



**German University
of Digital Science**

Digital World – Digital Education

**Prof. Dr. Christoph Meinel, Founding President of the German
University of Digital Science**

MOOCs as Cornerstone for a Digital University

Digital Transformation isn't on its way, ... It is already here and we are not well prepared

Higher education institutions have great potential to contribute through appropriate offerings and partnerships¹

A different skill set than today will be needed for the digital future

What Skills Do Are Needed to Master the Digital Tomorrow?

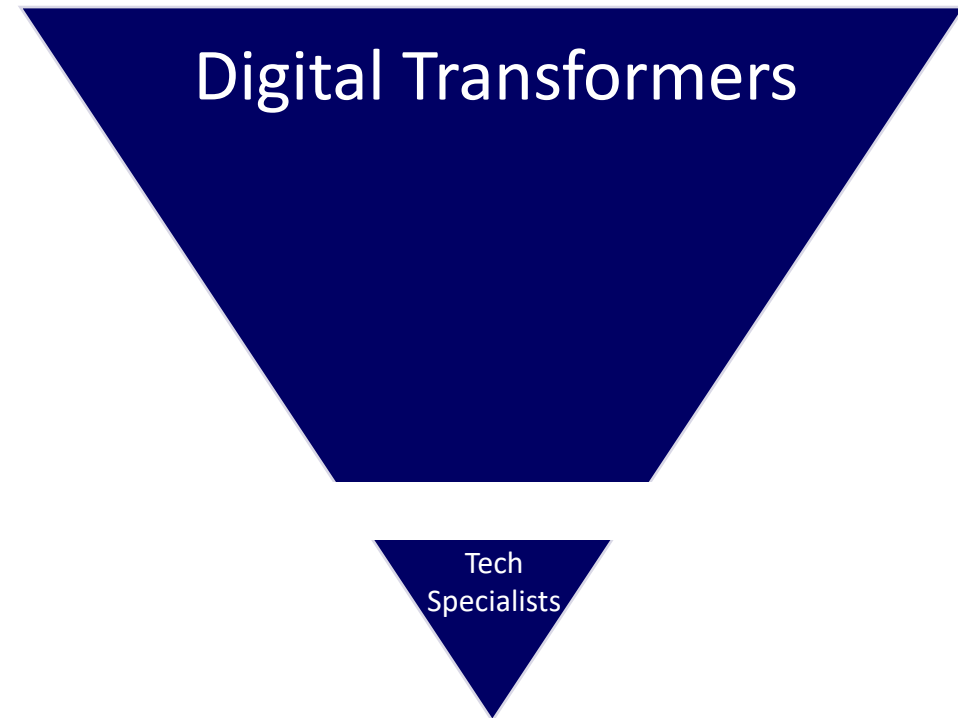


- Number of skills needed for a job increases by 10% per year¹
- One in three skills in an average job posting from 2017 in IT, finance or sales already outdated today¹
- 40% of the workforce needs retraining²

A different skill set than today will be needed for the jobs of tomorrow

Who Drives Digital Change in Organizations?

- Worldwide all-time shortage of skilled workers in digitalization hindering growth and innovation
- Digitalization is increasing the speed of production of new knowledge
- Demand for study programs and lifelong learning offers related to digitalization and digital technologies dramatically increased



How Can We Organize High-Quality Education of the Digital Transformers Worldwide?



- Goal 4 of the UN Sustainable Development Goals: Ensure inclusive, equitable, and quality education and promote lifelong learning opportunities for all
- Higher education institutions have great potential to contribute through appropriate offerings and partnerships¹

Scalable higher education offerings are the only way to meet global demand

Development of Internet and Devices Enables Tele-Teaching and E-Learning on Large Scale



IT-technologies provide completely new possibilities to set up future universities

Technique allows e-learning at a completely new level

- Exchange of Knowledge over the Internet year¹
- Efficient apps are available to communicate and collaborate
- Easy to use interactive devices
- Easy to generate and distribute multimedia content
- Social networks for social interaction

Future Universities are Needed to Educate People that Are Able to Create and Settle the Digital World



Historical Development of Universities – From University 1.0 to University 3.0 ...

