

# **Berlin/Beuth University of Applied Sciences and Technology**

16/06/2022

**Prof. Dr. Florian Schindler**

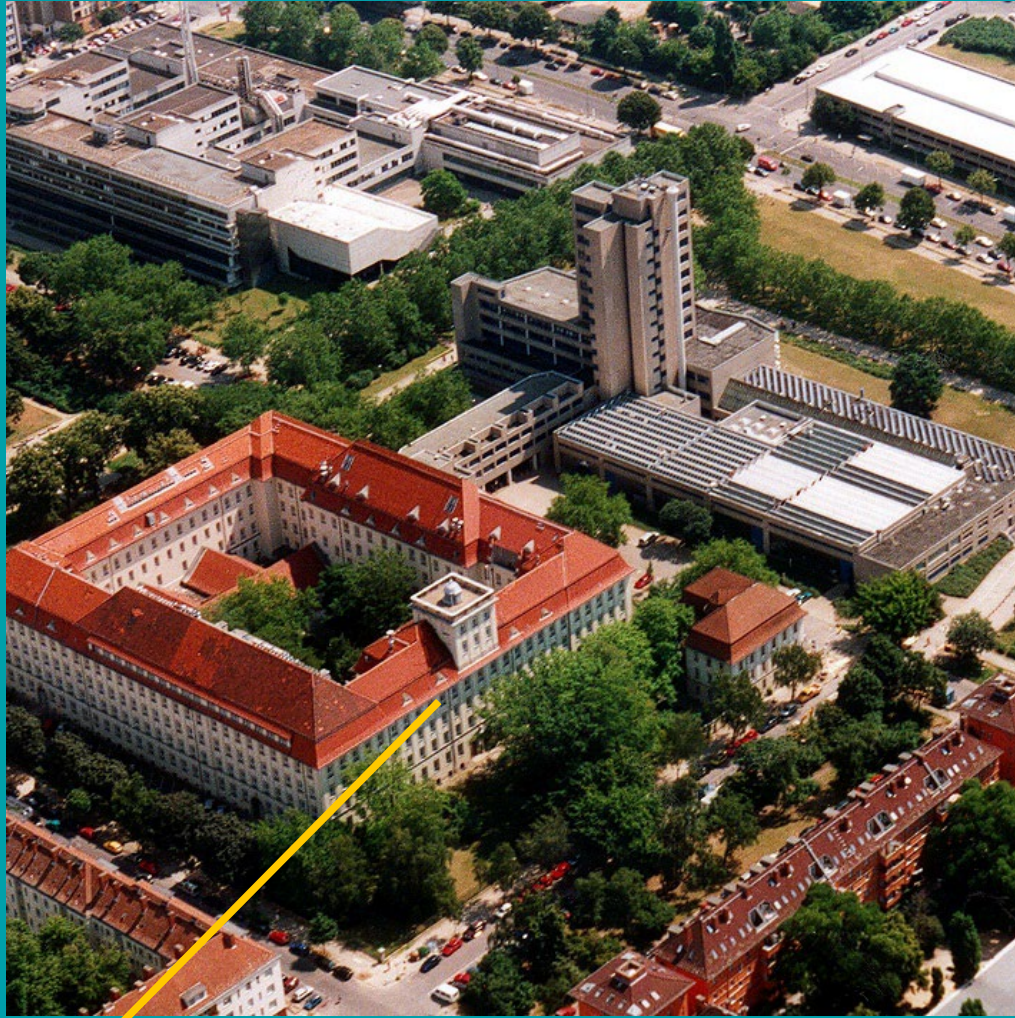


# Our University

**Berliner Hochschule für Technik**  
Studiere Zukunft



**From above**



**BHT**

Berliner Hochschule  
für Technik

Studiere Zukunft

# Berlin University of Applied Sciences and Technology

- Founded in 1971 as Technische Fachhochschule Berlin, renamed Berlin University of Applied Sciences and Technology in 2021

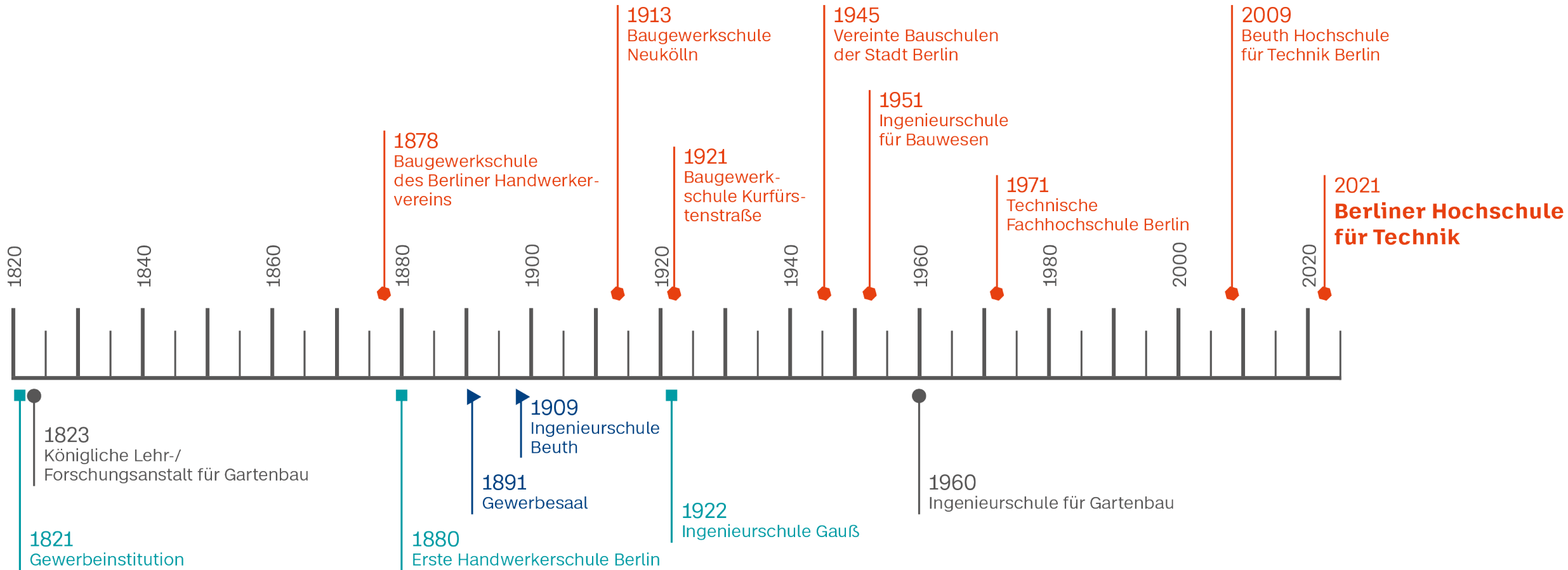


- Over 13,000 students in 72 degree programmes
- Largest range of engineering degree programmes in Berlin-Brandenburg





# University of Applied Science and Technology - Development -



# Central Berlin Campus

Building:

