



**German University  
of Digital Science**

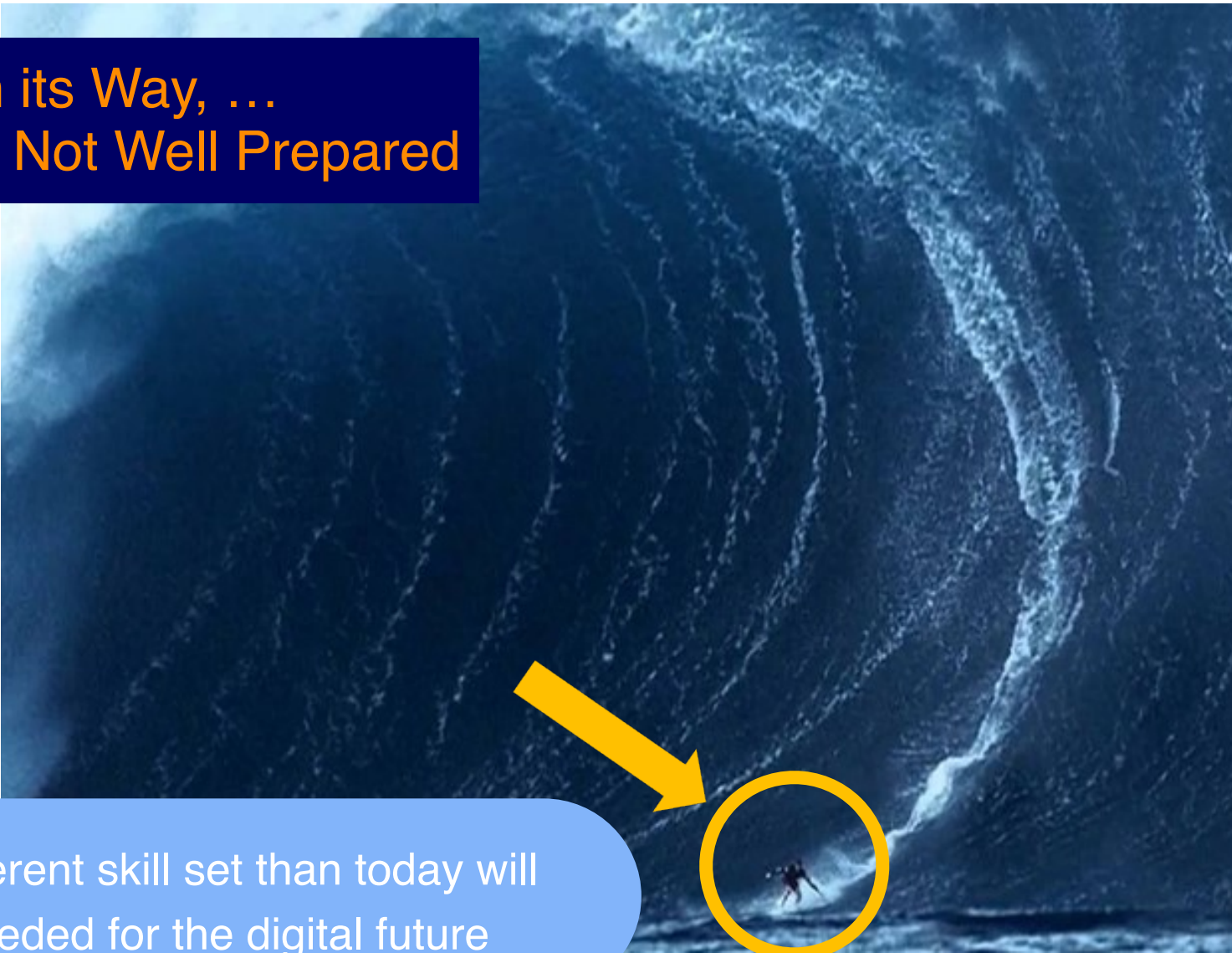
# Digital World – Digital Education

MOOCs as Cornerstone for a Digital University

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

# 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 partnerships<sup>1</sup>



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

# What is the Impact of Digital Technologies?

- Changing Communication
- New business models, products and services
- Knowledge creation is exploding
- ...