■ **University 1.0:** Ancient Universities

- Very personalized and organized around mahatmas
- Students became followers of philosophers

■ **University 2.0:** Recent Universities

- Genesis with the upcoming book printing technology
- Build around the university's library
- Students are physically present, attend lectures, seminars, ...

■ **University 3.0** or the future of universities: Web-universities

- Genesis with upcoming IT technologies and emerging digital world
- Organized around Internet portals and platforms

How Does Higher Education Need to Change?



- Development of new target groups
- Research, testing and use of new digital teaching formats
- Development of study programs and teaching content with the inclusion of ‘future skills’
- Establishment of more flexible structures for research

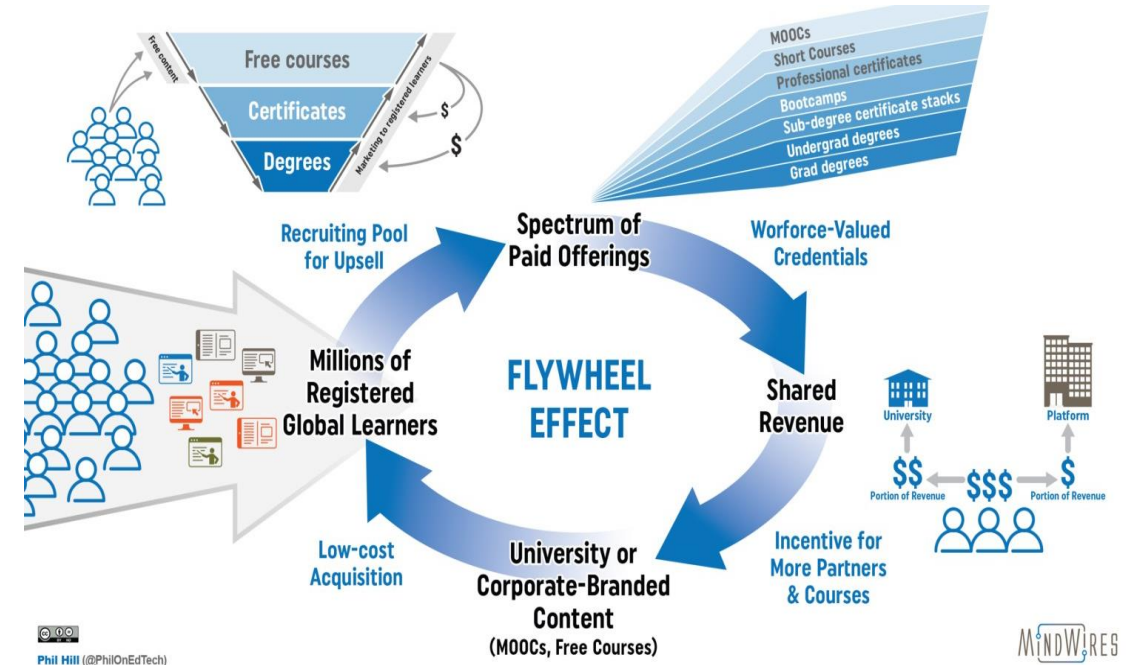
Digitization is differentiation

First structures of the University 3.0: MOOCs – Massive Open Online Courses



MOOCs - Disrupting Innovation in E-Learning

- MOOCs provide the missing social dimension in online learning and are an 'easy entry' for more comprehensive learning offers
- Relevant, scaling educational format for both individuals and organizations for upskilling and reskilling
- Effective contribution to addressing the shortage of skilled workers



MOOCs are part of the response to the changes brought about by digitization

MOOCs – Core Values?

Learner-centeredness

- The learner, not the technology, is the focus
- Features and course formats are designed from the learner's perspective

