A COMPETENCE FRAMEWORK FOR DATA & DIGITAL LITERACY EDUCATION AT LEUPHANA

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→ DigiTaL & UDLE

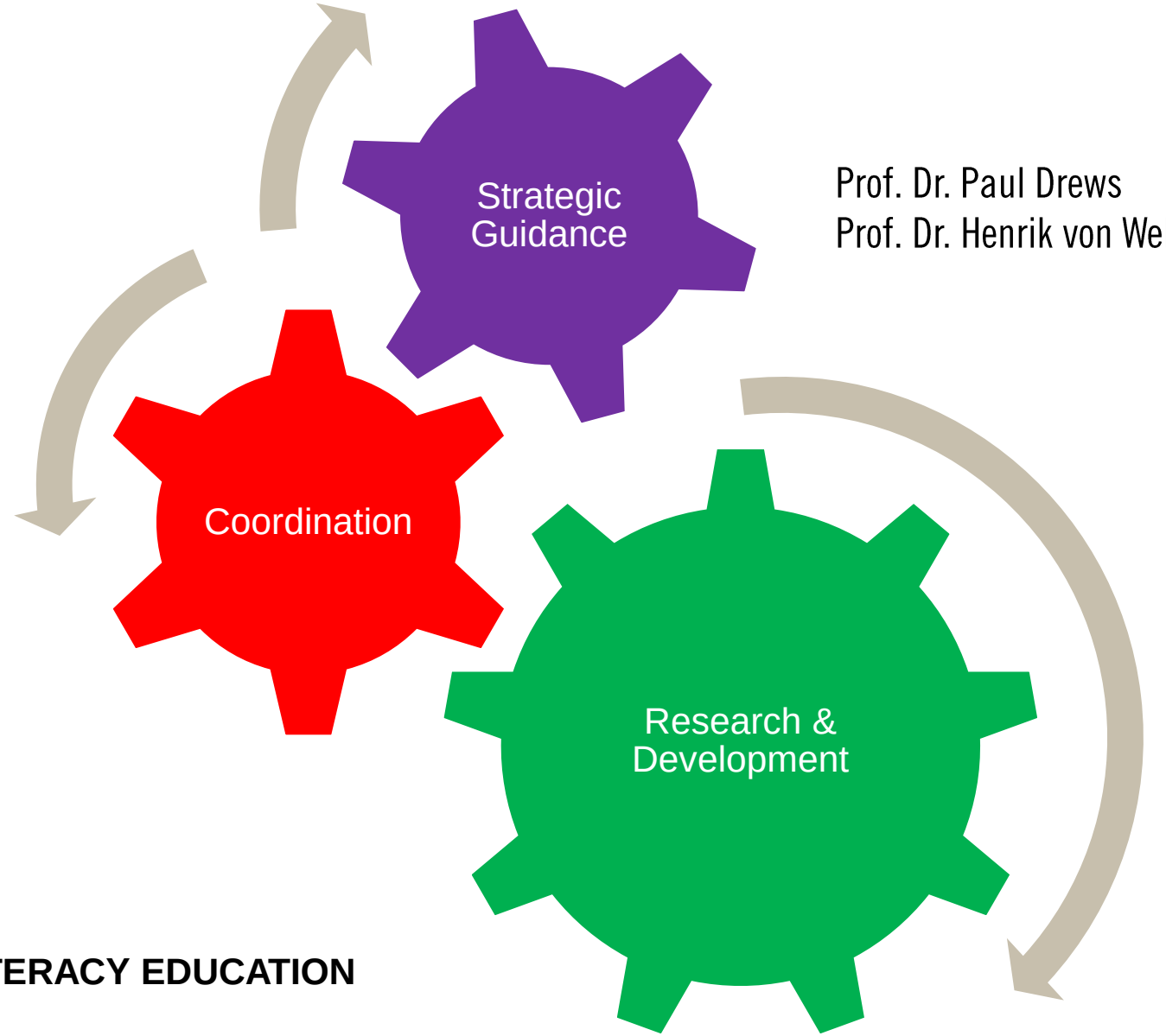
LEUPHANA
UNIVERSITÄT LÜNEBURG

Up to 80% of some many occupations (e.g., in banking and the creative industry) will become automatized in the next years.*

*Check yourself at https://job-futuromat.iab.de/

“If we teach today‘s students as we did yesterday‘s, we are robbing them of tomorrow.“
John Dewey

