# Perspectives from the educational sector

Cato Alexander Bjørkli

[cato.bjorkli@psykologi.uio.no]

Associate professor in Work and Organisational Psychology
Department of Psychology,
Faculty of Social Sciences

2022 05 03 @ HFC Stavanger

UNIVERSITY
OF OSLO

# What goes on inside the mind of students?

*Are they thinking about a career within Human Factors & Ergonomics?*

*Are educational institutions thinking about Human Factors & Ergonomics?*

UNIVERSITY OF OSLO

# Perspectives from the educational sector

## 1

What competence model may we use to guide students in their first steps?

## 2

What is the "*educational sector*" doing to bring students into the HFE discipline today?

## 3

An example from the PSY4404 course at the Department of Psychology @ UIO.

UNIVERSITY
OF OSLO

# UNIVERSITY OF OSLO

1

Competence model

# Definition by Human Factors and Ergonomics Society

Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.

Ergonomists contribute to the design and evaluation of tasks, jobs, products, environments and systems in order to make them compatible with the needs, abilities and limitations of people.

# Definition by Human Factors and Ergonomics Society

Ergonomics (or human factors) is the ==scientific discipline== concerned with the understanding of ==interactions== among humans and other ==elements of a system==, and the profession that applies ==theory==, ==principles==, ==data== and ==methods== to design in order ==to optimize== ==human well-being== and ==overall system performance==.

Ergonomists contribute to the ==design== and ==evaluation== of ==tasks==, ==jobs==, ==products==, ==environments== and systems in order to make them compatible with the ==needs==, ==abilities== and ==limitations of people==.

## ! TRANSDISCIPLINARITY !

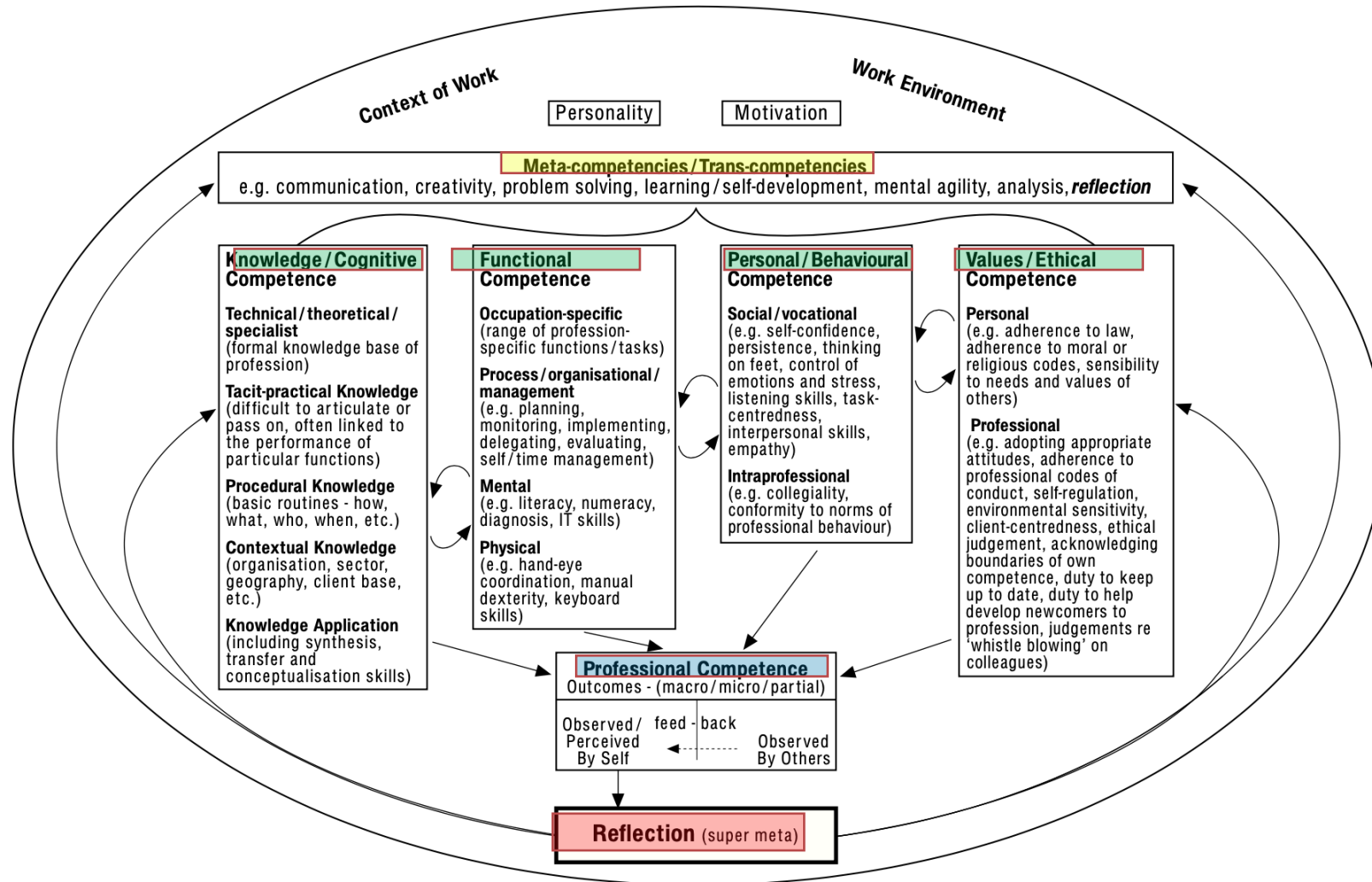# Board of Certification in Professional Ergonomics (BCPE)