Social Learning

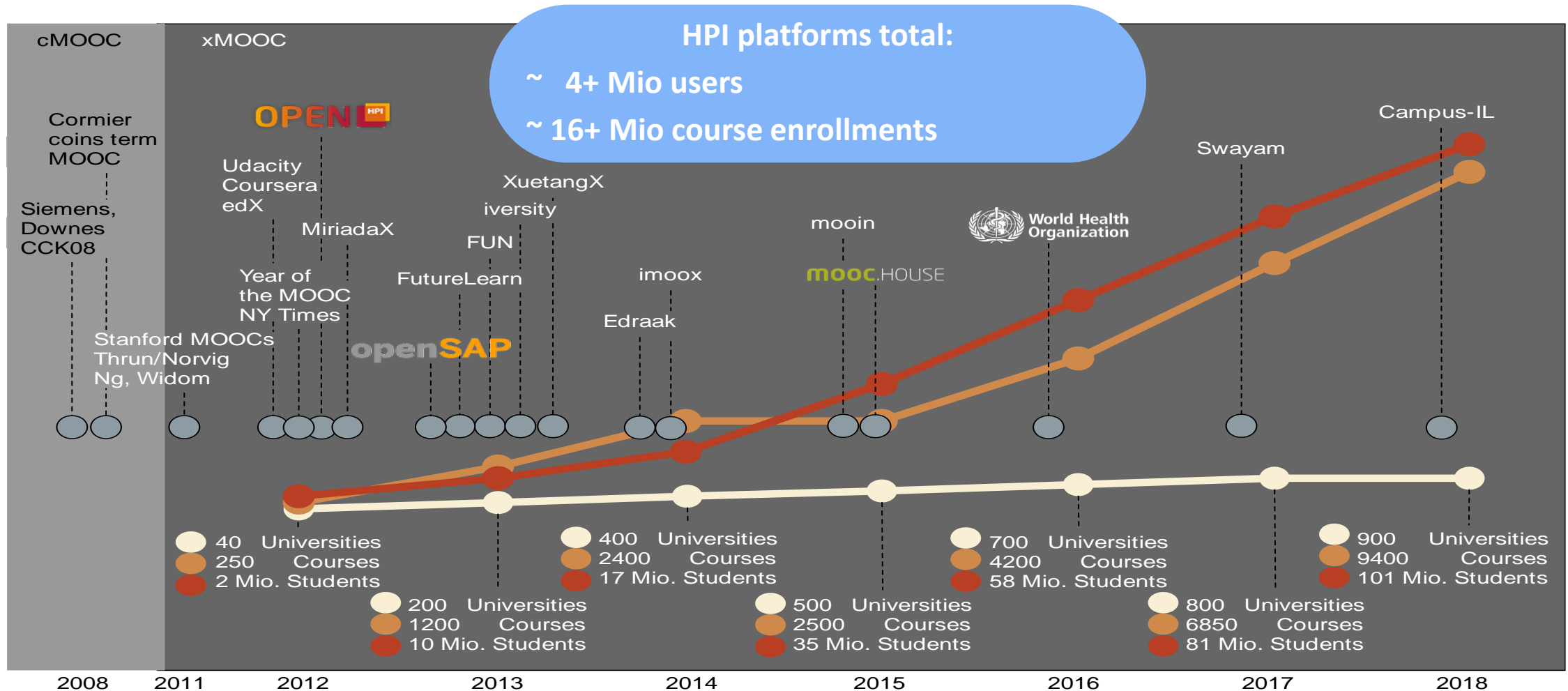
- Collaborative learning instead of excessive adaptively
- Fostering the course community

Research Driven Development

- Measurement and continuous optimization of success/failure of features and course formats
- Courage to take risks: leaving well-known paths in order to continuously improve learner experience

MOOCs are part of the response to the changes brought about by digitization

Timescale and Figures: MOOC Offers Around the World



openHPI – the First European MOOC-Platform

OPEN HPI Hasso Plattner Institut

About openHPI | FAQ | Register

openHPI: Interactive Online Information Technology Courses starting September 3rd 2012

register now

Welcome to openHPI

Welcome at openHPI

Sign up now for openHPI, the educational internet platform of the German Hasso Plattner Institute, Potsdam. Starting in September you will be able to take part in a worldwide social learning network based on interactive online courses covering different subjects in Information and Communications Technology (ICT).

Enter a fascinating world of knowledge with our free open online courses. Meet other participants from around the world and familiarize yourself with fundamental and current topics in ICT, computer science and IT systems engineering.