CLUSTER DATA & DIGITAL LITERACY EDUCATION
(DIGITAL-PROJECT + UDLE-PROJECT)



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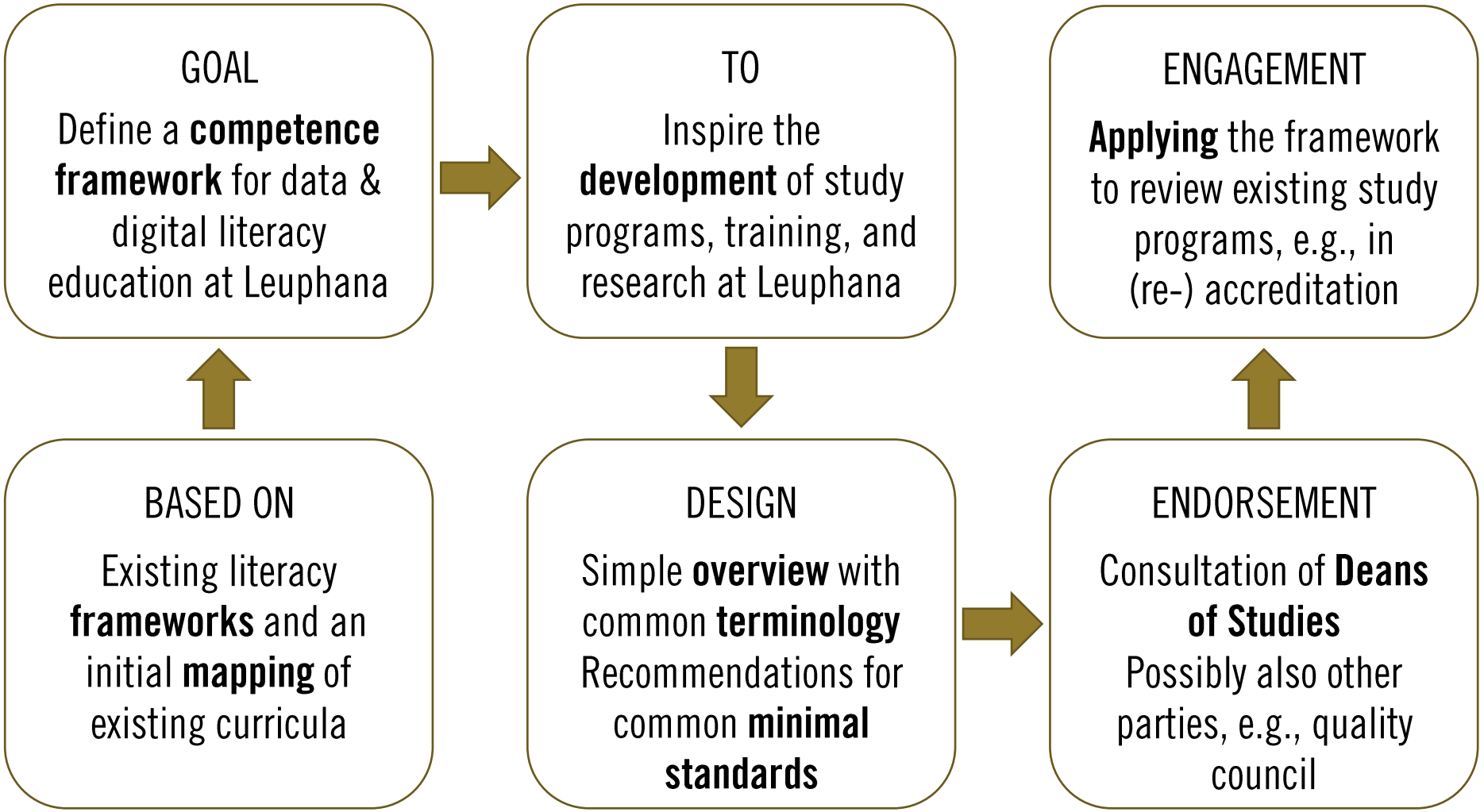
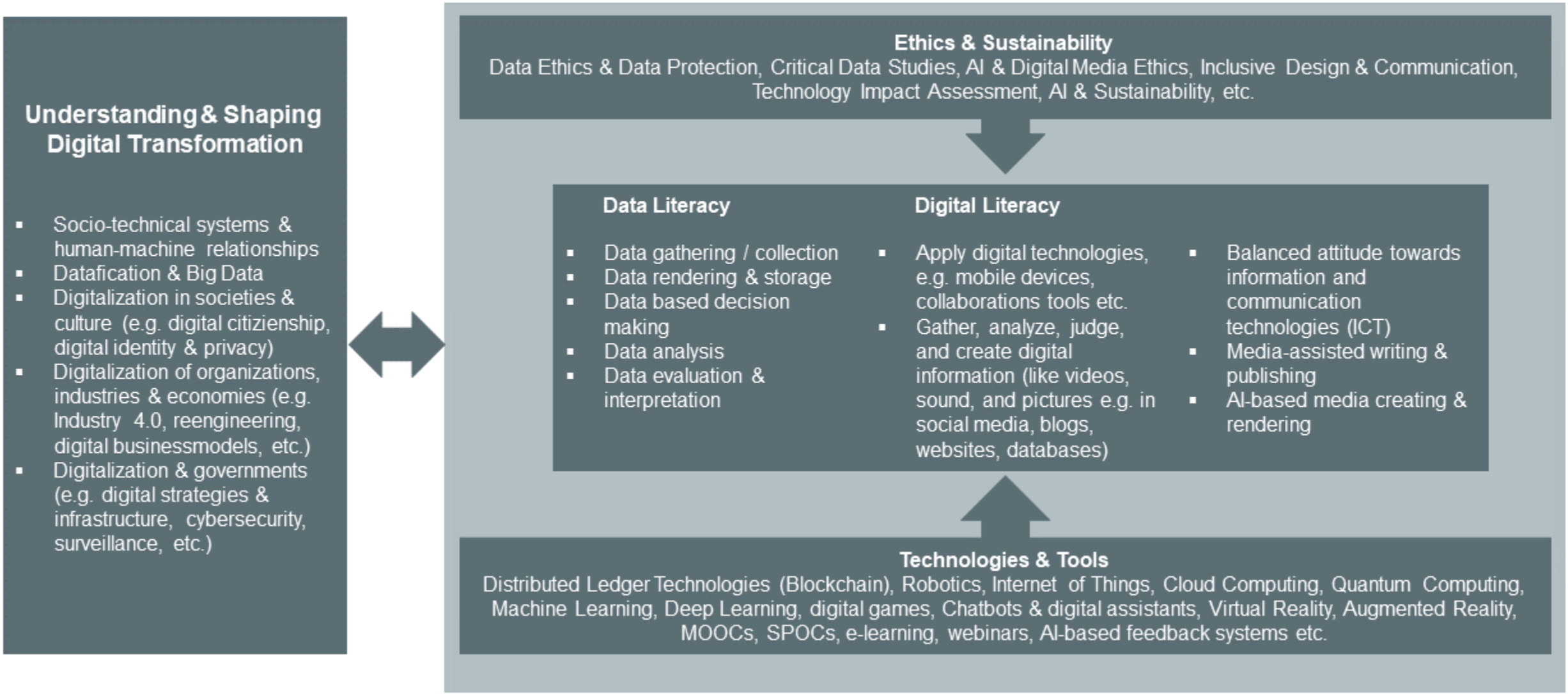
CLUSTER DATA & DIGITAL LITERACY EDUCATION (DLC)