Right use of digital technologies can contribute to solve the global political and social challenges

Organizations worldwide urgently need appropriately trained professionals



# What Skills are Needed for the Digital Tomorrow?

- Number of skills needed for a job increases by 10% per year<sup>1</sup>
- One in three skills in an average job posting from 2017 in IT, finance or sales already outdated today<sup>1</sup>
- 40% of the workforce needs retraining<sup>2</sup>

-  Analytical thinking and innovation
-  Active learning and learning strategies
-  Complex problem-solving
-  Critical thinking and analysis
-  Creativity, originality and initiative
-  Leadership and social influence
-  Technology use, monitoring and control
-  Technology design and programming
-  Resilience, stress tolerance and flexibility
-  Reasoning, problem-solving and ideation

A different skill set than today  
will be needed for future jobs

<sup>1</sup> „Leveraging Skills Adjacencies to Address Skills Gaps“, Gartner, 2021

<sup>2</sup> Future of Jobs Report 2020, World Economic Forum

# 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

Digital  
Transformers

Tech  
Specialists

It is only possible if everyone works together:  
Tech specialists and digital transformers



## How Can we Organize High-Quality Education of 'Digital Transformers' Worldwide?

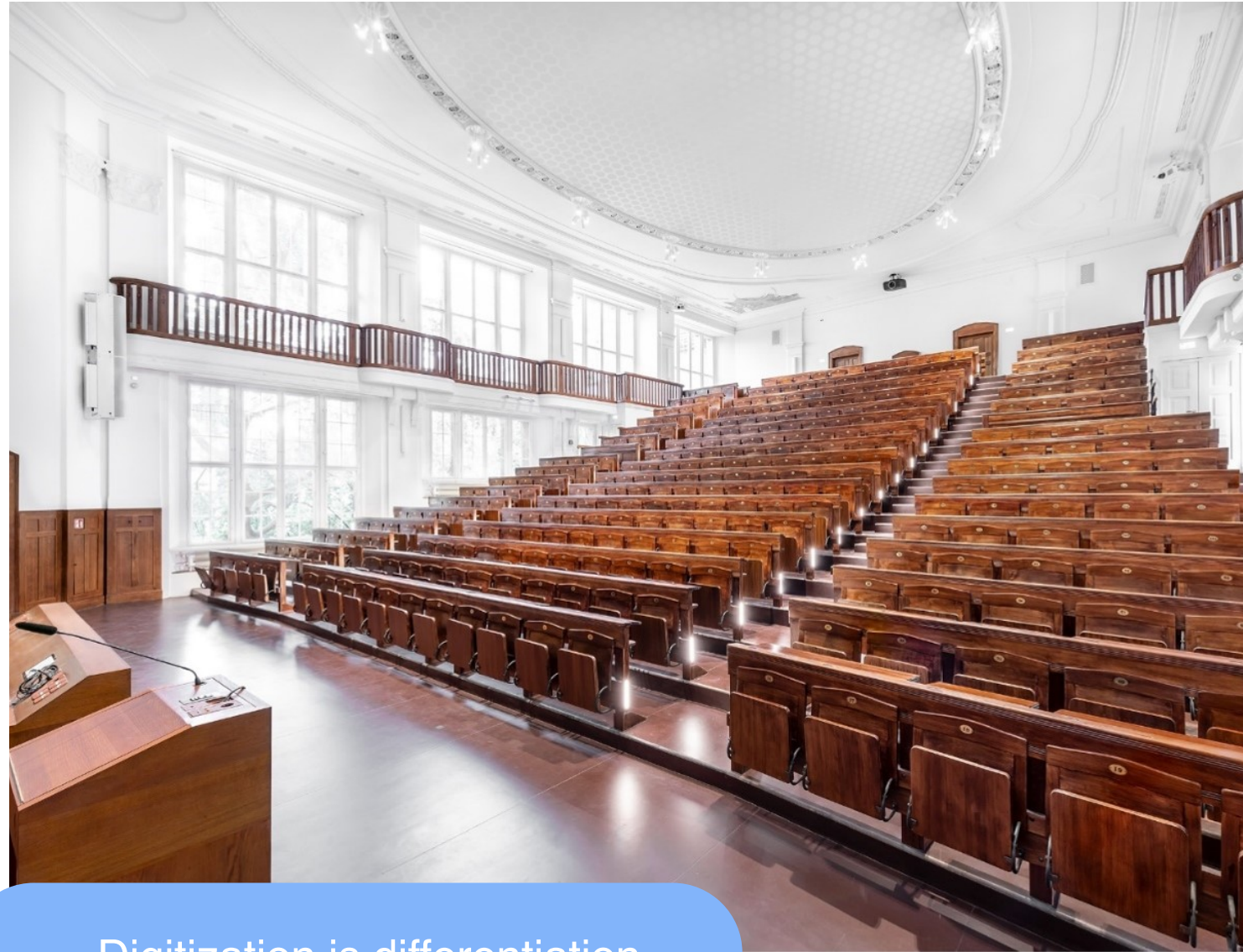
- Goal 4 of the UN Sustainable Development Goals: Ensure inclusive, equitable, and quality education and promote lifelong learning opportunities for all
- Higher education institutions have great potential to contribute through appropriate offerings and partnerships<sup>1</sup>