The openHPI platform is an ideal basis for the further development of online education

German University of Digital Science – Our Founding Initiative for a University “3.0”



German University of Digital Science – Educating to Master the Digital Transform

- Redesign education through the use of digital technology
- High-quality university education on digitization - accessible anywhere, anytime, and at scale
- Student-centered, challenge-based learning using innovative digital formats



A contribution to successfully shaping
digital change worldwide

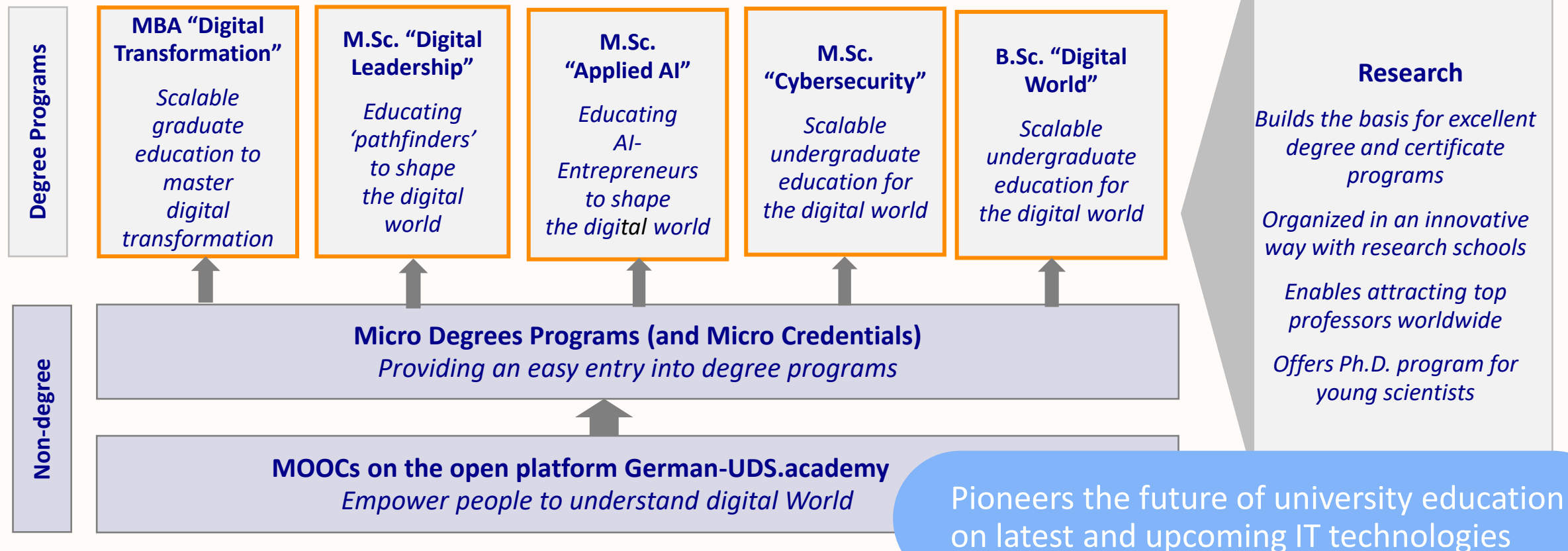
German University of Digital Science – A Completely Online Operating University

- Building all activities on latest and upcoming IT-technologies, e.g.,
 - Learning Analytics, Big Data
 - Artificial Intelligence
 - 3D full body avatars for the Metaverse /
 - Gloomins NFT
 - AR und VR classroom technologies
 - Blockchain ...
- Complementing the existing higher education system



A contribution to successfully
shaping digital change worldwide

German University of Digital Science – Teaching Knowledge to Master Digital Transform



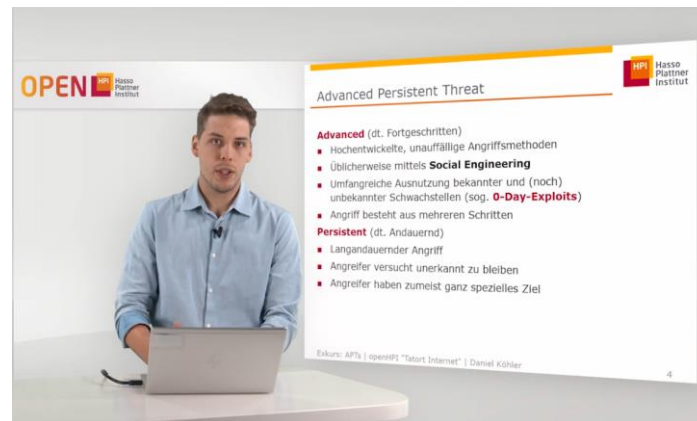
German University of Digital Science – Learning Through Mentored Self-Directed Learning

