The challenge of scale: achieving critical mass in application-oriented research environments

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Contributors

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Michael Gille is a full professor in law at HAW Hamburg, Germany. He has led HAW Hamburg´s Graduate Centre (‘Promotionszentrum’) 2014-2025. In this capacity, he supported the establishment of cooperative doctorates with German and international universities and has been instrumental to the HAW Hamburg’ s preparation to obtain the right to autonomously grant doctorates in 2025.

Outline

Notions of 'critical mass' in research

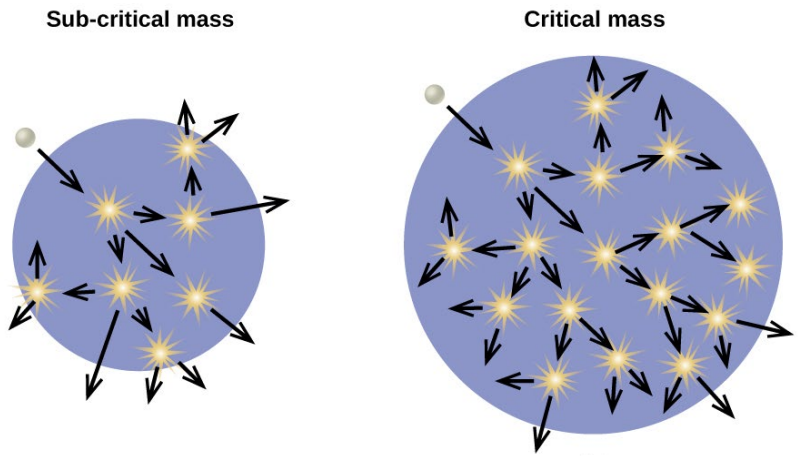
Evaluative practice drawing on 'critical mass' of research environments

Characteristics and challenges of application-oriented research environments for building 'critical mass'

Outlook

Salzburg principle 6: Achieving 'critical mass'

„Doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practice being introduced in universities across Europe, bearing in mind that different solutions may be appropriate to different contexts and in particular across larger and smaller European countries. These range from graduate schools in major universities to international, national and regional collaboration between universities.“ (EUA, 2005)



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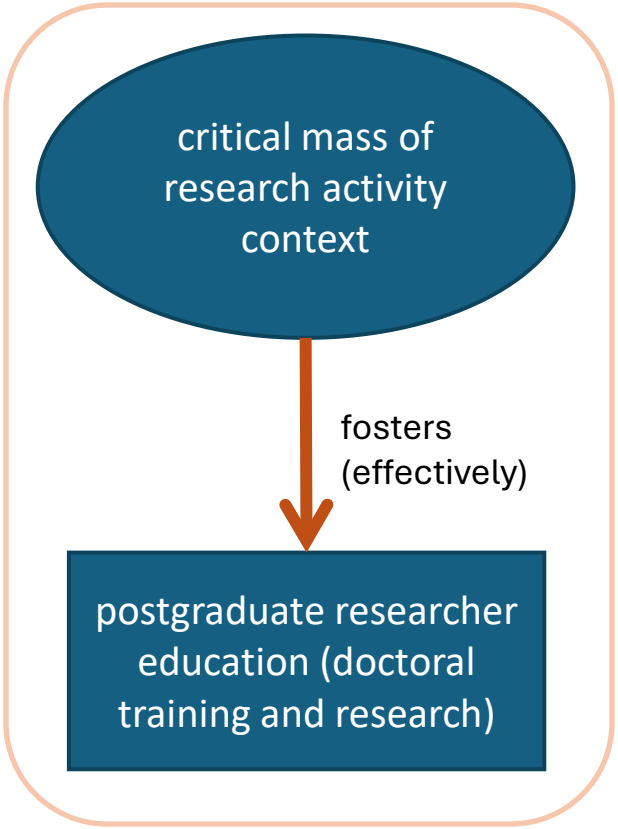
Critical diversity of research

*„**Critical mass and critical diversity***

*Doctoral education is dependent on the research environment. Institutions must develop **a critical mass and diversity of research** in order to offer high quality doctoral education. Critical mass does not necessarily mean a large number of researchers, but rather the quality of the research.“* (EUA, 2010)