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

# 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

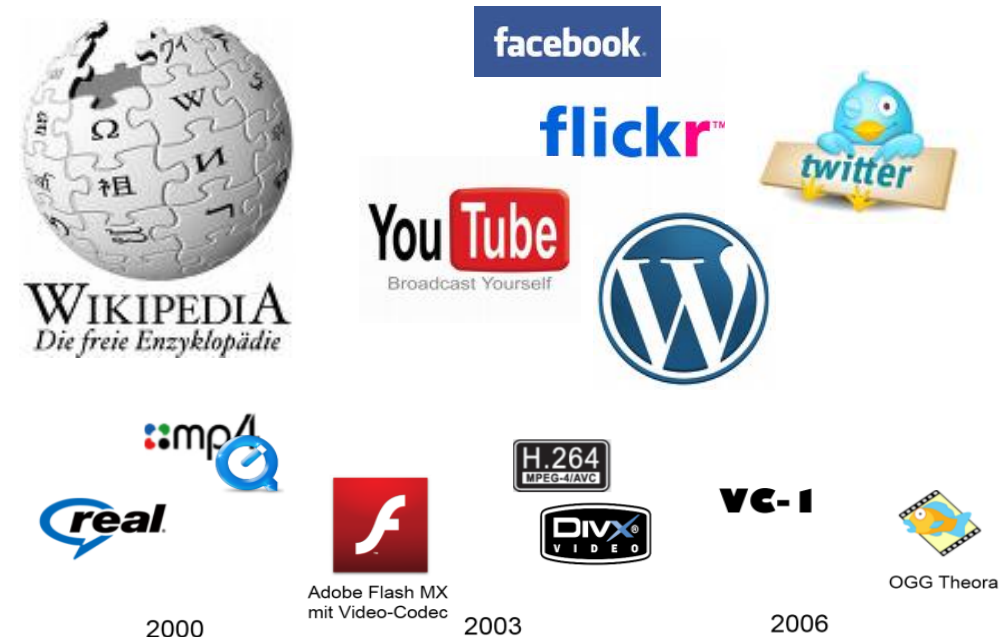


Digitization is differentiation

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

Technique allows tele-teaching and e-learning at a completely new level

- Free Exchange of Knowledge over the Internet
- 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