A – Beuth

B – Gauß

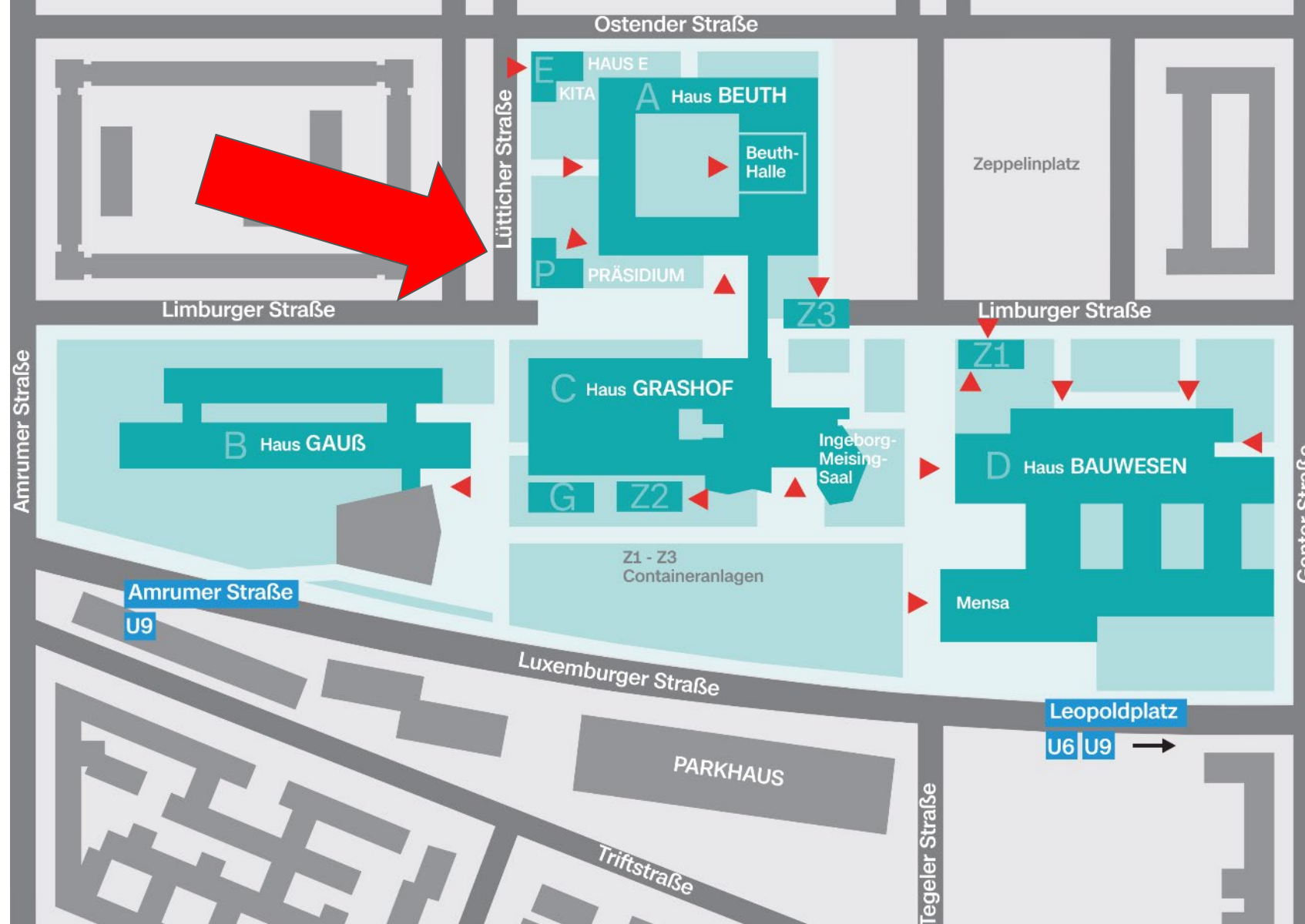
C – Grashof

D – Bauwesen

E – Kindergarten

G – Greenhouse

P – Präsidial „Palace“





**BHT**

Berliner Hochschule  
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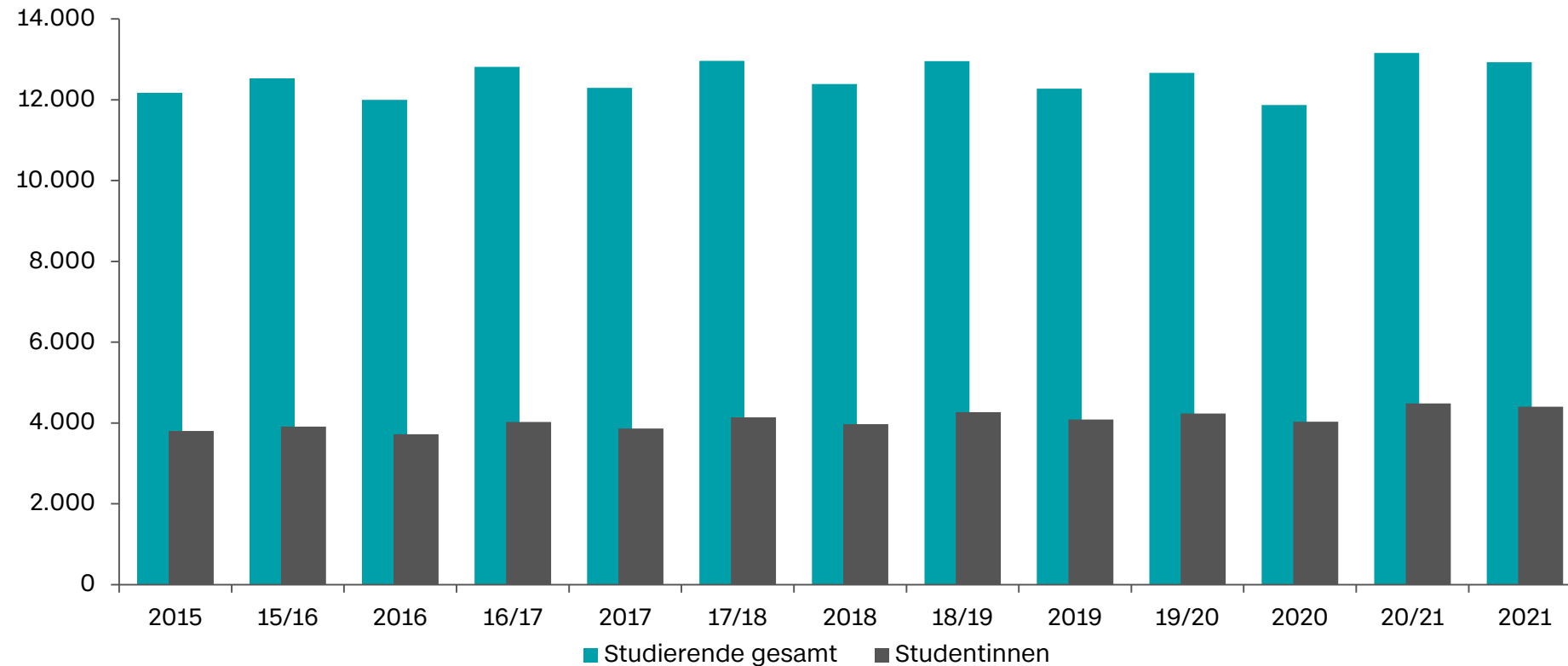


