The Bicycle as Teaching Object for the Training of technical and soft Skills in University Education.
A Practitioner's Report from the interdisciplinary Teaching Project kompass at Mannheim University of Applied Sciences

International Cycling Conference 2017
Mannheim, 19-21 September 2017
Mannheim University of Applied Sciences: Profile

Facts & Figures
- 5,221 students (33.3% female, 13.2% international)
- 181 professors, 173 academic staff members
- 9 departments
- 23 Bachelor programs
- 10 Master programs

Mission Statement
For more than 100 years, Mannheim University of Applied Sciences has been anticipating future educational demands. We can look back on a dynamic tradition and commitment to meeting future challenges with innovative educational concepts.
Project kompass: Discover Interdisciplinarity

Objectives
- Fostering interdisciplinary teamwork
- Promoting benefits of heterogeneity and diversity
- Strengthen efficacy and interpersonal trust
- Establishing a shared identity on campus

Measures
- Team matching according to diversity criteria
- Open assignments
- Enabling students to design and implement concepts: peer coaching, scientific assistance, professional partners, infrastructure
- Presentation at public event, expert jury rewards sustainable, innovative and creative concepts
Bicycle as Teaching Object

- Introduction to large-scale societal challenges like mobility, sustainability, health, and security
- Combining approaches, methods, and knowledge from different academic disciplines: technical engineering, economics, social sciences and design
- Integral Part of students’ lifeworld
- Early prototyping: low-tech procedures, virtual-reality-modelling, or high-end construction techniques
- Communication Starter, contact to small local business, easy accessible experts
Student Project "Hearing Bike"

Concept
- Facilitating bike rides for people with hearing impairments
- Acoustic signals captured by sound recognition software, translated into vibrations of handle bars

Practice of Technical Skills
- Expert interviews with target groups
- Identification of use cases
- Sound pattern analysis
- Micro processor programming
- Soldering of vibrators
Student Project "Emergency Bike"

**Concept**
- Light and manoeuvrable vehicle for first responders with capacity to carry emergency equipment
- Quick access in rough terrain to people in need of medical assistance

**Practice of Technical Skills**
- Expert interviews with Red Cross
- Connection of LEDs and siren
- Energy supply
- Micro processor programming
- Virtual Engineering
Training of Soft Skills

- Shared understanding of the problem
- Getting to know different disciplinary approaches
- Developing academic identity
- Defining goals, setting benchmarks
- Communication competences, presentation skills
- Group dynamics
Measuring Skills (Summer Term 2017)

Self assessments of relevant aspects of personality, efficacy, motivation, interpersonal trust, and commitment to study programme and Mannheim University of Applied Sciences

Method

- web survey conducted in two waves: Beginning of programme (entry) and last week of programme (exit)
- both questionnaires comprising identical items
- construct validity of measures statistically tested
- Analysis by comparison of means (entry v. exit)

Caution!

Effects may not be attributed monocausally to participation in the programme!
Findings & Discussion

- **Entry Survey**: high levels of confidence and motivation
- **Exit Survey**: slightly lower ratings on positive personality aspects
- But: „Harmonizing effect“ of distribution on all dimensions

- **Entry Survey**: great belief in ability to handle problems alone
- **Exit Survey**: increased belief in dependence on others
- But: Stronger social trust

- Indication of growing recognition of the importance of teamwork?
Participants’ Feedback (Summer Term 2017)

"At the beginning, I would have never expected to be able to get such a project up and running with a bunch of people that didn’t know each other.

I was really stunned to realize how easy it can be to get something done if only you can rely on a great team!

"I’m a student of Social Work. kompass was beneficial because I could apply my skills in project management and teamwork practically.

"I entered kompass with pretty low expectations. Now I am positively surprised, how valuable this experience has been for me personally. Even if the project was quite exhausting at times.

"The insights into other fields of study have been very interesting and I enjoyed meeting new people. You rarely get the chance to do so. Taking part in kompass has certainly improved my openness to social interactions."
Thank you for your attention.

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