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



# 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

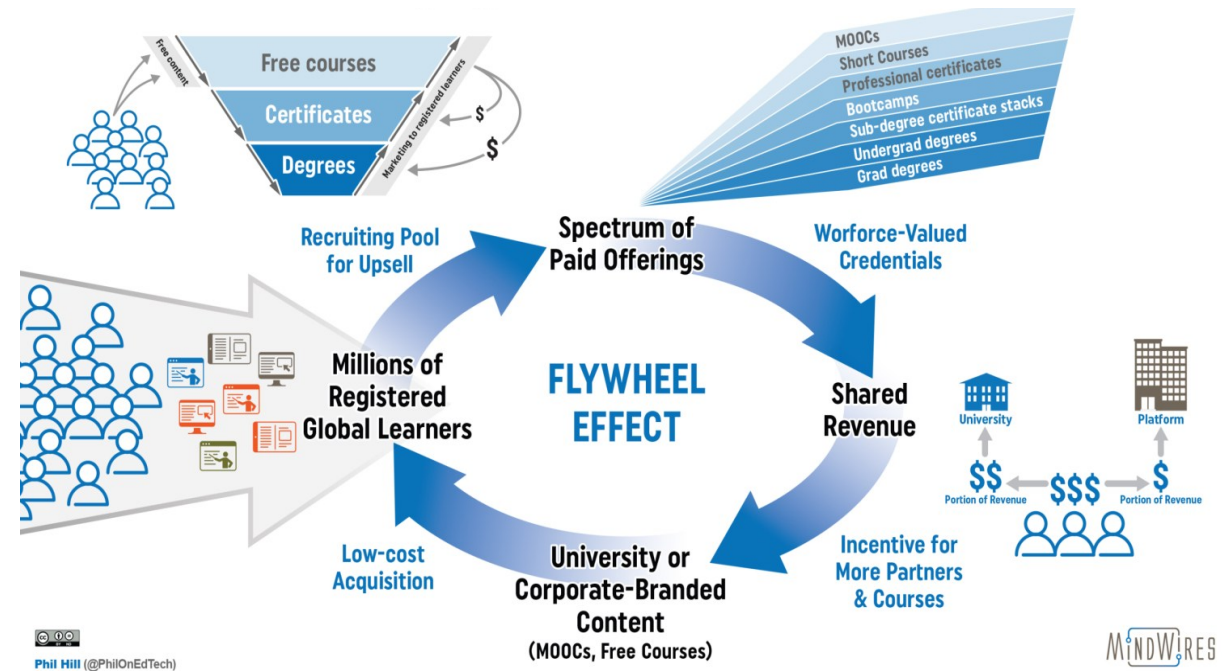
The present provides a historical need  
and chance to re-think universities

# 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

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

## Social Learning

- Collaborative learning instead of excessive adaptation
- 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