House „Beuth“

**Our University**

# Number of Students enrolled

**About 13.000 (12.929) Students as of 2021**

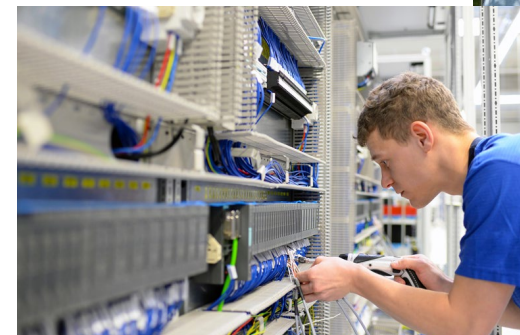
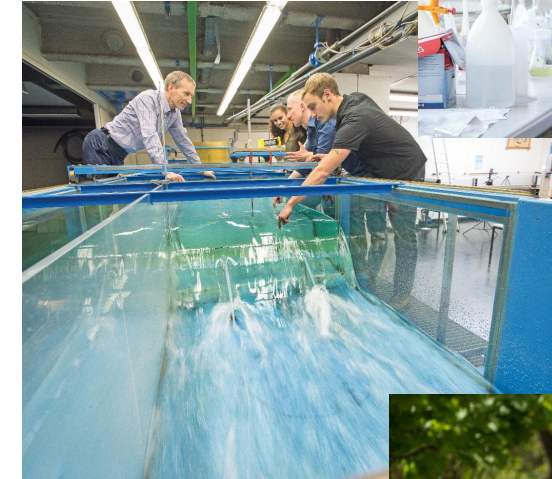




# Our Study Programmes

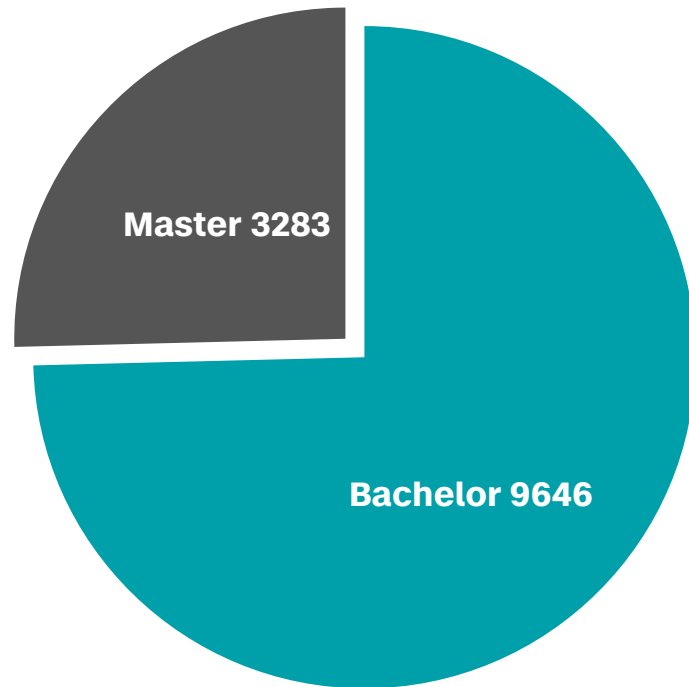
Our more than 70 Bachelor's and Master's degree programmes are accredited.

- Engineering and Natural Sciences
- Building and Housing
- Communication and Media
- Business
- Environment
- Health
- Further education / Dual Programmes



# Facts and Figures

## Students



## Departments

- |                  |  |
|------------------|--|
| I                | Economics and Social Sciences  |
| II               | Mathematics, Physics, Chemistry  |
| III              | Surveying, Cartography, Civil Engineering  |
| IV               | Architecture, Facility Management  |
| V                | Biotechnology, Food Techn., Horticulture, Packaging Techn., Landscape Architecture |
| VI               | Computer Science, Print + Media Techn., Media Science                              |
| VII              | Electrical Eng., Mechatronics, Optometry   |
| VIII             | Mechanical Eng., Chemical Eng., Theatre Techn., Audiovisual Media                  |
| IX $\frac{3}{4}$ | Institute of Distance Learning   |



# Competence Centres „City of the Future“

## Life in the city of the future

Education

Economy

Health

Social Sciences

## Infrastructure

For the city of the future

Mobility

Communication

Media

Leisure Time

## Urban Technologies in the city of the future

Energy and Resource efficiency

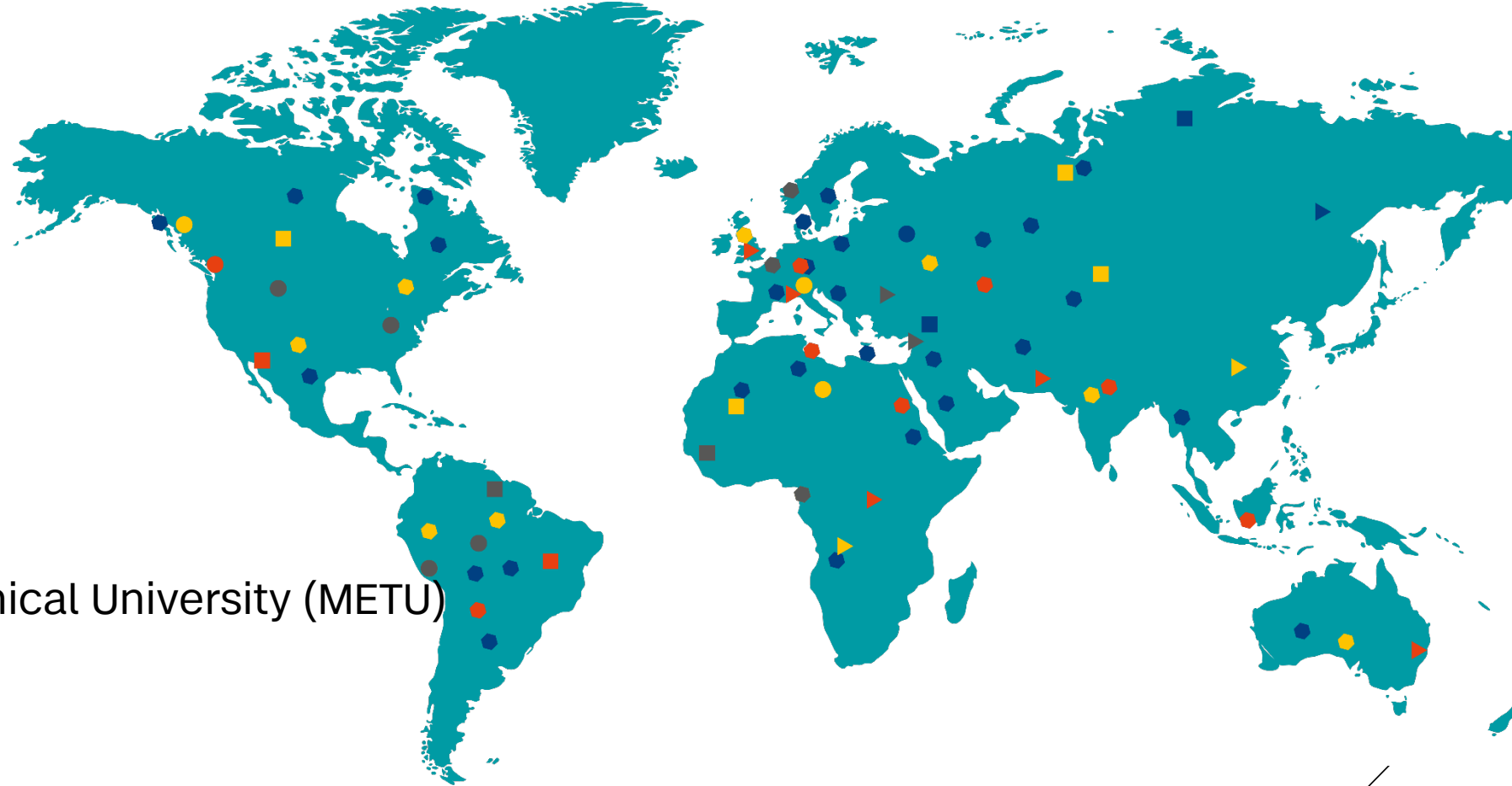
Renewable Energies

Green Buildings

# International Cooperations

with

- New Jersey, USA
- Rio de Janeiro, Brasilien
- Adelaide, Australien
- Strasbourg, Frankreich
- Beijing, China
- Jerusalem, Israel
- Bischkek, Kirgisistan
- Cartago, Costa Rica
- Ankara, Middle East Technical University (METU)

