

Material Efficiency in Higher Education

Requirements Regarding Teaching and their
Practical Realization in a New Simulation Game

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Who we are ...

HOCHSCHULE PFORZHEIM UNIVERSITY 

• IAF •

Institute for Applied Research



Research and
method development

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Steinbeis-Transferzentrum für Marketing,
Logistik und Unternehmensführung



Consulting of SME

Faller

hansgrohe
AKOR | INAKO

Koehler

LOFO
HIGH TECH FILM

Zietkier
EM-ANALYSE-SES
KONSTRUKTIONSTECHNIK

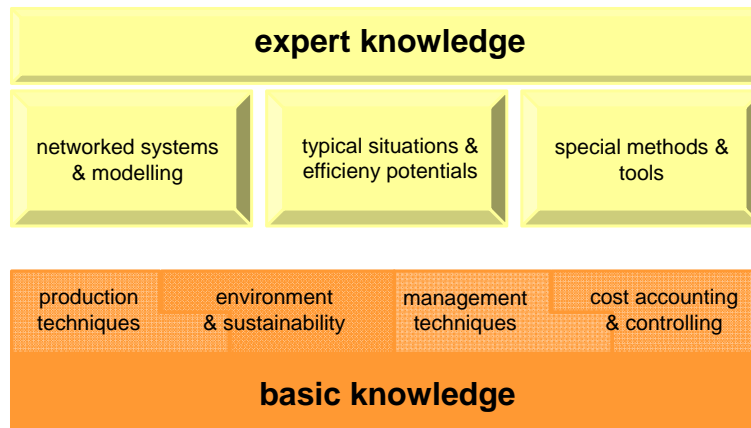
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Teaching

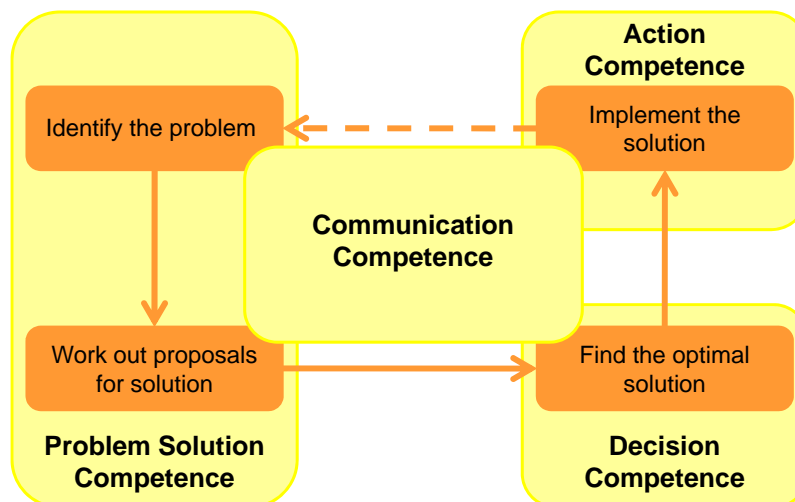
How can we transfer our knowledge and our experiences to the teaching?

How to teach material efficiency: Hard Skills



➔ Can be trained by lectures!

How to teach material efficiency: Soft Skills



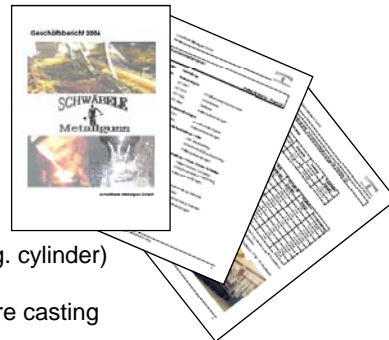
➔ Requires active teaching forms!

Introducing the game: key data, characteristics and aim

- ▶ Target group: (currently) students of economics and/or engineering
- ▶ Duration: one semester with seven half-day events or one week as a block event
- ▶ Language: currently only German
- ▶ Result-open simulation game organized as a project
- ▶ Unknown parameters (unlike conventional simulation games)
- ▶ Paper-based with free choice of applied tools and methods
- ▶ Complex material flow model in background for simulation of activities
- ▶ Aim: optimization of a production site under the view of the material flow management

Introducing the game: The virtual enterprise

- ▶ Middle-sized automobile supplier from Southern Germany
- ▶ Traditional family business with a strong hierarchical organization
- ▶ Parent plant in Germany with sales offices in Detroit/Michigan (USA) and China
- ▶ 780 employees at the parent plant
- ▶ Products:
 - ▷ Engine blocks from iron sand casting
 - ▷ Parts from aluminium pressure casting (e.g. cylinder)
 - ▷ Nickel-plated parts from aluminium pressure casting



Introducing the game: Roles & conflict of goals

- ▶ Especially for training of communication competence and decision competence
- ▶ Roles represent different perceptions in the enterprise supported by shared and role-specific data
- ▶ Conflict of roles through conflict of goals → role-specific and contrary key figures which must be optimized



CEO



Production



Controlling



Materials
administration



Environment
protection

Introducing the game: Practical Appliace

Played with students from:

- ▶ Purchasing and Logistics (Pforzheim University)
- ▶ Sustainable Management (University of Lüneburg)



Experiences after the practical tests

- ▶ Very deep comprehension of material flow management, technical processes and analysis methods at the end of the simulation game
- ▶ High engagement of the students during the play rounds
- ▶ Almost all implemented inefficiencies identified + inefficiencies which were not originally intended



The simulation game is suitable in a high extent to transfer the expert knowledge as well as the application of material flow management also in not technology-oriented study paths.

Thank you
for your attention!

<http://umwelt.hs-pforzheim.de/en/teaching/planspiel/>