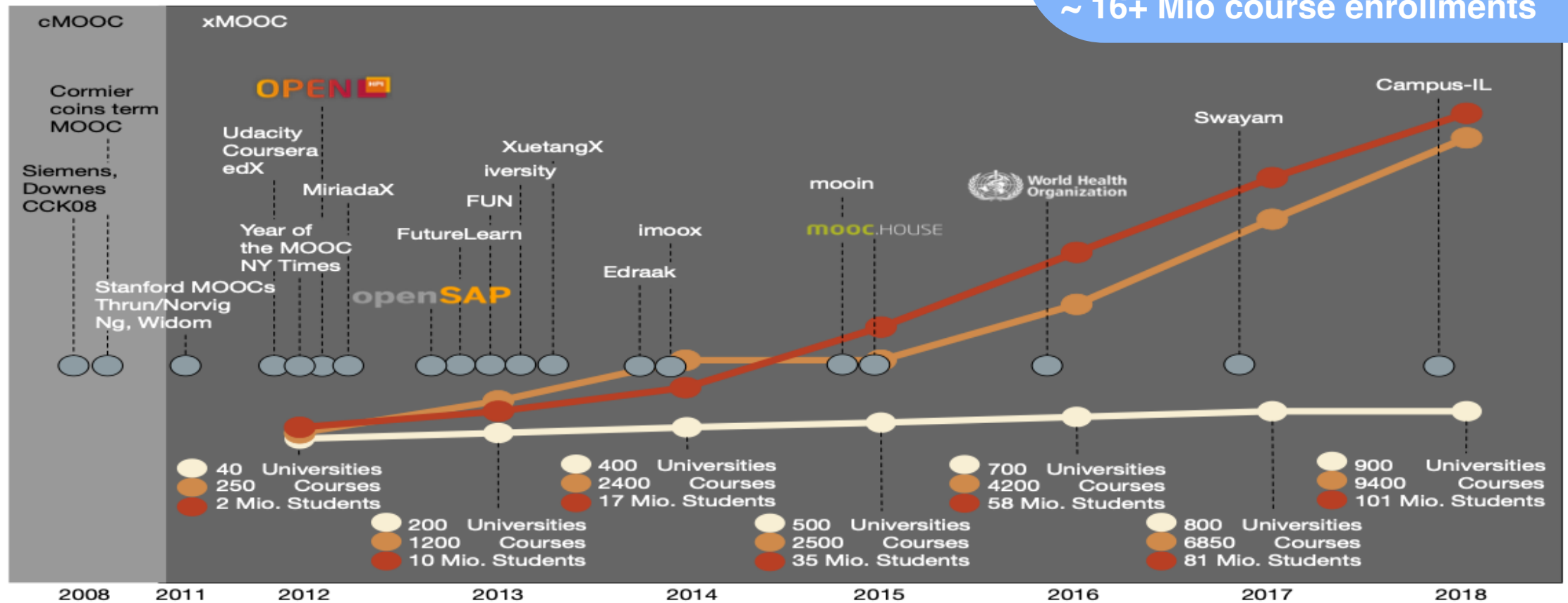


MOOCs are part of the response to the changes brought about by digitization



# Timescale and Figures: MOOC Offers Around the World

HPI platforms total:  
 ~ 4+ Mio users  
 ~ 16+ Mio course enrollments



# openHPI – Our Approach to Design and Operate the First European MOOC-Platform

**OPEN HPI** Hasso Plattner Institute

About openHPI | FAQ | Register

**openHPI: Interactive Online Information Technology Courses starting September 3<sup>rd</sup> 2012**

register now

**Welcome to 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 provided us a lot of experience in online education

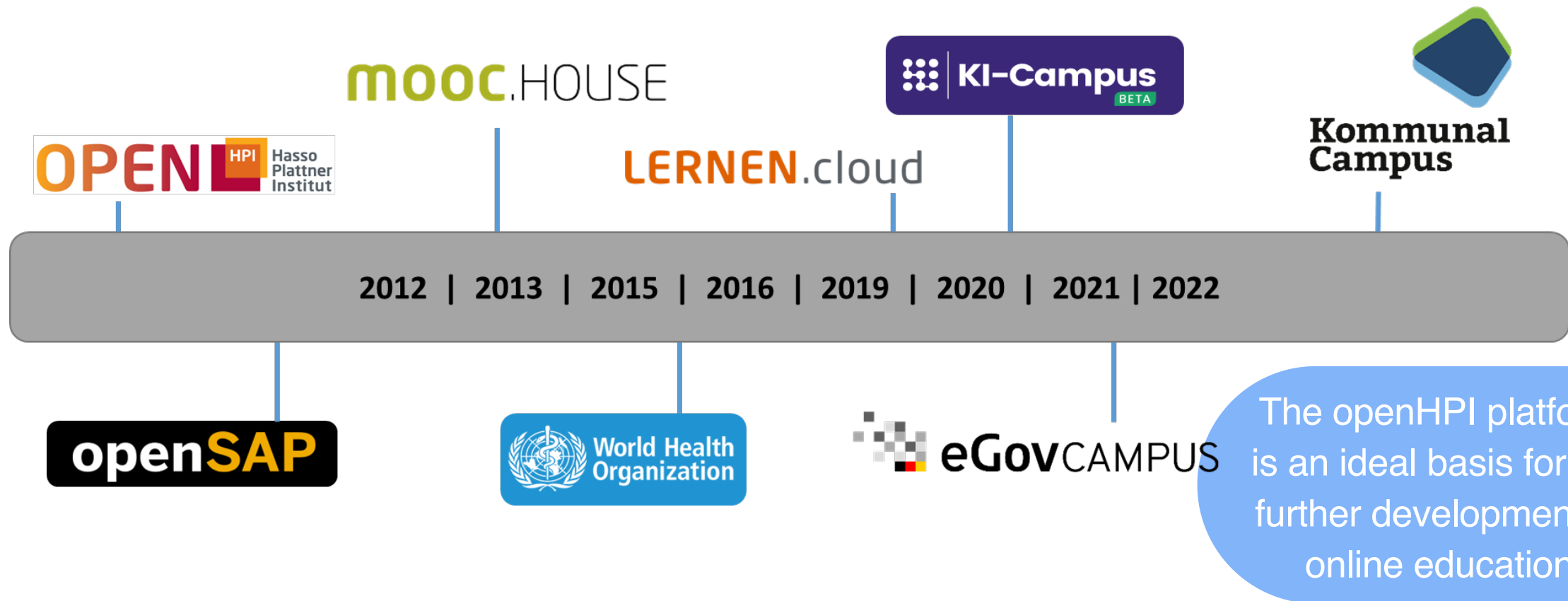
# What does the openHPI Platform Designed in 2012 Deliver? We Called it Digital Enlightenment ...