From 'critical mass' to critical masses



- Quantity drives quality, but upper critical mass is limit [1]
- Central driver: interactions/communication between individual researchers within group [2, 3]
- Broad variety of indicators and weighting approaches [4, 5]
- Threshold group size(s) for different purposes, e.g.,
  - policy and managerial conclusions (funding, effective progress of research)
  - assess quality of 'production' of research output at institutional, department or research group level

Towards a sustained and productive research environment

- Critical mass is no exhaustive universal concept
- Stable inter-generational transmission of scientific knowledge, skills, habitus and practice important for 'cascading' and 'reproductive pedagogic continuity‘ [6]
- Different disciplines (e.g., laboratory vs. non-laboratory): different critical masses
- Application-oriented research shows deviating patterns [7]

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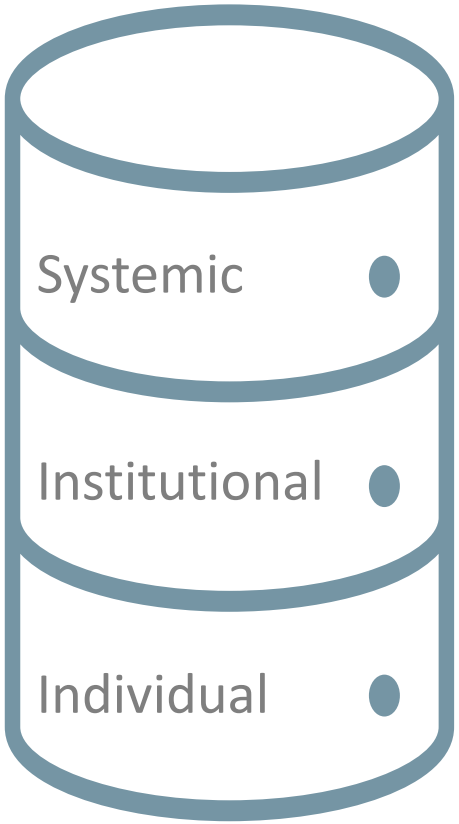
Characteristics and critical mass requirements for UAS in Germany



→Role in binary HES

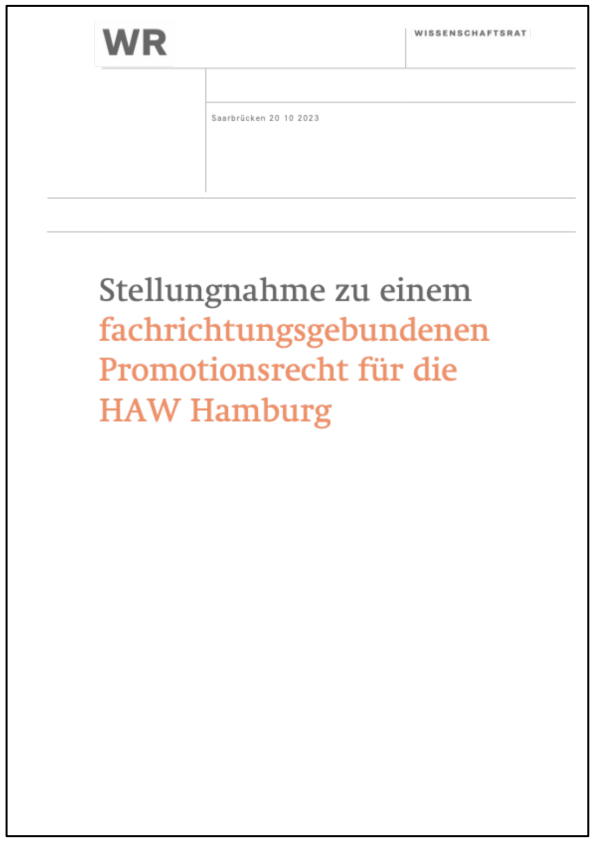
→Applied research environment: interdisciplinary and collaborative

