Ensuring good research practice in the time of Generative AI

A first exploration for policy development

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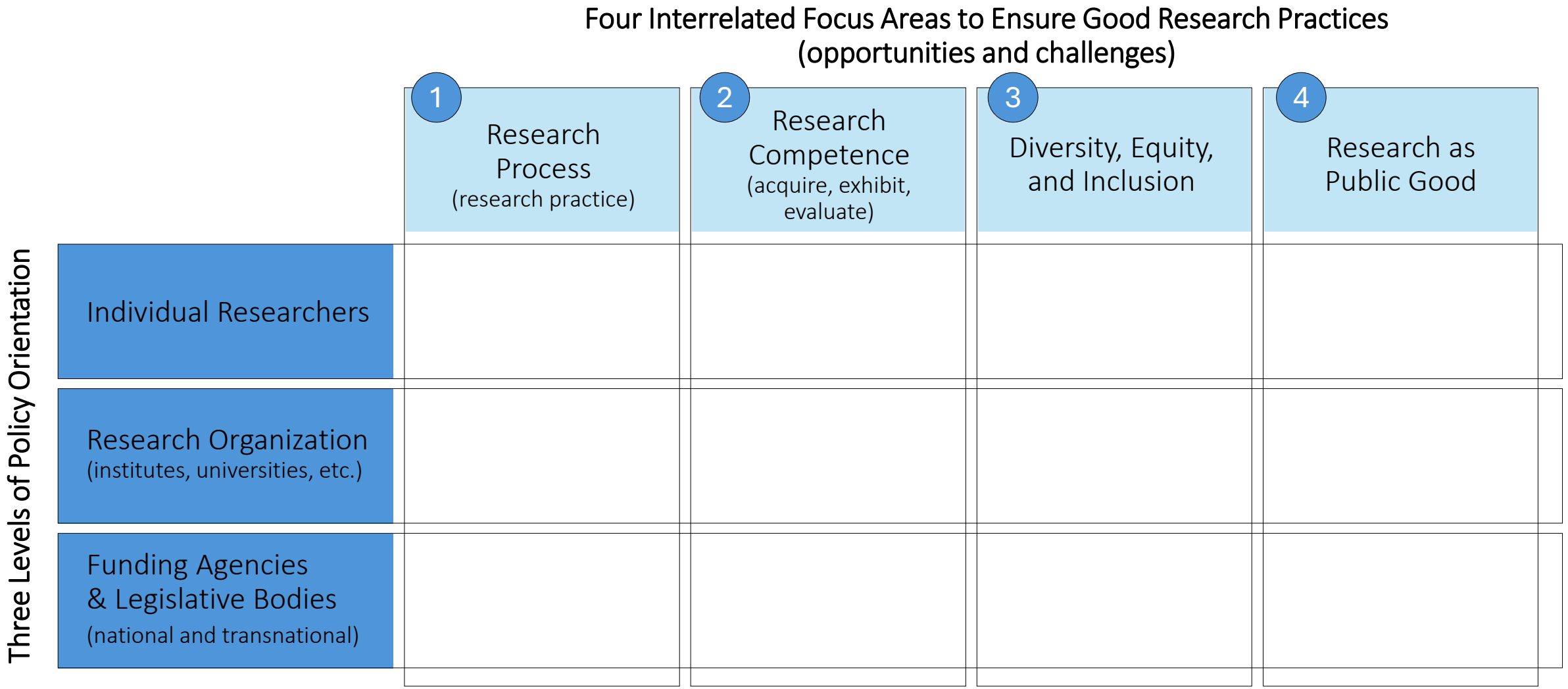
Presentation Goals

- Generative AI has fundamentally transformed the research landscape offering significant benefits combined with numerous challenges
  - **Obvious Benefits**:
    - ✓ Accelerated research processes (interrogation of extant knowledge, enhanced collaboration)
    - ✓ Improved writing and review/publication process
  - **Obvious challenges**:
    - ✓ Ethical concerns with respect to plagiarism and proprietary knowledge
    - ✓ Perpetuation of bias

- **Presentation goal**
  - Identify focus areas where 'naïve' exploration is valuable
  - Identify areas where policy is urgently required to ensure good research practices are sustained

Four Focus Areas – Three Policy Orientations



1 The Research Process

- Generative AI offers new opportunities and challenges in parts of the research process, such as:
  - Generation of ideas, literature overview, hypothesizing, data collection and analysis, programming, generating synthetic data, text, and images, dissemination of results and reviewing research applications

