Online Learning in Digital Era: Opportunities and Challenges

Experiences in Germany

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Challenges and Opportunities during the Pandemic Year

A man with dark hair is looking intently at a futuristic digital interface. The interface is filled with various data visualizations, including bar charts, pie charts, and circular gauges, all rendered in a vibrant blue and green color scheme. The background is dark, making the glowing digital elements stand out.

Challenges in Industry 4.0

Implication of Industry 4.0 on Jobs

- Some jobs won't exist anymore, even service based jobs
- Less amount of jobs and more specialized jobs
- Freelancers as a new form of permanent employment?

Surprisingly, These 10 Professional Jobs Are Under Threat From Big Data

Implication of Industry 4.0 on Entrepreneurship

Implication on Education

Technical education

- No interdisciplinarity, no innovation
- Adaptability to rapid changes and life long learning
- IT skills are the key to survive.

Entrepreneurship

- Collaboration in the „global village“
- Taking risks and dealing with uncertainty
- Responsible **creativity**

Adaptive learning

- Individualization
- Multi access
- Flexible curriculum and recognition of credits from **various education providers**

Higher Education in Germany

Bidirectional Relationship between Industry and Higher Education

- **Recruitment of professors**
- Research contracts and funding
- Visiting lecturers
- **Accreditation**

- Internships
- Research transfer
- Consulting
- Supply of skilled labors

The Comparison between Indonesian and German Lecturer

Qualification	S2 or S3	++ S3 ++
Linearity vs. transdisciplinary	Linearity is important	Transdisciplinary is strength
Decision maker in recruitment	Policy makers	Users: colleagues, industry, students, ...
Authority	According to rules from government/policy makers	<i>Freedom of teaching and research</i>
Access to resources	Resources are managed by „home base“, e.g. study program, faculty	Resources are managed by the professor
Teaching load	12 SKS?	9/10 SWS (Uni), 18 SWS (FH/UAS)
Performance evaluation	Standardized (nationally)	Based on agreement by considering strengths and weaknesses
Career mobility: industry - academia	Generally not possible	Encouraged

Education

Sumber: US Department of Defense

The Messenger of Allah (saw) said,
**'Whoever travels a path in search of knowledge,
Allah will make easy for him the path to Paradise.
Verily, the angels lower their wings for the seeker of
knowledge. The inhabitants of the heavens and earth,
even the fish in the depths of the water, seek forgiveness
for the scholar. The virtue of the scholar over the worshipper
is like the superiority of the moon over the stars.
The scholars are the inheritors of the Prophets. They
do not leave behind gold or silver coins, but rather
they leave behind knowledge. Whoever has taken hold
of it has been given an abundant share'.**

(Abu Dawud)

Image: <https://muslimhands.org.uk/>

Higher Education Curriculum Development

General stages of curriculum development

Example of Curriculum Development

Goals	Characteristics to be achieved	Chosen instruments
Academic quality	Teaching quality	<ul style="list-style-type: none"> ▪ Academic integrity rules ▪ Professor recruitments ▪ Onboarding for faculty members ▪ Learning format ▪ Choice-Core-Career (CCC) system ▪ Academic advising
	Studiability	
Personality development	Personal competence	<ul style="list-style-type: none"> ▪ Interdisciplinarity ▪ World track ▪ Campus life ▪ Learning format ▪ Communities
	Social competence	
Internationality	Cultural diversity	<ul style="list-style-type: none"> ▪ International classess ▪ International mobility ▪ International campus ▪ Intercultural training and conseling
	Intercultural competence	
Professional qualification	Professional competence	<ul style="list-style-type: none"> ▪ CCC system ▪ Triangle ▪ World track ▪ Project courses ▪ Projects with industry ▪ Internships ▪ <i>Career service center</i>
	Interdisciplinary competence	

3C Concept

Source: Jacobs University

Example of Schematic Study Plan

Overview of Learning Process

(Hall & Kidman 2004)

How Learning Process Works?