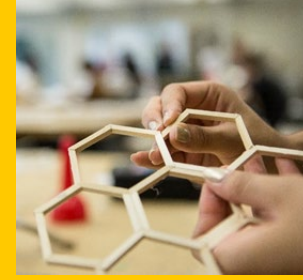




# Institute of Distance Learning



- ◆ 6 Distance master courses
- ◆ Distance Learning and Online Courses
- ◆ International Projects
- ◆ Professional Education
- ◆ Dual Study Programmes
- ◆ Training of Trainers





**BHT**

## **Institute of Distance Learning**

Berlin University of Applied Sciences  
and Technology

# Institute of Distance Learning



## **Postgraduate education with Blended Learning:**

- Full Master Degree Programs
- Term Courses
- Single Modules

## **Further education with Blended Learning :**

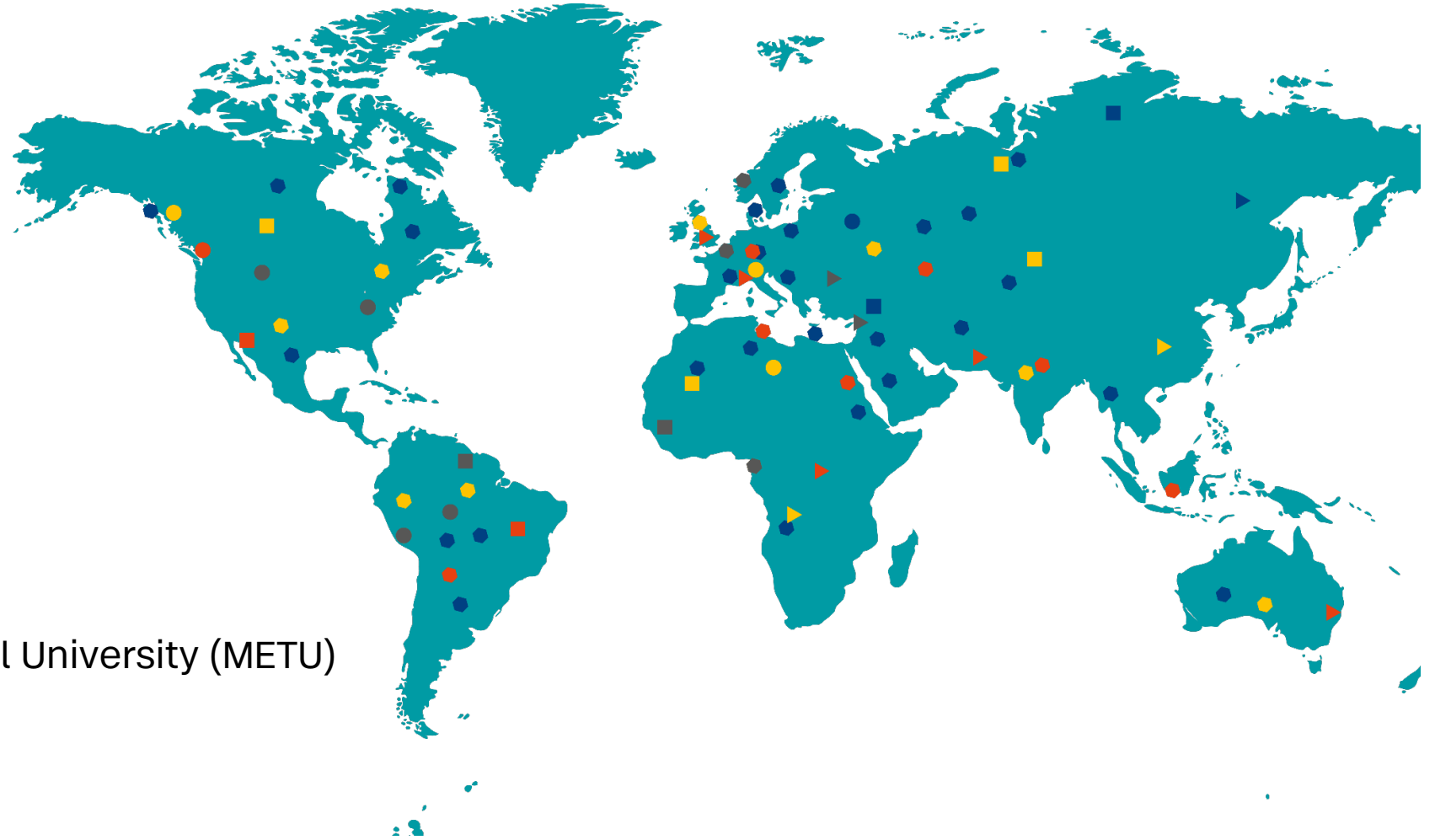
- International Summer Schools
- On-the-job Trainings for Companies
- University HR Trainings



# International Cooperation

with

- New Jersey, USA
- Rio de Janeiro, Brasilien
- Adelaide, Australien
- Strasbourg, Frankreich
- Beijing, China
- Jerusalem, Israel
- Bischkek, Kirgisistan
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# **Blended Learning Part I**

# Blended Learning



## PART I

- **Preparation**
- **Set-up**
- **Learning Environment**
- **Tools**
- **Reflection**

## PART II

- **The Blend**



# PREPARATION

## Assessment



Analyze the training needs:

- Content
- Scope
- Future perspective

## Resources



Check the training resources:

Human resources, time, money, existing material and experiences, training sites, etc.