- Knowledge acquisition primarily through self-directed, asynchronous learning via videos combined with self-tests, (interactive) exercises or assignments
- Combination with innovative synchronous course formats and assignments (challenges)
- Mentoring program and student services to support globally distributed students



Student-centered, challenge-based learning oriented to the principles of design thinking

Building on Experiences of Online Education with *openHPI.de*



German UDS – Innovative Digital Teaching Formats Modules

M.BA Modules, 4 ECTS

Lecture Week (8 per Quarter)



Lecture Videos



Self-Tests



Course Material



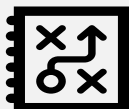
Graded Homework



Final Exam



Course (Discussion) Forums *to enable Student Exchange*



In-Depth Learning Challenge

B.Sc and M.Sc Modules, 5 ECTS

German UDS – Innovative Digital Teaching Formats

ECTS and Student Workload

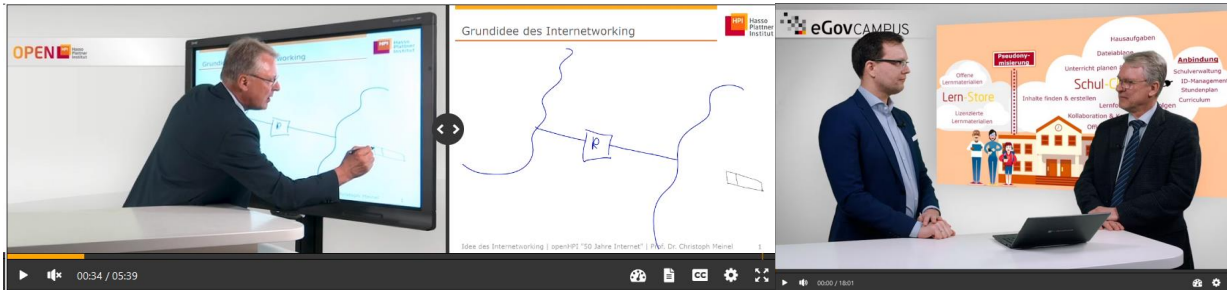
- **ECTS** (European Credit Transfer System) as instrument to size student workload across different institutions
- 1 ECTS at German UDS = approx. **25 hours** of student workload
 - includes self-study time for students
- Approximate total expected student engagement:
 - **125 h** - **B.Sc** and **M.Sc** modules
 - **100 h** - **MBA** modules

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Lecture Clips

■ Lecture Clips, 12-16 lecture week

- short & self-contained
- 8 – 12 min per video
- each week should contain 2-3 hours of lecture clips
- different presentation styles can be engaged



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Self-Tests

- **Lecture Clips**, 8-12 per module week
- **Self-Tests**, ~ 1 per course video
 - 4-5 questions per lecture clip
 - immediate reiteration of new knowledge
 - helps students assess, whether they *actually* understood the content
 - re-acquires student focus between multiple lecture videos
 - **ungraded (!)**
 - multiple-choice, interactive exercises, programming exercises, ...



■ Daniel Köhler
HPI, Potsdam

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Course Materials

- **Lecture Clips**, 8-12 per module week
- **Self-Tests**, ~ 1 per course video
- **Course Material** to foster self-study
 - Additional literature:
 - script
 - workbooks, textbooks
 - online articles & links
 - Multimedia elements, (online) videos, podcasts, ...
 - Deep-Dives
 - ...



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Weekly Graded Homework

- **Lecture Clips**, 8-12 per module week
- **Self-Tests**, ~ 1 per course video
- **Course Material** to foster self-study
- **Weekly graded Homework**, 1 per week
 - Should require ~ 1 h to solve
 - Plus 1-2 h student preparation
 - Serves to **verify** student understanding throughout module
 - Usually of similar form to self-tests:
 - Multiple-choice exercises
 - ...