→**Institutional critical mass requirements**

→Programme-level autonomy

→Individual threshold criteria

Definitions diverge and serve different evaluative purposes


WR

WISSENSCHAFTSRAT

Saarbrücken 20.10.2023

Stellungnahme zu einem fachrichtungsgebundenen Promotionsrecht für die HAW Hamburg

"A research environment is formed by a critical mass of professorial members who are able to assess scientific quality from a disciplinary point of view and who may also be prepared to conduct multi- and interdisciplinary research. Each research environment is also formed by staff with doctorates and doctoral students." (WR, 2023a)

Dimensions of critical mass for UAS in Germany

Programme-level: one or more HE institutions must provide

- definition/delineation of **domain**
- **head-count** (statutory threshold: 6, 10, 12, 14 professors)

Individual-level: programme-constituting professors are active researchers exhibiting research track during previous five years

- **publications** (peer reviewed and non-peer reviewed)
- competitive **funding** (50k/100k p.a.)
- (experience in doctoral supervision)
- **fit** into the domain

Conceptualisation of the 'applied' doctorate at German UAS*

Same title(s)

Applied/practice-based vs. non-applied/basic research dichotomy

Practice-oriented research means 'appliedness' of **research perspectives:** same and equivalent to research universities, but different perspectives

Non-monodisciplinary

Curricular component integral element

* WR, 2022a, 2023a, 2023b

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Collaborative research environment(s) and 'critical mass'

- Extramural, i.e.
  - other universities
  - research institutions
  - industry and non-industry partners
- Different communication and interaction patterns
- Challenge to stability and continuity
- Scolarly impact vs. real-world impact

... applied (research, science)

... application-based

... application oriented

... application-related

... practice-based

... practice-oriented

... use-applied

... interventionist

... transformative

Interdisciplinary research environment(s) and 'critical mass'

- Applied research usually involves two or more disciplines challenging coherence [7]
- Often relatively isolated topics with strong links to several disciplines – different academic transmission
- Same quantity needed for saturation of communi-cation links to increase quality?
- Same balance between research project and generic research training?
- Relevance of academisation of disciplines?

... applied (research, science)

... application-based

... application oriented

... application-related

... practice-based

... practice-oriented

... use-applied

... interventionist

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Is there something in it for a Salzburg III?

- There are even more dimensions to critical mass
- Shift of perspective to collaborative and non-monodisciplinary research environment
- Relevant input from the Coalition for Advancing Research Assessment (CoARA)
- Include HES permeability demands that come with binary HE systems (e.g. Portugal, the Netherlands, Austria, Switzerland…)
- More research into critical mass is needed!

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Back-up slides

Individual quality indicators and intersectoral collaboration

„Institutions must be able to develop their systems for quality assurance and enhancement independently within their national frameworks. They must have the ***freedom to develop their own indicators for quality*** *that correspond with the standards of the individual disciplines as well as with the overall institutional strategy.“ (EUA, 2010)*

„Intersectoral collaboration. *All stakeholders should engage in* ***measures to facilitate co-operation between providers of doctoral education and the non-academic sectors to the mutual benefit of all partners.*** *It is essential to* ***create awareness about the qualities of doctorate holders*** *as well as* ***to build trust between universities and other sectors.*** *Such* ***trust is, for example, built on formalised but flexible research and research training collaboration between industry and higher education institutions,*** *including joint research projects, industrial doctorates or similar schemes.“ (EUA, 2010)*

Learning outcomes in the European Qualification Framework (level 8)