## Target group

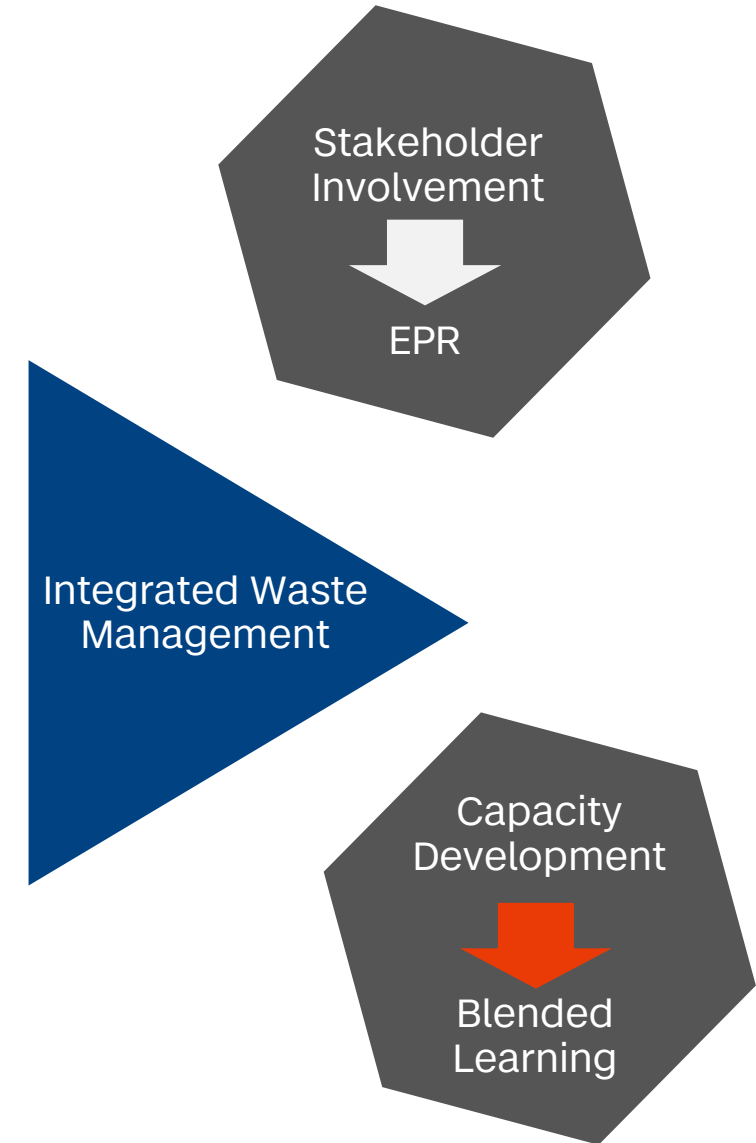


Define the target group:

- Number of participants
- Pre-education for the subject
- Learning Outcome!

# SET-UP

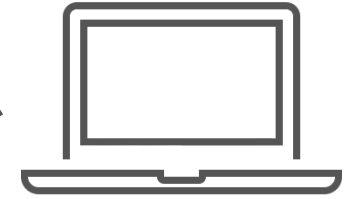
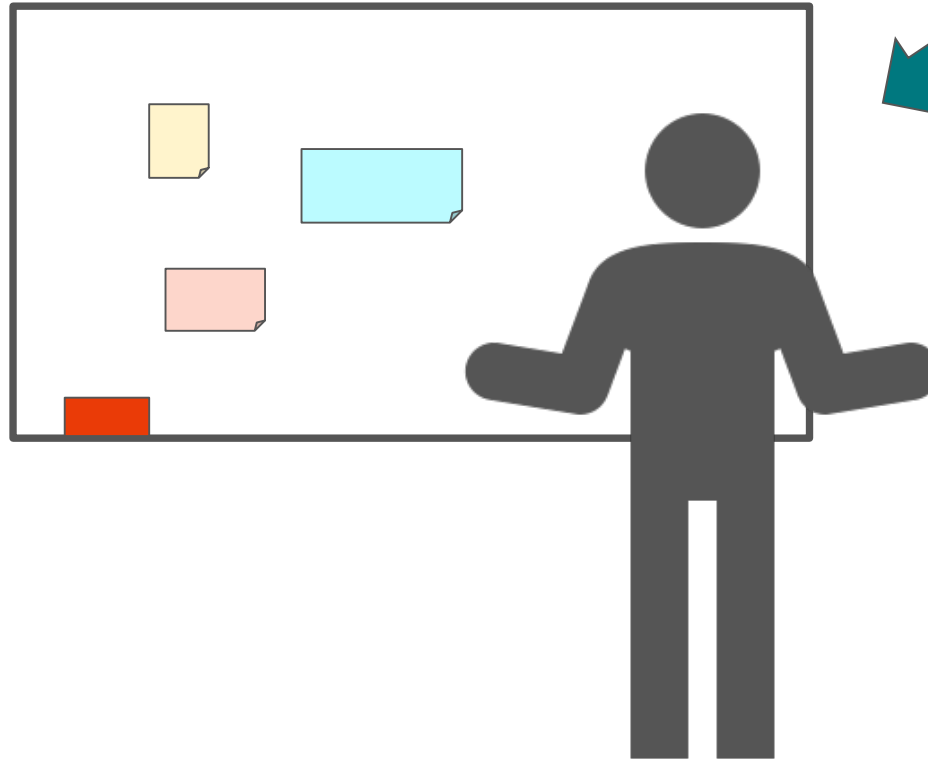
- **Organizer**
- **Trainers**
- **Language**
- **Duration (Intervals)**
- **Completion with certificate**
- **Assignments / home work**
- **Interaction / discussion**
- **Accompanying material**



# LEARNING ENVIRONMENT

## Face-to-Face learning

1. Workshop
2. On-the job training
3. Classroom / Course
4. Agile learning



Digital support  
for trainers and  
participants



# LEARNING ENVIRONMENT

## 1. Workshop

Face-to face only

Online format only



**MM92 TOTAL PRODUCT COSTS**

Methodology

- First step: the table below shows the total product costs of Repower for all business segments. All values are extracted from the „annual report FY 2010/2011“ – see reference 2.
- Second step: the total costs of onshore products are calculated as 74% of total costs
- Third step: the total costs of MM92 WT family are calculated as 56% of onshore total costs

Cost type	Total costs	Total onshore	Total MM92 costs mEUR
Costs of material	950.00	705.71	393.23
Personnel costs	118.40	87.95	49.01
Equipment depreciation / Repair	21.28	15.81	8.81
Other OPEX	128.48	95.44	53.18
Financing expenses	4.70	3.49	1.95
<b>TOTAL</b>	<b>1,227.08</b>	<b>911.54</b>	<b>506.18</b>

Hybrid format



Workshop-photos: Maryam Sepher, giz GmbH

# LEARNING ENVIRONMENT

## 2. On-the-job training

Practical exercises



Lab work



Field trip

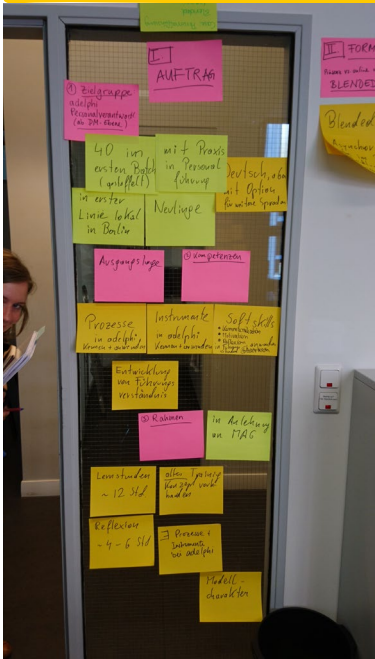


# LEARNING ENVIRONMENT

## 3. Classroom / Courses

Semester (study program, years)

Seminar (1-3 days)



Videopodcast der Einführungsveranstaltung zum Modul „Dynamik / Schwingungen technischer Systeme“  
Dozent: Prof. Dr.-Ing. Schlenzka  
Fachbereich Maschinenbau, Verfahrens- und Umwelttechnik der Beuth Hochschule für Technik Berlin