- More than 10 years didactically structured with learning videos, collab spaces, discussion forums, peer (group) assessment, gamification elements, ...
- Certificates at university level
- Internationally recognized research on MOOCs, digital education and knowledge engineering

Platforms like openHPI provide an ideal basis for the further development of online education



# The openHPI Platform Family: Altogether 16+ Mio. Enrolled Learners

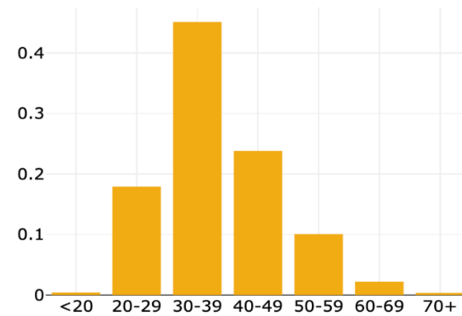




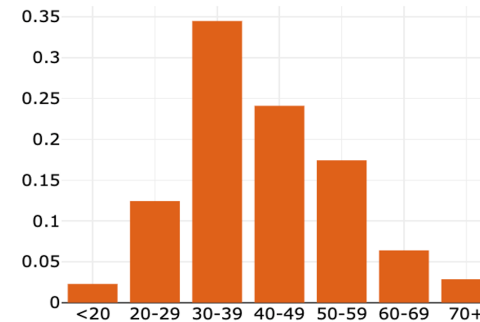
# Learning Offers at openHPI: Age Distribution

openSAP

Age Distribution



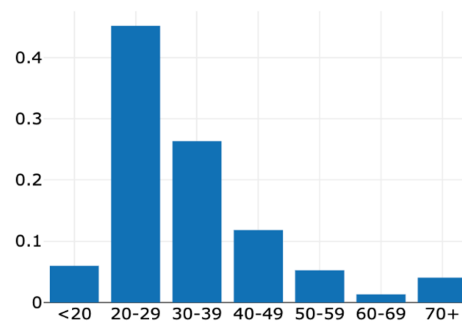
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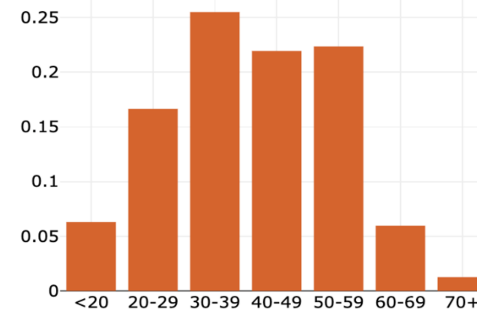
openHPI