*"*The following core competencies list the critical tasks necessary for an early career professional (…)*:*

**(… ) Systems approach & Analysis -** Consider the broader context of the human in the environment (…)

**(…) Design driven -** Analysis and assessment resulting in recommendations and actions for design (…)

**(…) Performance and well-being -** Efficiency and effectiveness and health and safety (…)

ANALYSIS (38%) – DESIGN (40%) – INTEGRATE (22%)

Cheetham, G., & Chivers, G. (1998). The reflective (and competent) practitioner: a model of professional competence which seeks to harmonise the reflective practitioner and competence-based approaches. Journal of European industrial training.

**META-COMPETENCIES**

Communication

Creativity

Problem solving

Self-development

**COMPETENCIES**

Knowledge

Functional

Personal

Ethical

**PROFESSIONAL COMPETENCE**

As perceived by self

As perceived by others

**REFLECTION**

Driving adaptability

Learning & Development

UNIVERSITY
OF OSLO

# UNIVERSITY OF OSLO

2

The educational sector and HFE

# Search: "Menneskelige faktorer" "Human factors"

**NTNU**

TS500813 - Menneskelige faktorer

TIØ4205 – HMS Metoder og verktøy i sikkerhetsstyring

IMT1003 - Innføring i IT-drift og informasjonssikkerhet

IMT3008 - Design av sikkerhetskritiske systemer

**UIO**

ITLED4230 – Ledelse av informasjonssikkerhet

PSY4404 – Human - Technology – Organization

IN2120 – Informasjonssikkerhet

**UIB**

MAPSYK303 Menneskelige faktorer i kritiske situasjoner

PSYK640 Operativ psykologi

PSYK117 Innføring i operativ psykologi

**UIT**

FLY6304 KURS i Anvendt Human factors

FLY3003 Anvendt human factors og luftfart

SM311 MTO (menneske, teknologi, organisasjon)

SIK-2010: Human Factors

**UIS**

E-MTOM100 - Human -Technology – Organization

Search: "Menneskelige faktorer" "Human factors"

**NTNU**

TS500813 - Menneskelige faktorer

TIØ4205 – HMS ... ... ...