Conventional Way of Learning

Learning = storing the information

Source: KIT

Modern Way of Learning

Learning Strategy „Sandwich“

1. The lecturer points to a topic or context
2. The lecturer provides input
3. Reflection / processing by students individually / subjectively
4. Synchronization: matching / discussing the results of reflection
- ...
- X. The lecturer gives conclusions

A woman with dark hair, wearing a white lab coat and gloves, is looking through a microscope in a laboratory. The background is slightly blurred, showing other lab equipment and a teal wall. The right side of the image has a dark grey overlay with the word 'Research' in white text.

Research

الْعِلْمُ يُؤْتَى وَلَا يَأْتِي
"Knowledge doesn't come,
but you have to go to it."
- Imam Malik

Education.

The Prophet Muhammad ﷺ
said:

"For him who follows a path for seeking
knowledge, Allah will ease for him the path
to Paradise."

(Muslim)

Research in the University

- Funding sources:
 - Basic funding: state, endowment
 - From public institution (EU, federal ministries, DFG)
 - From industry through research contracts
- Management and development are conducted by institute, research groups/ chairs
- The organization of research is independent from the study programs

Synergies between Research and Education

Education ⇒ research

- Professor's research topics are broken down into doctoral / postdoctoral research topics => undergraduate and postgraduate thesis
- Thesis credits: Bachelor 15 ECTS ($\pm$ 450 hours), Master 30 ECTS ($\pm$ 900 hours)
- The advisor is the reviewer. The focus of the assessment is the process, not the end result.

Research ⇒ education

- Freedom of research and teaching: lecturers can teach courses that contain the dissemination of research results
- The research topics becomes the motivation for the courses

Name						First Name:								
Topic:		How do bonus programs affect the customer behaviour towards sustainable packaging: A survey based consumer behaviour analysis												
Scales					Weight	Extremely Negative			Extremely Positive			Points x Weight		
						1	2	3	4	5	6	7		
1. Problem Definition					3.0							x	21	
Explicit Definition of the topic • Outline/ delineation of the topic														
2. Scientific Methods					3.0							x	21	
Clarification of scientific instruments • Usage/ adoption of methods														
3. Systematic Approach					3.0							x	21	
a) Structure (Design) b) Train of thought (Central theme/ conclusiveness)						(1,5) (1,5)								
4. Problem solving					5.0							x	35	
Completeness of tasks • Reasoning of statements • Traceability • Originality														
5. Literary Foundation					2.0							x	12	
International literature • Journals • Monographs														
6. Linguistic Presentation					2.0							x	12	
Conciseness of expressions • style • Compliance to writing norms														
7. Citations					1.0							x	7	
8. Thesis Appearance					1.0							x	7	
Indices • Tables • Figures • Text • Evidence														
					Σ 20								Points:	136
Points	20-62	63-69	70-76	77-83	84-90	91-97	98-104	105-111	112-118	119-125	126-132	133-140	Result	%
Grade	5.00	4.33	4.00	3.67	3.33	3.00	2.67	2.33	2.00	1.67	1.33	1.00	1.00	97%

Transfers

**"The best among
you are those
who bring
greatest benefits
to many
others."**

Hadith Meal

**“Knowledge
is not measured by
how much is memorized,
but rather by how much
it is acted on.”**

(Imam Shafi)

Open Innovation Model

(Tidd & Bessant, 2009)

Integration of Education Curricula into Innovation

Bundesministerium
für Wirtschaft
und Technologie

EXIST
Existenzgründungen
aus der Wissenschaft

- Startup founder scholarship
- Grants for transfer from research to start-up
- Support of start-up culture in university

Example of successful startups

OPENEXPERIENCE

SHAREMAC

vilisto
einfach Wohlfühlklima

NosoEx[®]
powered by GWA Hygiene

Transformation of University Program

Image: HS Karlsruhe

- Integration of startup programs in university's curricula
- Startup activities substitutes courses credits

Transfer through Research & Innovation Projects

A hand is shown from the bottom left, palm up, holding a glowing, translucent digital globe. The globe is covered in various icons representing technology, communication, and global networks. The background is a dark blue field filled with intricate, glowing circuit board patterns and small, scattered light points.