OpenWHO

Age Distribution

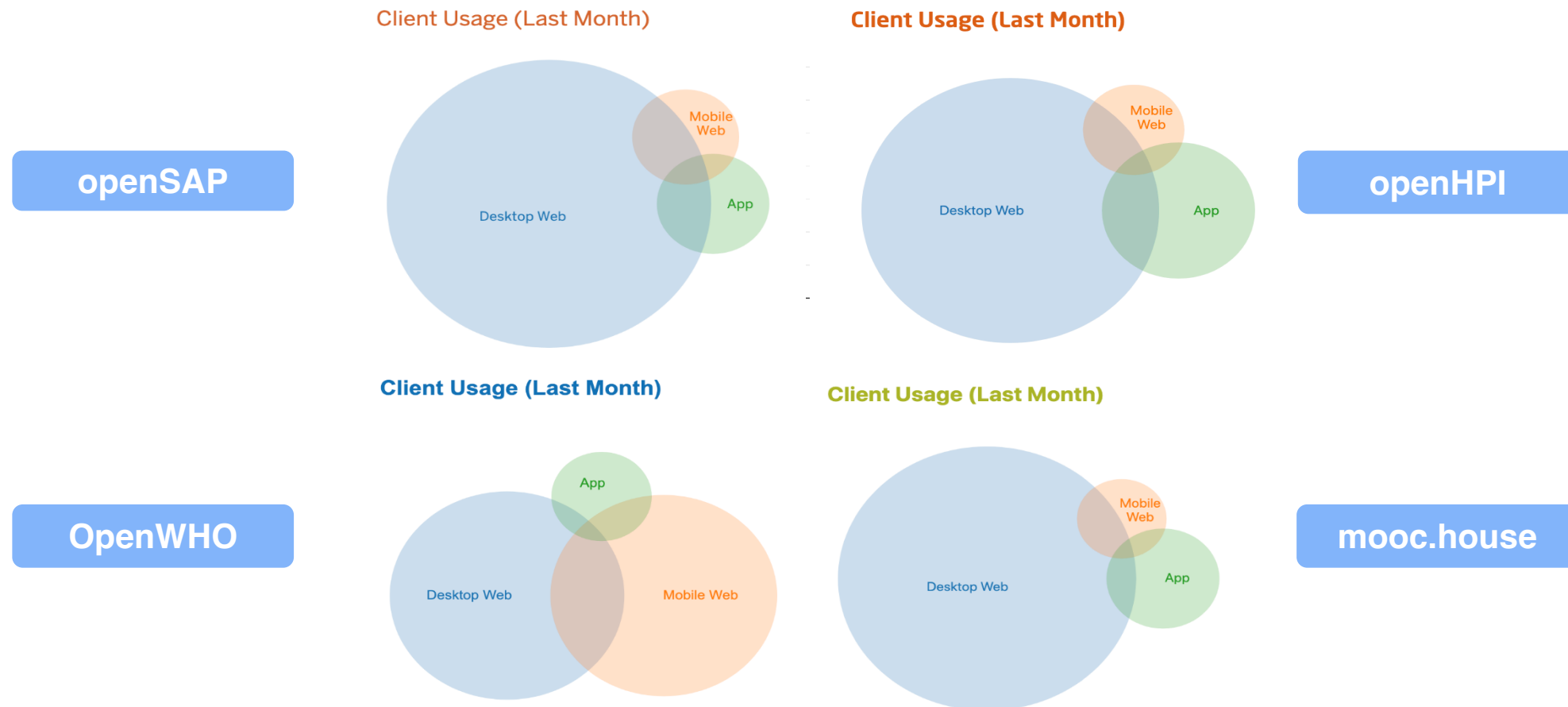


Age Distribution



mooc.house

# Learning Offers at openHPI: Usage: Web – Mobile – App



# Various New Learning Formats Have Proven Themselves on MOOC Platforms and Other Digital Learning Platforms

## **(1) Knowledge Essential:**

- Primarily asynchronous presentations by the lecturer
- Introduction into new topics
- Rather little amounts of deflection and discussion by students
- Strictly structured
- Easily scalable

## **(2) Experiences:**

- Strengthen previous knowledge
- Less presentations by lecturer
- Small (Group-based) research / reflection tasks

# Various New Learning Formats Have Proven Themselves on MOOC Platforms and Other Digital Learning Platforms

## (3) Deep Dives:

- In-depth work of students on (own) topics
- Framework for project work of various kinds
- Lecturer primarily observation and guidance role

## (4) Mastery: Coding

- Module to teach programming
- Few content input sessions by lecturer
- Many practical (group-based) programming exercises

## (5) Mastery: Social & Future Skills

- Teaches soft-skills such as *presentation* or *project management*
- Hugely depends on synchronous group-assignments



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



# German University of Digital Science – Training to Master the Digital Transform

- Innovative digital teaching formats like MOOCs, ....
- Online degree programs (MBA, M.Sc., B.Sc.) in Digital Transformation, Leadership, Entrepreneurship, ...
- Global, interdisciplinary research redefined in worldwide research center in digital engineering, digital health, digital energy, digital education, ...