Übersicht:				
01 Aufstellen der BDGL				
02 Parameter der DGL				
03 Beispielaufgabe Pendel (Drehschwingsystem)				
04 Das Masseträgheitsmoment	1	2	3	4
05 Die Dämpfung				
06 Beispielaufgabe zur Dämpfung	Aufstellen der BDGL	Parameter der DGL	Beispielaufgabe Pendel (Drehschwingsystem)	Das Masseträgheitsmoment
07 Aperiodischer Grenzfall				
08 Lösungsansatz BDGL				
09 Starke Dämpfung ( $\zeta > 1$ )				
10 Fortführung Beispiel Pendel				
11 Verfahren der komplexen Ergänzung	5	6	7	8
12 Fortsetzung komplexe Ergänzung				
13 Beispiel Einsendeaufgabe	Die Dämpfung	Beispielaufgabe zur Dämpfung	Aperiodischer Grenzfall	Lösungsansatz BDGL
14 Anmerkungen Fouriertransformationen				

Module (1 – 3 months)



Summer School (3 weeks)

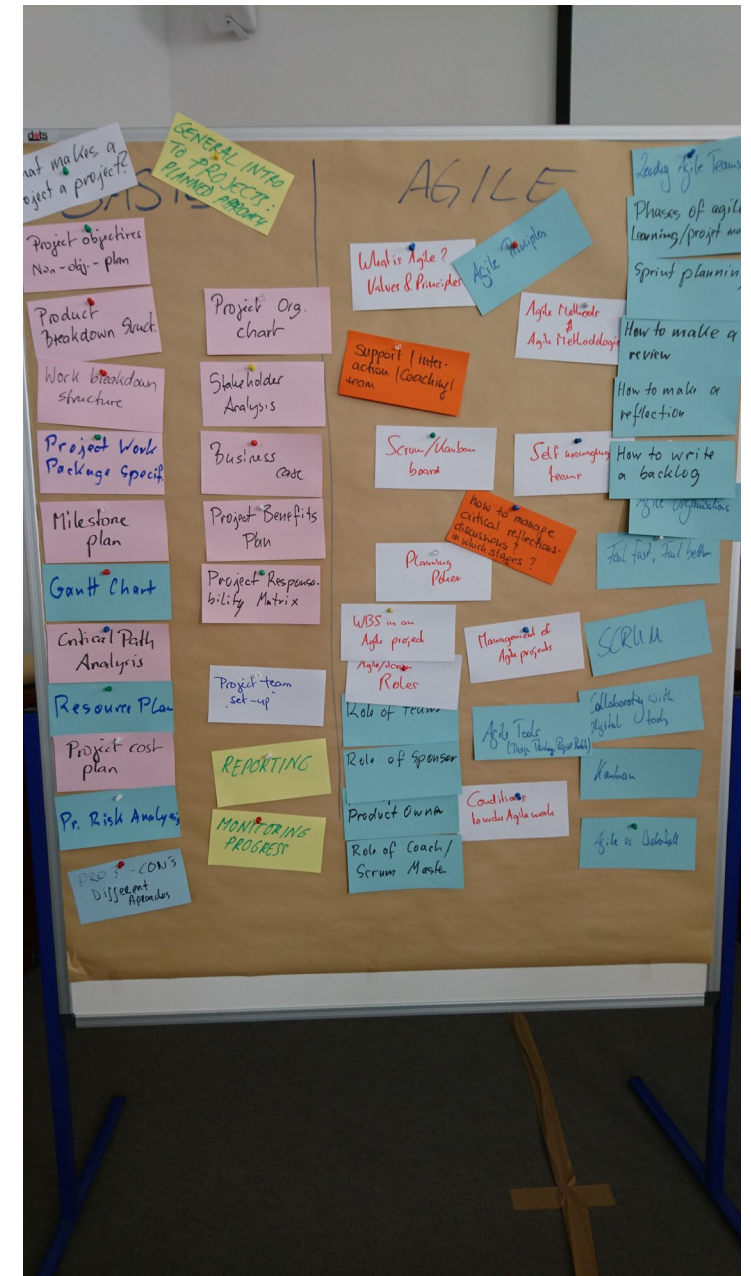


# LEARNING ENVIRONMENT

## 4. Agile Learning

Learning goes **AGILE**

- **A**lternating phases of learning and adopting (Learn-Test-Adjust)
- **G**enerating personalized, work-related learning goals
- **I**terative sprints for adaption to changing conditions
- **L**earning in a self-directed manner
- **E**ngaging in a community of practice



# Agile Learning Projects

## Kick-Off

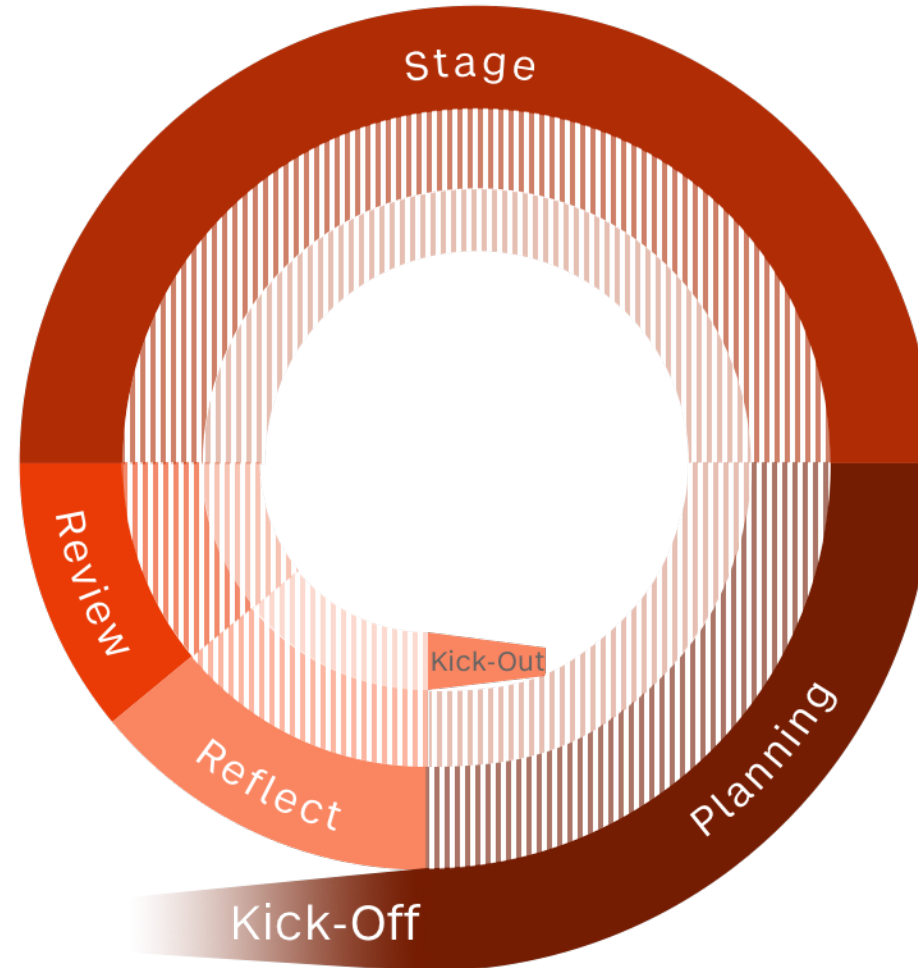
- Contracting & scope
- Familiarize with agile methods

## Planning

- Plan a new stage (2-4 weeks)
- Get needed resources (experts, e-learning, etc.)