The Transformation during the Pandemic Year

E-Learning for School Education in Germany

Ranking E-Learning Index

Quelle: Center for European Policy Studies, 2019

Lernmethoden: Schüler in Deutschland bevorzugen Videos

So viel Prozent der befragten Schüler finden diese Lernmethode am besten

Befragung von 2.208 Schülern im Alter von 14 bis 21 Jahren im Jahr 2019

Quelle: IW JUNIOR
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iwd

The Impacts of COVID-19 on Higher Education in Germany

- Physical distancing: requires a large space
- Teaching and learning activities should be transformed online in a short time
- Government grants for universities to transform. Bremen: 4 million euros, Nordrhein Westfalen: 20 million euros
- Higher education initiatives: <https://hochschulforumdigitalisierung.de/>

Image: KIT

Technology and Organizational Solutions

- Establishment of a digital transformation task force, consisting of students, lecturers, IT staff, and admin staff.
- Standardization of software use and internal support:
 - Webinars / online lectures: Zoom and Microsoft Team
 - Online exams: LPLUS and Pruefster
 - Learning management system: moodle
 - Gamification: kahoot, mentimeter, specific field tool
- Training and knowledge base
- Regulations for information security
- Strategies for effective communication

Didactics in Online Learning

- Ensuring technical equipment is functioning properly
- Set the rules of the game in advance
- Periodic checks on the effectiveness of the teaching and learning process
- Diversify teaching modes, change modes every 20 minutes
- Allocating extra time outside the teaching schedule for students
- Apply the blended / hybrid learning method

Image: Jacobs University

Image: Jacobs University

Lecturers are Sources of Inspiration

- Provide a structure of thinking, contents can be obtained from anywhere
 - Stimulate students to learn more than the material presented
 - Explain real problems that can be solved by the material being taught
 - Describe a real application
- Deliver why it is important to study the material presented so that students choose a career path that has something to do with the material presented

Image: Jacobs University

Learning in Digital Era

Conventional learning

Modern learning

The Roles of Digital Technologies

Digital technology does not replace the role of lecturers, but improves the **experiences** of the learning process

Behaviorism

- Online quizzes
- Gamification
- VR

Cognitivism

- Presentation of materials
- Tools for understanding teaching materials: books, textbooks, slides
- Combination of different material formats

Constructivism

- Mindmap: provides a structure of thought
- Material context: daily experiences, actual problems
- Project implementation and group work
- Flipped classroom

Another Strategy in the Use of Digital Technology

Classroom
Face to Face

Online
E-Learning

Hybrid Classroom

Hybrid Classroom Kit

Gambar: Amazon

Digital Transformation in Project Implementation

- Video conferencing platforms, e.g. MS Teams, Skype business, etc.
- Project management tool, e.g. JIRA, trello, Wekan
- Knowledge management tool, e.g. Confluence, Wiki
- Shared repository, e.g. NextCloud, Google Drive, sharepoints, etc.
- Collaborative document editing, online Office, Google docs, Overleaf.

**Never stop
learning,
because life
never stops
teaching**

Mu'uminina Sadiqina

theviennablog.com

إِنَّ مَعَ الْعُسْرِ يُسْرًا

*verily,
with every hardship comes ease! -
(94:6)*

لَا يُكَلِّفُ اللَّهُ نَفْسًا إِلَّا وُسْعَهَا

ALLAH DOES NOT BURDEN A SOUL BEYOND THAT IT CAN BEAR

Surah Baqarah | Verse 286

LY Creations

Conclusions

- Good teachers cannot be replaced by technologies
- Focus on learning objectives, not the technology used
- Technology is intended to improve the learning experience
- Technology develops in a direction that is easy to operate, lecturers and students must remain focused on the learning goals

Thank You

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