IMT1003 - Innføring i IT-drift og informasjonssikkerhet

IMT3008 - Design av sikkerhetskritiske systemer

**UIO**

ITLED4230 – Ledelse av informasjonssikkerhet

PSY4404 – Human - Technology – Organization

IN2120 – Informasjonssikkerhet

**UIB**

MAPSYK303 Menneskelige faktorer i kritiske situasjoner

PSYK117 Innføring i operativ psykologi

**UIT**

... ... Human factors

FLY3003 Anvendt Human factors og luftfart

SM311 MTO (menneske, teknologi, organisasjon)

SIK-2010: Human Factors

**UIS**

E-MTOM100 - Human -Technology – Organization

# No leading generalist HFE program or full degree – but islands of enthusiasm

UNIVERSITY
OF OSLO

Page 11

(1) HFE is currently **not a clear and tangible path** for students.

(2) Higher education in Norway is **not responding** to industry needs

# UNIVERSITY OF OSLO
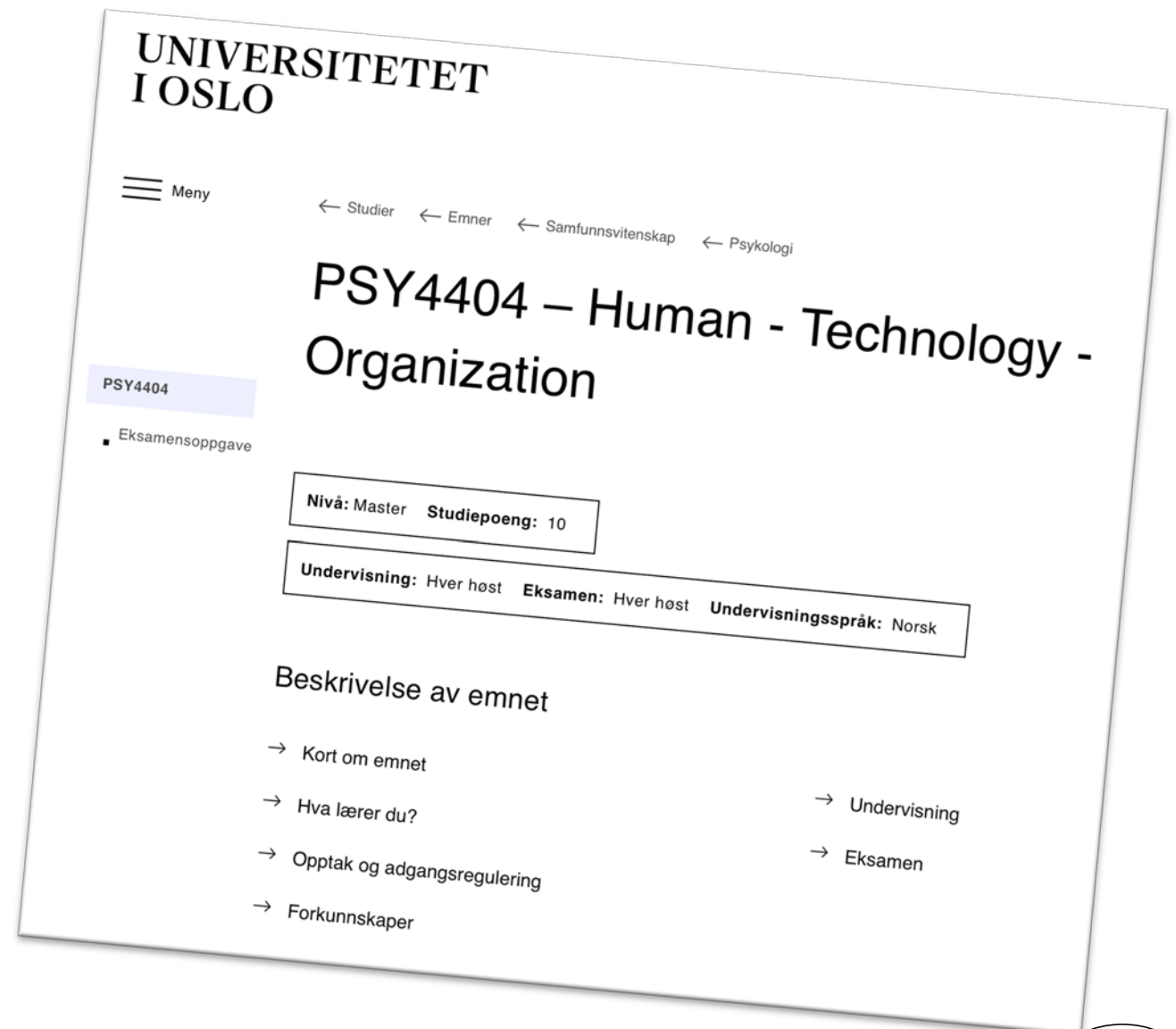
3

Example from UIO

psy4404

# UNIVERSITY OF OSLO

**PSY4404**

Fall sememster,

approx 20-25 students,

10 credits (=15 lectures +-)



UNIVERSITET I OSLO

Meny

← Studier   ← Emner   ← Samfunnsvitenskap   ← Psykologi

## PSY4404 – Human - Technology - Organization

PSY4404

. Eksamensoppgave

**Nivå:** Master   **Studiepoeng:** 10

**Undervisning:** Hver høst   **Eksamen:** Hver høst   **Undervisningsspråk:** Norsk

### Beskrivelse av emnet

→ Kort om emnet

→ Hva lærer du?

→ Opptak og adgangsregulering

→ Forkunnskaper

→ Undervisning

→ Eksamen

| TOPIC | THEME | Comment |
|---|---|---|
| **Introduction to HFE** | Basics, practice | HFE definition, history |
| **Levels of analysis** | Basics, model | Perspectives on systems vs individuals |
| **Cognitive Psychology** | Basics, model | Information processing model |