## Stage

- Work on practical tasks
- Get on-demand support



## Review

- Review quality of solutions
- Get professional feedback

## Reflect

- Reflect learning strategies
- Monitor competence development

## Kick-Out

- Measure development
- Assign new responsibilities

# Learning Methods

## Learning Outcome based:

- ✓ Workshop
- ✓ Classroom / courses

## Learning Problem Based:

- ✓ On-the-job training
- ✓ Agile learning



Photo: Nareeta Martin, Unsplash

# TOOLS



## LMS

Online platform like Moodle or shared space like MS Teams for communication. Up- and download of information material and document sharing.



## Webmeetings

Live sessions with international experts, lecturers and guests as video, audio or chat only as well as video and audio recordings of live meetings.



## Microlearning

Small sequences of just-in time learning while working on the job .



## Tutorials

Video tutorials for lecturers and students to familiarize with the different functionalities and use cases of the available tools.



# TOOLS



## LMS

Online platform like Moodle or shared space like MS Teams for communication. Up- and download of information material and document sharing.

The screenshot shows a Moodle course page for 'Energy Efficiency in Buildings'. The main content area features a large green box with the text 'ENERGY EFFICIENCY IN BUILDINGS' and an illustration of a city with green buildings. The left sidebar contains a navigation menu with 'Home', 'Participants', 'Grades', and 'Modules 1-3'. The right sidebar shows 'Activities', 'Search forums', 'Latest announcements', 'Upcoming events', and 'Recent activity'.

This screenshot shows a course unit page for 'Hydro Power' with the title 'Example Course Units'. It includes a table of contents with items like '2 Resource Assessment', '3.1 Head Measurement', and '3.2 Flow Rate Measurement'. A photograph shows two students in a field using surveying equipment to measure a stream.

This screenshot shows another course unit page for 'Hydro Power' titled '3.2 Intakes and Trash Racks'. It contains text explaining trash racks and includes a photograph of a trash rack installed in a stream.

This screenshot shows a course unit page for 'Wind' titled '3.4 Needs'. It includes a diagram of a wind turbine with numbered parts: 1. Nacelle, 2. Generator, 3. Pitch system, 4. Pitch drive, 5. Pitch motor, 6. Pitch controller, 7. Pitch bearing, 8. Pitch seal, 9. Pitch cable, 10. Pitch rope, 11. Pitch roller, 12. Pitch guide, 13. Pitch stop, 14. Pitch limit switch, 15. Pitch limit switch, 16. Pitch limit switch, 17. Pitch limit switch, 18. Pitch limit switch, 19. Pitch limit switch, 20. Pitch limit switch.

This screenshot shows a course unit page for 'Bioenergy' titled 'Exercises'. It contains two multiple-choice questions about biomass and bioenergy conversion processes.

# TOOLS

## Self Learning Material

Didactically tailor-made self-study material with a clear structure:

- Clearly defined learning units with a clear scope
- Each learning units starts with the Learning Outcomes and ends with a summary
- The content is motivating, practical and understandable (different from textbooks)

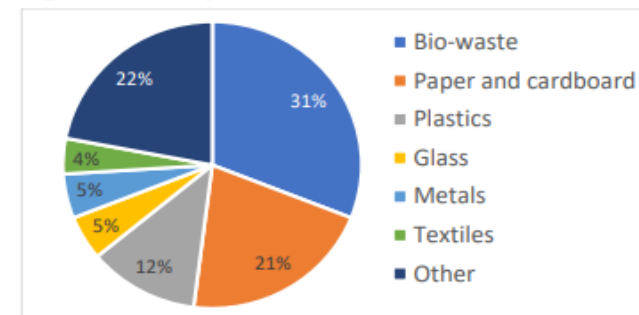


# TOOLS

## Resources

These resources can be used for different learning types:

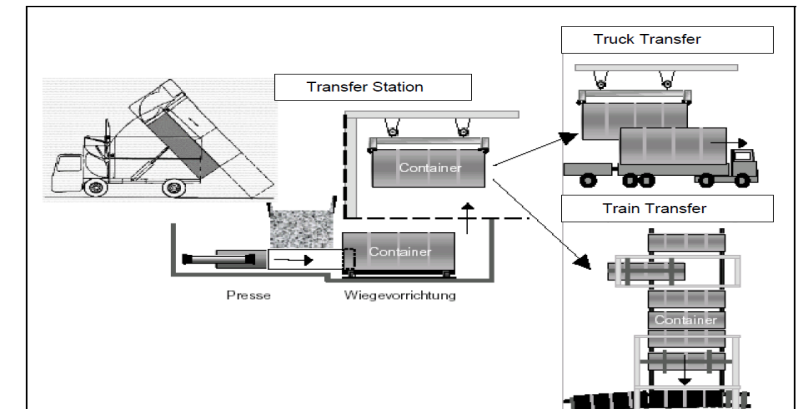
- PowerPoint
- Spoken PowerPoint
- Checklists
- Flowcharts
- Videos
- Photos
- Infographics



Source: based on Worldbank (2018) and Eurostat (2008)<sup>5</sup>

### Economic and Infrastructure Features

<input type="checkbox"/>	<b>Economic viability of management and site concept</b> Revenue generation of park management
<input type="checkbox"/>	<b>Fiscal effects on the municipality</b> Direct and indirect costs and revenues, job creation
<input type="checkbox"/>	<b>Infrastructure provision</b> Roads, bicycle and pedestrian infrastructure, access points, water network, sewage system, common effluent treatment plant, telecommunication
<input type="checkbox"/>	<b>Energy generation and distribution</b> Integrated energy concept comprising electricity grid, gas and steam distribution network, energy efficiency measures and integration of renewable energies
<input type="checkbox"/>	<b>Waste management</b> Waste prevention, handling, treatment, recycling and disposal
<input type="checkbox"/>	<b>Water and wastewater management</b> Drinking and process water supply, rain water harvesting, wastewater prevention, treatment, reuse and disposal
<input type="checkbox"/>	<b>Eco-efficient transport system</b> Provision of car sharing options, electric vehicles, compressed natural gas buses



Ref: Prof. Dr. Schindler F., Söling, Frieder, Prof. Dr.-Ing. Joachim Weiland, (2010/12) Waste management/recycling techniques, Institute of Distance Learning Berlin

# REFLECTION

Participants: self-evaluation of learning experience

Organizer:

- ✓ Feedback from participants
- ✓ Evaluation

**Methods for the exchange of experiences:**



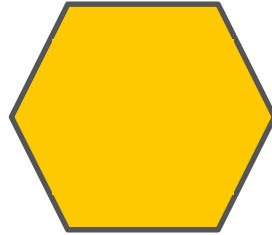
# REFLECTION

methods	Reflection	expression		Visual	Experience	Subject	Comments	Time of experience
		Written	Verbal					
After action review	X	X	X			Learning from positive and negative experiences	Interview, lessons learned, micro article, best practice	P O M R
Best and good practice	X	X	X			Identify best (good) practices, present and communicate, benefit	As well: lessons learned, micro article	P M O R
Lessons learned	X	X	X			Positive and negative experiences, monitoring, reflection, presentation – used as internal method		P O M R
Reunion / Debriefing	X	X	X			Workshop or meeting after action (quick, effective, cheap), group reflection, collection of ideas for improvement	As well: lessons learned	P M
Communities of Practice		X	X		X	Formal and informal networks for exchange (need confidence and reciprocity)	As well: experts network	R P O M
Experts Networks		X				Exchange of experiences (local, national, international)	As well: best practice	R
Micro Article	X	X				Documentation of an individual experience (verbal, written, audio, blog)	As well: story telling	P O M
P = Knowledge of Process						O = Knowledge of Objectives		
M = Knowledge of Proceedings						R = Knowledge of Relations		
C = Knowledge of Competences								



