Revisiting the three roles of higher education during the pandemic year

An Experience in Germany

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Contents

Higher Education in Germany

University vs. University of Applied Sciences

University

- Offer almost all study programs
- Offer PhD programs
- Focuses on research, theories, and sciences
- Learning in large classes
- Minimum student supervision
- Professors have experiences in research

University of Applied Sciences

- Do not offer medicine, teacher education, kedokteran, law, and natural sciences
- No PhD programs, except in cooperation with universities
- Focuses on the applications of sciences
- Learning in smaller classes
- Intensive student supervision
- Professors have experiences in industry

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

Sumber: US Department of Defense

The Roles in Education

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

The Roles in Research

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

Career Path of Professor and the Synergy with the Organization Structure

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 (1,5) (1,5)							x	21
	a) Structure (Design) b) Train of thought (Central theme/ conclusiveness)													
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%

The Roles in Transfers

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

PHYSEC
security for things

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 Projects

Transfer through Innovation and Action Projects

- The aim is to disseminate and exploit project results funded by public institutions to ensure the outreach
- No research contents
- Typical activities in the projects
 - Workshops and seminars
 - Conferences and exhibitions
 - Portal or platform development
 - Development of standardizations and work groups
 - Development of reference process or architectures

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 connectivity. 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

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.

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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