



UiO : **Department of Education**  
University of Oslo

# Teaser: **Beyond Disciplinarity**

## **‘Deep learning’**

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[uv.uio.no/iped/english](http://uv.uio.no/iped/english)

# Deep learning



- Preconditions for interdisciplinarity
- A key issue in new educational curricula and transformation of competences
- Competences needed for school students and early career researchers
  - Linked to 21st century challenges:
    - Digitalization; Changing labour markets; The role of science and knowledge creation in our societies

# Knowledge creation societies



”We educate young people for jobs that do not yet exist, to solve problems that have not yet occurred.

The projected top ten in demand jobs in 2010 did not exist in 2004.”

(Former US Secretary of Education Richard Riley)

- Breaking disciplinary constraints: Knowledge creation and innovation

# What is deep learning?

- **Complexity:** integrating disciplinary knowledge to solve real world problems.(Pellegrino & Hilton, 2012)
- Within disciplines (key concepts and principles)
- Interdisciplinarity (integrating knowledge domains)
- Transferable/Transversal competences





### Ways of Thinking

- Creativity and innovation
- Critical thinking, problem solving, decision making
- Learning to learn and meta cognition



### Ways of Working

- Communication
- Collaboration and teamwork



### Tools for Working

- Information literacy
- ICT literacy
- Learning to learn and meta cognition



### Living in the real world

- Citizenship, local and global
- Life and career
- Personal and social responsibility

← **Knowledge Skills Attitudes Values Ethics** →

# TRANSFERABLE SKILLS for Early-Career Researchers

## Research

- Citizen Science
- Data analysis
- Disciplinary knowledge/terminology
- Ethics/integrity
- Grant application writing
- Interdisciplinarity
- Literature use/management
- Open Access publishing
- Open Data management
- Open Education
- Open Evaluation
- Open Licensing
- Open Methodology
- Open Source
- Project/time management

## Career Development

- Career planning/assessment
- CV writing
- Interview techniques
- Job searching/application
- Skills documentation/verification
- Skills gap identification/development

## Digital

- Information accessing/retrieval
- Information presentation/visualisation
- Information processing/exchange
- Software usage/development
- Programming

## Communication

- Academic writing
- Formal correspondence
- Oral presentation
- Science for non-technical audiences
- Science for policy making
- Social media/webinar usage

## Cognitive

- Abstraction/creativity
- Analysis/synthesis
- Critical thinking/problem solving
- Organisation/optimisation

## Interpersonal

- Conflict management
- Discipline/perseverance
- Diversity awareness
- Leadership/team work
- Negotiation
- Independence/responsibility
- Networking
- Rhetoric/argumentation
- Stress tolerance
- Taking on responsibility

## Teaching & Supervision

- Course development/assessment
- Exam preparation/assessment
- Mentoring/supervising students
- Teaching and learning theories/methods

## Enterprise

- Commercialisation
- Entrepreneurship
- Innovation/knowledge transfer
- Intellectual Property Rights (IPR)
- Legal/business standardisation
- Patenting

## Mobility

- Intercultural awareness/communication
- Intersectoral awareness/experience
- Foreign language skills

# Deep Learning and Interdisciplinarity

- Student competences and future researchers
  - Transferable skills to enhance early-career researchers employability and competitiveness (Eurodoc, 2018)
- Building trust in science.
  - Understanding complexity
- Need for research on educational transformations and skills developments for interdisciplinary approaches.



**Thank you for your attention!**