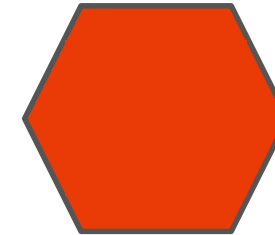
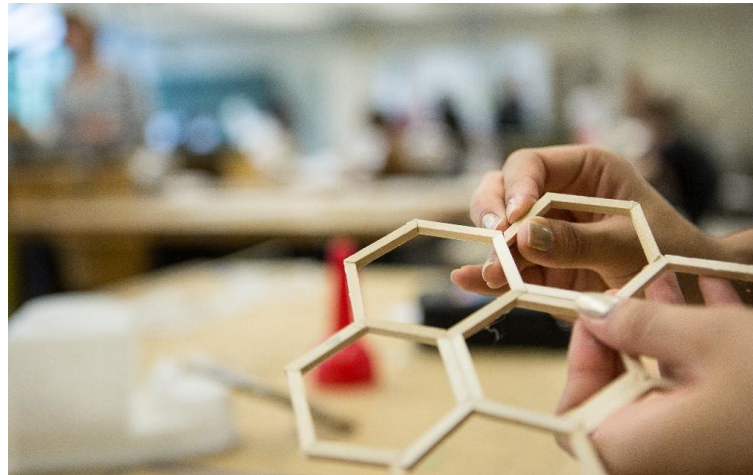
# **Blended Learning Part II**

# Hybrid Didactic Design



Students and lecturers share documents securely, upload assignments and communicate via online learning platforms.

International and local experts create high quality distance learning material for digital and analogue usage.



Teaching sessions in modern labs, in the classroom and online with international experts

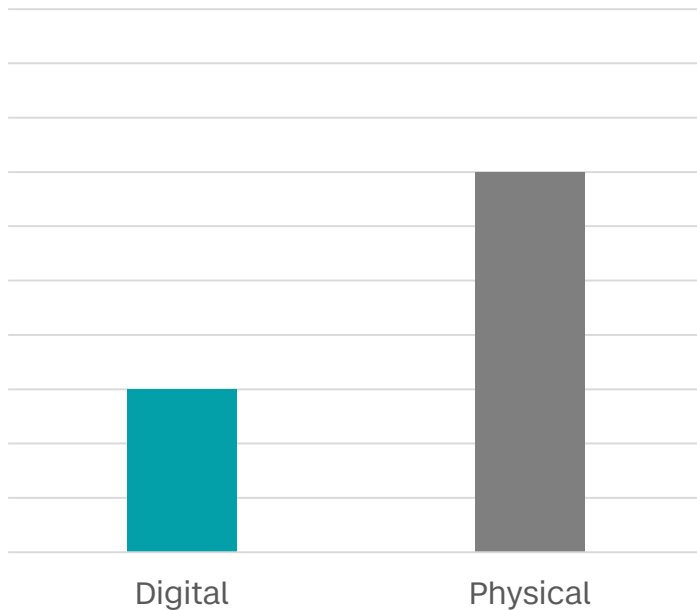
# Finding a fitting blend

## Physical Elements

- Focus on physical trainings and practical application
- Focus on good trainers and practical case studies
- Create learning projects over a longer time span (2-6 months)

## Digital Elements

- Use digital resources if available
  - Do not create new material
- Use existing online platforms for on-demand collaboration needs (google docs, MS Teams, etc.)



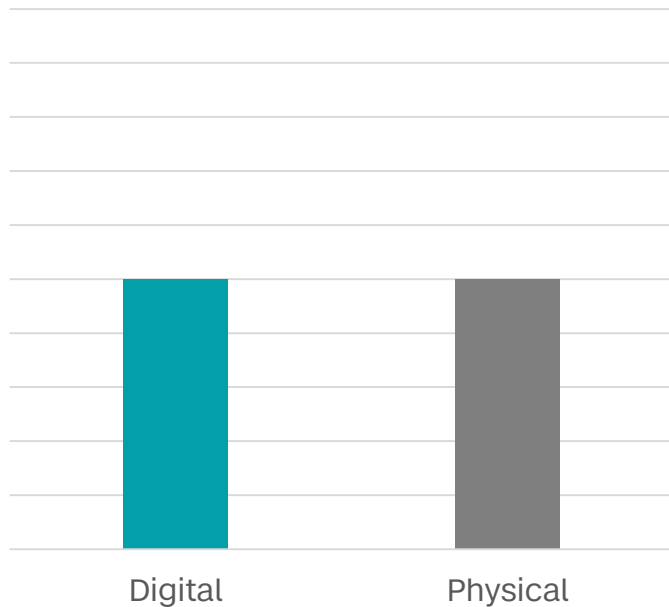
# Finding a fitting blend

## Physical Elements

- Focus on physical trainings and practical application
- Use existing trainers with specific expertise
- Get remote experts for missing fields

## Digital Elements

- Focus on a solid online collaboration platform
- Acquire remote experts for fields where local expertise is missing
- Create learning material for areas where local trainers are lacking





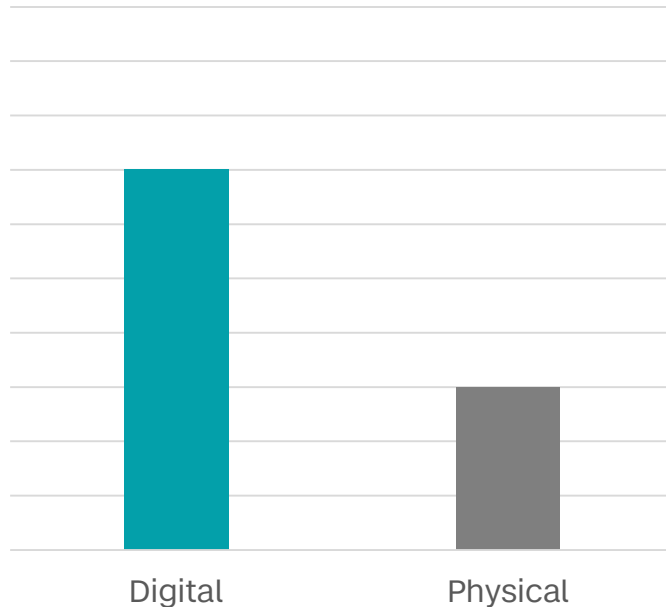
# Finding a fitting blend

## Physical Elements

- Focus on experienced experts delivering practical application
- Focus on on-the-job feedback

## Digital Elements

- Create customized e-learning resources for target group
- Involve international experts
- Use real life case studies with a local/regional application
- Utilize virtual collaboration to engage an international community of practice in the target group



**THANK YOU!**

**Questions?**

**BHT**

Berliner Hochschule  
für Technik

Studiere Zukunft

NEUE

HORIZONTE

BHT Berlin



We wish you gained  
new knowledge

**Prof. Dr. Florian Schindler**

**Instituto de Capacitación a Distancia**

Universidad de Ciencias Aplicadas y

Tecnología de Berlin

**Tel. +49 (0)151 1462 9850**

**E-Mail: [florian.schindler@bht-berlin.de](mailto:florian.schindler@bht-berlin.de)**

**Web: [www.bht-hochschule.de/fsi](http://www.bht-hochschule.de/fsi)**