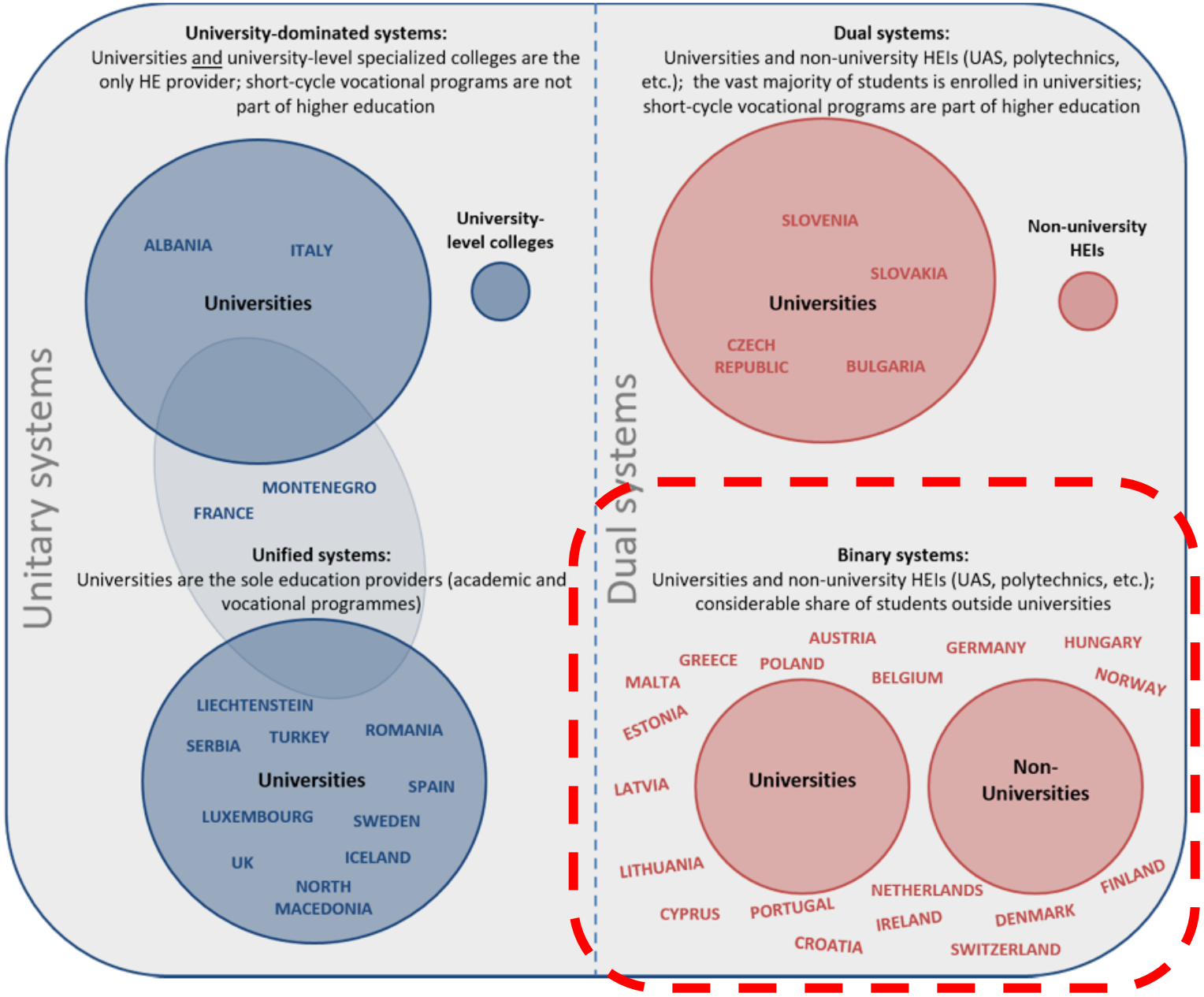
Knowledge	**Skills**	**Responsibility and autonomy**
Knowledge at the **most advanced frontier of a field of work or study** and at the interface between fields	The most advanced and specialised skills and techniques, including synthesis and evaluation, required to **solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice**	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the **forefront of work or study contexts including research**

Implementation Models

Model	Implemented in the federal states (Länder)
“Central" model (umbrella structure for 20+ UASs)	North Rhine-Westphalia, Baden-Württemberg
“Decentral" model for defined domains (involving one or more UAS)	Hesse, Saxony-Anhalt, Bavaria, Berlin, Bremen, Brandenburg, Rhineland-Palatinate, Thuringia, Saarland
One location model	Hamburg
Central cooperative model	Schleswig-Holstein

So far, the first three models have been evaluated.

Figure 1. Classification of national higher education systems



Source: ETER (2019), extension of the mapping provided by Kyvik (2004).