Pioneers the future of university on  
latest  
and upcoming IT technologies



# German University of Digital Science – A Completely Online Operating University

- Building all activities on latest and upcoming IT-technologies, e.g.,
  - 3D full body avatars for the Metaverse / Gloomins NFT
  - Artificial intelligence and learning analytics
  - Virtual 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**

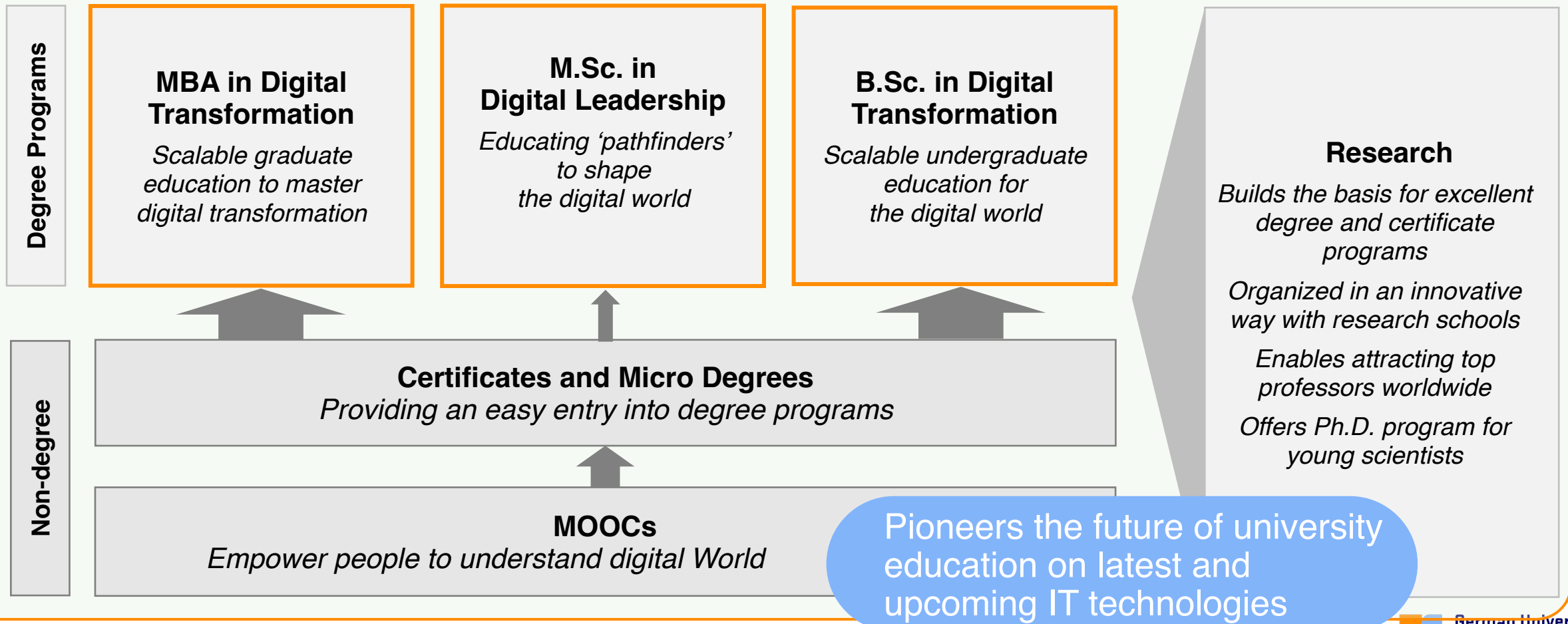
- Redesign education through the use of digital technology
- High-quality university education on digitization - accessible anywhere, anytime, and at scale
- Student-centered, challenge-based learning using innovative digital formats



A contribution to successfully shaping digital change worldwide



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



# German University of Digital Science – Research Organized in Highly Flexible 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 of PhD schools

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

# German University of Digital Science – 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, Entrepreneurial Thinking, Business management



Graduates leave the university  
as 'Digital Transformers'

# 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



## 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 skills<sup>1</sup>



Making the best out of the virtual  
and the physical world

<sup>1</sup> <https://www.pwc.com/us/en/tech-effect/emerging-tech/virtual-reality-study.html>

# MOOCs as Cornerstone for a Digital University

## Thank You for Your Interest!



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