OVERVIEW DATA & DIGITAL LITERACY EDUCATION



MATRIX CURRICULUM DEVELOPMENT DATA LITERACY EDUCATION

Interdisciplinary fields			Subject-related fields – Example Leuphana Semester	
General competence framework	Educational goals of the Leuphana study model	Data & AI Literacy	Curricular implementation	Communication / Addressing students
Professional competencies & interdisciplinary knowledge	▪ expertise ▪ extensive, multidisciplinary knowledge related to the major challenges of the day and current issues facing society (see U.N. Sustainable Development Goals)	▪ Data Analysis & Statistics Theory ▪ Contextuality of data ▪ AI-related mathematical models ▪ Programming languages & databases ▪ Functionality of algorithms & Big Data (e.g. machine learning, neural networks, deep learning) ▪ Legal basis, basic data protection regulation ▪ Sustainability and digitalization (data sufficiency, resource consumption, exploitation of global south)	▪ Lectures, including Flipped Classroom ▪ Programming exercises	▪ All students: Understanding & knowledge of new, digital technologies is central to the ability to make judgments and decisions in a digital-driven society ▪ Computer Science Students: Professional ethics & professional actions impact society, understanding what responsible action means ▪ Student teachers: are future multipliers ("teachepreneurs") of the digital transformation and thus bear great responsibility for society ▪ Sustainability students: Critical evaluation of data is central normative knowledge towards a sustainable transformation ▪ …
Methodological competencies	▪ Analytical skills ▪ Critical and creative thinking ▪ Understand and be able to apply scientific methods	▪ Coding of data & decoding of data ▪ gather, store & prepare data (e.g. visualize graphically) ▪ applying statistical methods ▪ Interpretation of data-based information ▪ Derive trends & data patterns for strategic decision-making	▪ Lectures ▪ Project work ▪ Seminars ▪ Tutoring	
Personal & social competencies	▪ Intellectual and practical skills ▪ Communication team skills ▪ Willingness to take personal and social responsibility ▪ Willingness to engage in civic activities ▪ Intercultural skills ▪ Ethical and value-based thinking and acting	▪ Being able to communicate the significance of data / information ▪ Awareness of manipulative representation using processed data ▪ Understand the impact of "teaching" AI with insufficient data (e.g., discrimination, incorrect judgments & actions) ▪ Knowledge of Critical Data Studies & Data Power (e.g., local invisibles, discrimination, unequal access to network infrastructure) ▪ Understand how data positivism, AI & algorithms impact perceptions, decisions & justifications ▪ Understanding ethics & values in dealing with data & AI (ethical schools of thought and their consequences for action, ethical concepts of authorship and perpetration, responsibility, and human-machine relationship issues) ▪ How Big Data, AI & Algorithms Can Contribute to Human Wellbeing	▪ Project work ▪ Conference week ▪ Facilitation in seminars	
Professional and civic action, decision-making & learning skills	▪ Be able to apply professional knowledge ▪ Confidence in making decisions in complex situations ▪ Application-oriented learning that can be applied across disciplines & trans- or post-disciplines to new situations and complex problems ▪ Ability and willingness to engage in lifelong learning	▪ Understand cross-disciplinary concepts on AI & Big Data and be able to assess their opportunities, limitations and risks	▪ Project work ▪ Conference week	

LEADING QUESTIONS FOR CURRICULUM DEVELOPMENT

1. Where do students learn to **gather, render, protect, and store data** in a responsible manner?

2. Where do students learn to **analyze, visualize, evaluate, and interpret data** in a responsible manner?

3. Where do students learn to **code and render programs** for automated information-processing, decision-making, and process execution in a responsible manner?

5. Where do students learn how to use software for **writing, literature search, and publishing** in a responsible manner?

6. Where do students learn how to **communicate, collaborate, teach, and lead** with the help of digital media in a responsible manner?

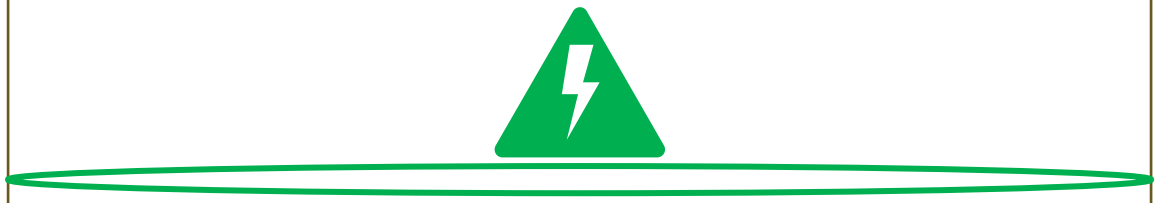
7. Where do students learn how to **produce, render, and analyze audio-/visual information** with the help of digital technologies in a responsible manner?

4. Where do students learn how to **apply, evaluate, and design AI-based solutions**, and to understand the opportunities and risks of artificial intelligence?

FUTURE ACTIVITIES

MAPPING

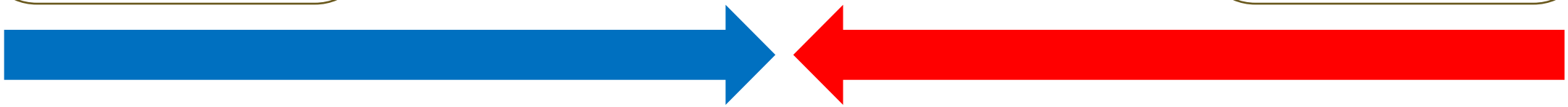
The principal goal of the mapping exercise is to make the **status quo** transparent.



