduling of a German keynote speaker to start the day and a post-lunch interactive session.

Later in the day WG3.1 and WG3.2 will meet.

The day will conclude with a Free Concert provided by the University Orchestra - potentially a very pleasant social event. Again information will be posted on the Website.

Friday 26th.

This will include the presentation of the reports from the different discussion sessions. It will be followed by a closing session during which Sigrid will thank all attendees and flag up the next IFIP conference.

The Guided Tour of Dortmund will be hosted by English speaking guides and will follow lunch.

The interactive aspect of the Conference is very important. Raymond, Helene and Yvonne have agreed to work on the strategy for promoting this interaction. They will design a questionnaire that will be distributed to all participants on registration. The questionnaire will try to ascertain what participants are looking for in the Conference, which key areas/concepts they are unsure of - which they are experts in (and could even contribute expertise to discussion groups) - and a picture of issues the conference might

address/explore can be built up. Discussion groups will be formed and group chair-persons will monitor and support their groups throughout the week.

Paper Reviewing

As not all papers/contributions had been fully considered during the review process the Programme Committee had to carry out a number of detailed reviews. Some other proposals/papers had been recently offered for the conference. These were also assessed. The extended reviewing took some considerable time. The results of this extended review process were added to those reviews in Johannes's database. All contributions were then finally discussed and a complete list of accepted contributions prepared.

Of all contributions:
26 papers were accepted;
6 creative exchanges were approved;
7 case studies would be presented;
6 focused debate contributions were agreed;
6 provocative papers would be given.

Hans agreed to work with Johannes to provide the group with a summary list of accepted contributions and Johannes would send all copies of papers to Tom for editing purposes. Deryn agreed to contact all contributors to inform them (officially) of the results of the review process.

It was agreed, after much discussion, that a Conference Book would be given to all participants on registration and would include the detailed programme together with abstracts of all contributions - including short keynotes if possible. Tom and Bob agreed to edit (particularly to tidy up any language problems) and make the abstracts available for this book. All abstracts would have to be received by the end of April.

Kluwer will publish a Post-Conference Proceedings book - should this be financially viable. A minimum book order is 75 copies and Deryn explained how the sequence of development takes place and also explained the book agreement IFIP has with Kluwer. Tom and Bob have agreed to be editors of this book. It will contain the four keynotes and the twenty-six accepted papers.

Keynote Speakers

It was agreed that keynote speakers would not be approached until the IFIP contract for the Conference had been signed. Unfortunately it was not possible to engage keynote

speakers who would incur high costs e.g. with regard to attendance/flights. IBM, who is a key sponsor, had offered a keynote speaker on e-learning. Tom stressed that this must be a researcher/education expert and not simply a "product mover". Deryn proposed that all keynote speakers should focus on the issue of the digital divide.

The four suggested speakers were:
Monday - David Wood - looking at tensions in the digital divide;
Tuesday - IBM contributor - E-learning;
Thursday - Andreas Schill - Didactics of Information (with focus on the paradigm shift);
Friday - Jacques Berleur.

It was also proposed that an Unesco speaker might be asked to make a contribution. Deryn noted that all the keynotes were male and therefore it was decided that it might be important to invite a female speaker for the Sunday 21st. The Unesco speaker, Betty Collis and Diana Laurillard were all proposed. Deryn and Sigrid would progress this.

Papers
The papers fell, quite naturally, into the following categories:
1. Special schools/education - 1; 3
2. Co-operative learning 7; 23
3. Ethical aspects 16; 31; 33
4. Social aspects 28; 39; 44
5. Virtual communities 6; 14; 22
6. Pedagogical concepts 11; 13; 29
7. Curricula and teacher education 21; 27; 36
8. Object models (for informatics) 8; 26; 45; 48
9. Methods of informatics 17; 43; 49.

These were linked together to form the paper sessions at the conference:
Categories 3 and 7 on Monday 22nd.
Categories 1 and 2 on Tuesday 23rd.
Categories 4 and 6 on Thursday 25th.
Category 8 on Thursday 25th.
Categories 5 and 9 on Friday 26th.

Interactive Sessions
Most of the paper contributions from developing countries have been designated as contributions to interactive sessions. These contributions, together with some earlier

submitted focused debates ,provocative papers, case studies and creative exchanges should promote vigorous debate and stimulate a number of issues that the group discussion sessions will explore. The interplay of these two components of the Conference will be very important - and will require careful management to achieve the best results.

Conference Attendance and general matters

Sigrid explained that the break-even figure for the Conference is 77. Best estimates of likely attendance were put at between 100 to 130 participants. In addition there will be German teachers who will attend on the German View day at a reduced fee. Sigrid encouraged all members of the Programme Committee to register for the conference and pay the appropriate fee. They were also encouraged to contact colleagues (especially TC3, WG3.1, WG3.2) to do likewise. All contributors would be urged to register at the Early Bird rate. All local/national societies would be circulated with Conference details.

Sigrid explained that all rooms had been booked for the Conference and that there would always be twelve rooms available for different sessions in addition to the main lecture theatre. While lunch is not included in the Conference fee the on-site facilities are exceptionally good and very reasonably priced.

Publicity material was prepared for a Web-based flier which Programme Committee members were encouraged to distribute widely. The SECIII website would be updated to reflect the Conference Programme development that had taken place at this Committee meeting.

De : Sigrid Schubert <schubert@CS.UNI-DORTMUND.DE>
Répondre à : "Mailing list of IFIP WG 3.1" <IFIPWG31@listserv.cc.kuleuven.ac.be>
Société : Universität Dortmund, Didaktik der Informatik
À : <IFIPWG31@LISTSERV.CC.KULEUVEN.AC.BE>
Date : Mercredi, 3 avril 2002 19:26
Objet : Please support SECIII 2002!

Dear working group members

please remember our next Annual meeting in Dortmund in July 2002:

- I have booked 50 single rooms for the members of the PC and the members of the WG 3.1 at the "Tryp Hotel", former "Sol Inn Hotel", address: Emil-Figge-Straße 41, D-44227 Dortmund, phone: +49-231-97050, fax: +49-231-9705444. This hotel is within easy walking distance to the campus. When you contact the Dortmund tourist and information office, please quote the code word "Dortmund 2002 SEC III".

- With
http://seciii.cs.uni-dortmund.de/
you reach the new presentation of SECIII and
with
http://g2.www.dortmund.de/inhalt_externe/secdrei/form_secIII.htm
you reach the form of "Online-Registration".

Participants	71
Argentina	-
Australia	5
Austria	1
Belgium	-
Brazil	5
Canada	1
Chile	-
China	-
Denmark	-
Finland	-
France	1
Germany	38
Greece, Cyprus	1
Hungary	1
Iceland	-
India	-
Israel	1
Italy	-
Japan	-
Korea	-
Lithuania	1
Netherlands	4
Norway	-
Philippines	1
Poland	-
Portugal	-
South Africa	-
Spain	-
Sweden	-
Switzerland	5
United Kingdom	5

United States
of America 1

Best regards
Sigrid Schubert

Open IFIP-GI-Conference
"Social, ethical and cognitive issues of informatics and ICT - SECIII"
University of Dortmund, Germany, July 22-26, 2002
email: SECIII@cs.uni-dortmund.de http://seciii.cs.uni-dortmund.de/
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