



UNIVERSITÄT PADERBORN
Die Universität der Informationsgesellschaft

What Can We Gain from Transdisciplinary Visualization Courses?

Gitta Domik, University of Paderborn, DE

Dieter W. Fellner, TU Darmstadt/Fraunhofer IGD, DE

Alan Chalmers, Warwick University, UK

Holly Rushmeier, Yale University, US



What we want to gain from transdisciplinary education



Gerhard Fischer, Director of the Center for LifeLong Learning & Design, University of Colorado at Boulder, US:

“If the world of working and living relies on collaboration, creativity, definition and framing of complex problems – and if it requires dealing with uncertainty, change, and intelligence that is distributed across cultures, disciplines, and tools – then [university] programs should foster transdisciplinary competencies and mindsets that prepare students for having meaningful and productive lives in such a world.”



Why should WE do the work?



Visualization courses are multidisciplinary by nature

- **Vis problems**
 - **sciences**
 - **medicine**
 - **any data collection ...**
- **Vis content**
 - **computer graphics**
 - **perception**
 - **art (design, fine)**
 - **... Visual Analytics adds probability, AI, ...**



integrative learning

cross-disciplinary

multi-disciplinary

cross-curricular learning

inter-disciplinary

trans-disciplinary

Multidisciplinary / Interdisciplinary / Transdisciplinary

 Is there a difference?

Consistent definitions, in very short:



- **Multidisciplinarity:**
 - **separate/sequential**
- **Interdisciplinarity:**
 - **work jointly, but from different disciplines; blend knowledge**
- **Transdisciplinarity:**
 - **create new understanding from different disciplines**



Questions:



Dieter W. Fellner, TU Darmstadt & Fraunhofer Institute, DE

- **Graz/AT – Denver/US - Newfoundland/CA – Bonn/DE – Braunschweig, DE – Graz/AT – Darmstadt/DE**
- **200 full-time researchers**
- **300 studies, research projects and product prototype developments per year**



Questions:



Dieter W. Fellner, TU Darmstadt & Fraunhofer Institute, DE

“What benefits does an applied research institute expect from graduates that have experience in interdisciplinary or transdisciplinary collaboration?”

.... See file FellnerEG08.pdf



Questions:



Alan Chalmers, University of Warwick, Digital Laboratory, UK

- **Rhodes University/ZA – University of Bristol/UK
– University of Warwick/UK**
- **Warwick Digital Lab promises**
 - **collaborative research opportunities**
 - **effective knowledge transfer between disciplines, academia and industry**



Questions:



Alan Chalmers, University of Warwick, Warwick Digital Laboratory, UK

How will your teaching change in the new environment? Can your university overcome interdepartmental obstacles to teach interdisciplinary or transdisciplinary courses?

.... See file ChalmersEG08.pdf



Questions:



Holly Rushmeier, Yale University, US

- **Cornell University, US – industry – Georgia Tech – NIST – IBM – Yale University**
- **Chair of “Visualization Education for Non-Technical Majors” (IEEE Visualization 2006)**
- **Multidisciplinary initiative on “Computing and the Arts”**



Questions:



Holly Rushmeier, Yale University

- *Will there be interest from non-CS students to attend transdisciplinary visualization courses?*
- *What should be the balance between teaching disciplinary fundamentals and transdisciplinary education?*

.... See file RushmeierEG08.pdf



Questions:



Gitta Domik, University of Paderborn, DE

TU Graz/AT– industry/US – University of Colorado – University of Paderborn/DE

- **ACM Siggraph Education committee**
- **Visualization Education - www.upb.de/cs/vis**
- **Sabbatical at Center for LifeLong Learning & Design (L3D) - University of Colorado at Boulder: transdisciplinary education**



Questions:



Gitta Domik, University of Paderborn, DE

What do multidisciplinary, interdisciplinary and transdisciplinary education mean for an educator in practical terms? What methods and strategies can educators use, what obstacles need to be overcome?

.... See file DomikEG08.pdf