| **Workload – Error – SA – Decision Making** | Intermediate, theory | Concepts, meaures |
| **Automation** | Intermediate, theory/practice | Models + application |
| **Safety teams** | Intermediate, theory | Group perspective |
| **Safety organisations** | Intermediate, theory | Organisational concepts |
| **User-Centered Design – Universal Design** | Intermediate, method | Analysis, design, evaluation |
| **Case: EQUINOR – DNV - SINTEF** | Advanced/beginner | HFE at work |
| **Case: Chatbots – Sonification – Public Space** | Advanced/beginner | HFE challenges |
| | | |
| TASK ANALYSIS – RISK MODELS - USABILITY | - Critical flaw - | Currently missing!! |

# Zhang et al (2021) Student Perspectives on Changing Requirements for Human Factors Engineering Education

Survey from 25 North American Universities, sample N=62,

"In your opinion, what aspects of HFE education need improvements?"

1. Inclusion of AI/ML/data science

2. Up-to-date case study examples

3. Interdisciplinary projects related to data science

4. Practical experience

Zhang, B. Y., Rantanen, E. M., & Chignell, M. (2021, September). Student Perspectives on Changing Requirements for Human Factors Engineering Education. In Proceedings of the Human Factors and Ergonomics Society Annual Meeting (Vol. 65, No. 1, pp. 1579-1583). Sage CA: Los Angeles, CA: SAGE Publications.

UNIVERSITY
OF OSLO

# UNIVERSITY OF OSLO

Thank you for your attention!

# UNIVERSITY OF OSLO

# Perspectives from the educational sector

Cato Alexander Bjørkli

cato.bjorkli@psykologi.uio.no

Associate professor in Work and Organisational Psychology

Department of Psychology,
Faculty of Social Sciences

2022 05 03 @ HFC Stavanger