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Forum Interaction

- **Lecture Clips**, 8-12 per module week
- **Self-Tests**, ~ 1 per course video
- **Course Material** to foster self-study
- **Weekly graded Homework**, 1 per week
- **Forum Interaction**, 1-2 prompts / week
 - Interaction with fellow students crucial for distance learning
 - Thought-provoking prompts to spark forum interaction
 - Students expected to spend approx. 1-2 h / week in forum



German UDS – Innovative Digital Teaching Formats

Final Examination

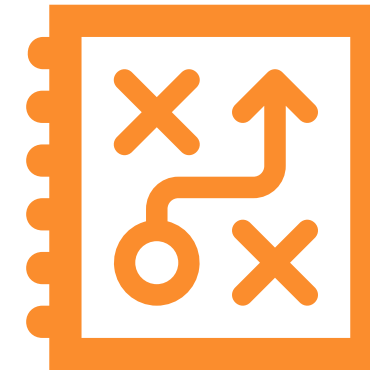
- **Lecture Clips**, 8-12 per module week
- **Self-Tests**, ~ 1 per course video
- **Course Material** to foster self-study
- **Weekly graded Homework**, 1 per week
- **Forum Interaction**, 1-2 prompts / week
- **Final Examination**
 - 2 hours time, 2-5 hours expected workload
 - Shall contribute to student final course performance
 - Type of questions should be in-line with self-tests



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Learning Challenges

- ▶ **Lecture Clips**, 8-12 per module week
- ▶ **Self-Tests**, ~ 1 per course video
- ▶ **Course Material** to foster self-study
- ▶ **Weekly graded Homework**, 1 per week
- ▶ **Forum Interaction**, 1-2 prompts / week
- ▶ **Final Examination**
- ▶ **Learning Challenge(s)**
 - in-depth exercise/challenge to be solved (in teams)
 - 25 – 60 h of individual workload
 - ...

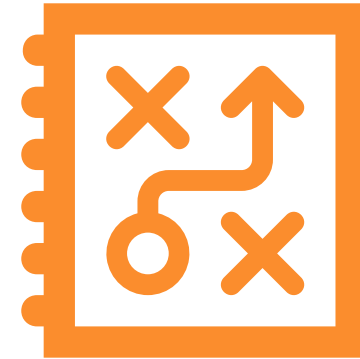


▶ Daniel Köhler
HPI, Potsdam

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Examples fo Learning Challenges (1/2)

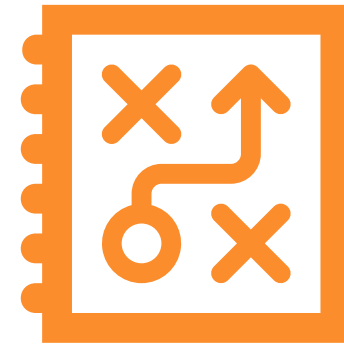
- Single- & Group-Challenges
- Action- / Project-prompts to trigger students' self-guided engagement
- Should contribute to student's performance
 - depending on course size and scalability, assessment could be done manually, or as peer assessment
- Various outcomes / deliverables possible
 - presentations, videos, essays, (code) artifacts, ...
- Task & outcome are significantly dependent on the module
 - *exemplary challenges and tasks on the next slide*
 - ...



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Examples of Learning Challenges (2/2)

- Development of a Software Product in Programming Education
- Creating a Business Plan for a (new) digital product
- Deriving a marketing strategy for a start-up
- Assessment of current developments in (Gen-) AI
- Comparison of (contemporary) digital strategies of ...
- ...



German University of Digital Science – All Degree Programs Cover Future Professional Skills

- Degree programs at all qualification levels:
MBA, B.Sc., M.Sc., PhD
- Fundamentals of digital technologies and their application in various areas of society including programming
- Professional/Future Skills:
Design Thinking, Complex Problem Solving, Entrepreneurial Thinking, Business Management



Graduates leave the university as
'Digital Transformers'

German University of Digital Science – Research is Organized in Highly Agile Research Centers

- Research focus on topics of digital transformation, e.g. learning analytics and digital education, artificial intelligence, digital entrepreneurship, digital health, digital energy, ...
- Professors and scientists are distributed worldwide and cooperate in highly flexible Research Centers
- Research Centers are organized around by Research Schools



Pioneers the future of university research
on latest and upcoming IT technologies

German University of Digital Science – Main Building and Labs are Home in the Metaverse