CREATIVE TENSION

COMPETENCE FRAMEWORK

The principal goal of the competence framework is to provide a **vision** that we can aspire to as a university.

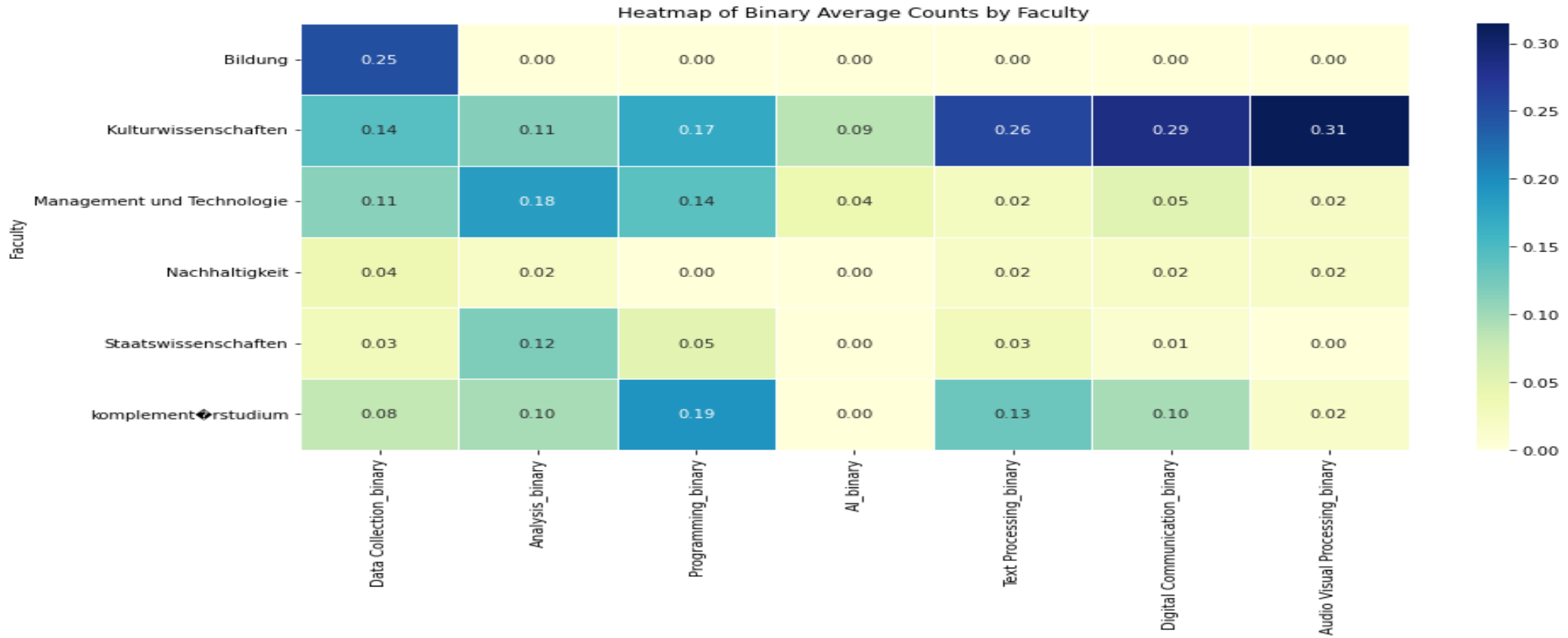


- Shows, what **expertise** is already available and showcases good course examples
- Highlights **room for improvement** at diverse levels: Faculties, degree programs, courses

- Formulates **areas of digital / data competence** that need to be considered
- Basis for formulation of **new curricular standards**, e.g., of degree programs

DIFFERENCES BETWEEN FACULTIES (DRAFT)

Percentage of courses at a Faculty that cover relevant contents.
Example: 25% (0.25) of the courses at the Faculty of Education (“Bildung”) cover “data collection” (at least 1 keyword from the cluster found).



CONTACT INFORMATION

The DLC is a cooperative of the projects „Umfassende Data Literacy Education“ – UDLE (2022-2023) & „Digital Transformation Lab for Teaching and Learning” – DigiTaL (2021-2024), both of which are funded through the Stiftung Innovation in der Hochschullehre

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