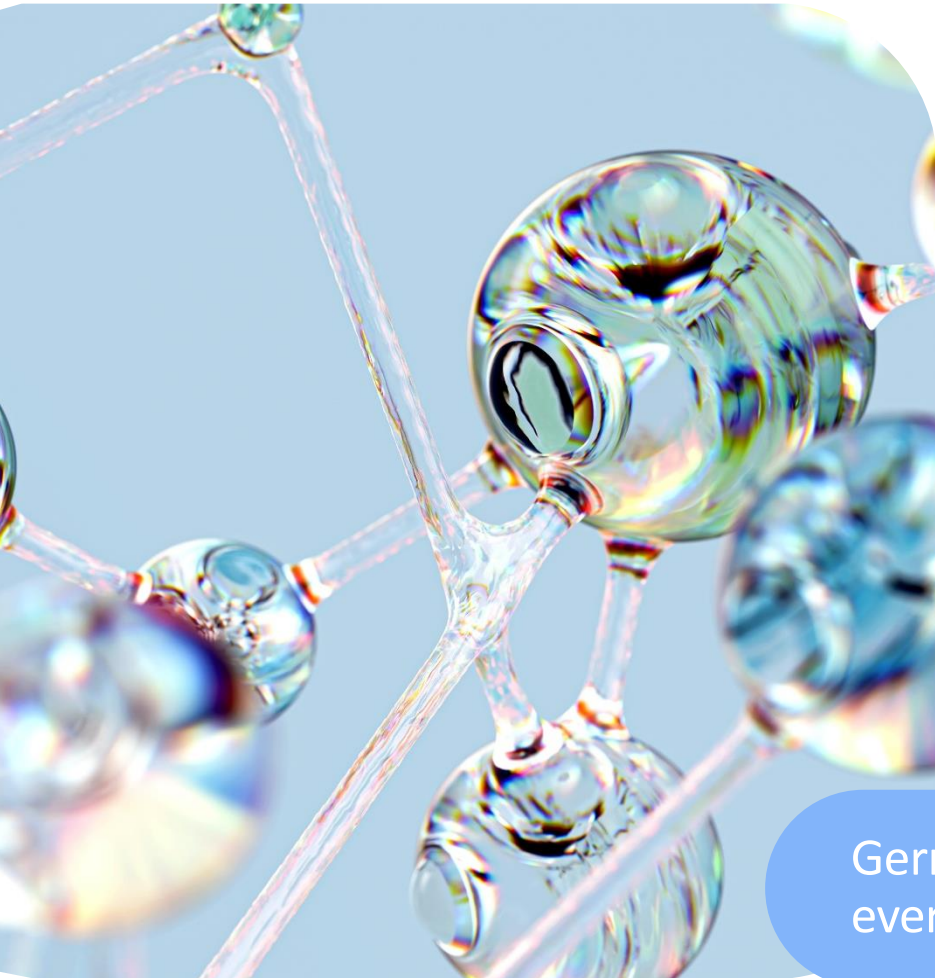
- Further development and increased use of VR/AR technologies in education
- Combination of asynchronous, synchronous, online, and on-site formats
- Trend toward immersive learning experiences in virtual space to teach a variety of skills¹



Making the best out of both worlds,
the virtual and the physical one

German-UdS.Academy – open MOOC-Platform of the German UDS.

Intention: Contribute to Digital Enlightenment of the People



German-UDS.academy provides open and free courses (MOOCs) for everyone

- Didactically structured with learning videos, collab spaces, discussion forums, peer (group) assessment, gamification elements, ...
- Certificates at university level
- Use of a Open edX platform
- Internationally recognized research on MOOCs, digital education and knowledge engineering

German-UDS.academy is open for every one

German-UdS.Academy – open MOOC-Platform of the German UDS.

Intention: Contribute to Digital Enlightenment of the People

German-UDS.academy has started in May 2024 and It offers

(1) Open courses: Excellent interactive online courses (MOOCs) for the general public

(2) Micro degree programs certified by 5 ECTS: For a great content range for continue education and life-long learning

(3) Academic study programs: For its students from allover the world

(4) Consulting Services related to digital content production workflows

German University of Digital Science as well as the *German-UDS.academy* are using the well proved and tested interactive open-source Internet platform **Open edX**

Digital World – Digital Education



Prof. Dr. Christoph Meinel

christoph.meinel@german-uds.de & meinel@hpi.de

Co-Founder of the **German University of Digital Science**