- **Where are we?**
  - Most work is currently happening in the 'research process' space
  - Need to increase focus in research policy oriented to:
    - ✓ Helping ensuring good research practices and research integrity (in the near term)
    - ✓ Making reliable generative AI-tools widely available and developing expertise to improve research efficacy (in the longer term)

The ***Research Process*** and the Individual Researcher

Demands from and needs of individual researchers include:

- Clarity about where and how generative AI can/cannot and should/should not be used
  Example of KU Leuven guidelines on '*using generative AI as a researcher*'
- Reflections on how new tools are integrated into disciplines and how that can be appropriately deployed
  - This analysis should parallel exploration of past tools applicability and cautions (open source, etc.)

- How do we facilitate this?
- Who does that for whom?
- How do we take care of the transition period?

The ***Research Process*** and the Research Organization

Demands from and needs of research organizations include:

- Helping researchers by familiarizing the use of generative AI in their specialty
- Articulating the dos and don’ts for researchers in their specialty
- Ensure national and transnational coordination about the use of generative AI
- Developing generative AI tools and expertise relevant for the specialty or research orientation

The ***Research Process*** and Funding Agencies & Legislative Bodies

Demands from and needs of funding agencies and legislative bodies include:

- Coordinating the role of generative AI in the review and selection process
- Coordination on the role of generative AI in the research agenda process
- Provide international guidelines about use
- Supporting and driving the development of transparent and accessible generative AI-tools and source materials

2 Research Competence

People acquire and demonstrate research skills in different ways
(theses, publications, policy papers, research project leadership, etc.)

- Research competence is concerned with:
  - Research skills (research management, thinking and working scientifically, academic attitude)
  - Discipline related skills (scientific knowledge, methodological knowledge)
  - Transferable skills (presenting, writing, working together, working independently)

- With the advent of generative AI, new forms of acquiring, exhibiting and evaluating competences:
  - need to be developed → the use of generative AI for these aspects
  - can be developed → generative AI as the means of making this possible

Research Competence and the Individual Researcher

Demands from and needs of the individual researcher include:

- Being coached on the wise use of generative AI to acquire new skills and knowledge
- Acquire appropriate skills that match the anticipated ‘field’ scientist of the future
- Exhibiting ‘future-proofed’ skills through the transformation of and amendment to existing output models
- Capacity to evaluate others use of generative AI

Research Competence and the Research Organization

Demands from and needs of the research organization include:

- Determining how young scientists sensibly acquire new skills and knowledge
- Determining new skills necessary to ‘future-proof’ scientists (broadly and within specific fields)
- Supporting the continued development of established scholars/scientists and supporting transformation
- Revising evaluation criteria needed for future scientific development

Research Competence and the Funding Agencies & Legislative Bodies

Demands from and needs of the funding agencies and legislative bodies include:

- using generative AI sensibly to evaluate research competence of researchers
  - With specific emphasis on research grant purpose
  - Evaluate whether generative AI is ‘correctly’ used in research applications

- Establishing and monitoring funding and grant application documentation
  - Appropriately embedding the use and implications of generative AI within the funding cycle

3 Diversity, Equity, and Inclusion

Generative AI offers opportunities and challenges for research practice
that is being questioned concerning diversity, equity, and inclusion.

- Amongst others, this concerns:
  - equal access to (equal) generative AI platforms for scientists across the globe,
    (including concerns related to financial and privacy implications)
  - Preserving and enlarging diversity of insights in research practice
    (including counteracting biased output resulting from bias in algorithms and source data)
  - Preserving and enlarging the degree in which scientists can participate in and progress research practice

- How can individual scientists, research organizations, and funding agencies & legislative bodies provide this?

4 Research as Public Good

"In its specific role as a global public good, science is a source of beneficial and applicable knowledge that is freely available and accessible worldwide, and where its use by anyone does not prevent or impede its use by others."

Boulton, G.S. 2021. Science as a Global Public Good. International Science Council Position Paper

- Generative AI-tools:
  - Largely offered by for-profit companies (often with minimal tax payments)
  - No/limited insight into algorithms, data usage, and longer-term intentions
  - Many providers outside of Europe, where rules regarding privacy, public good, intellectual property laws, and human rights are under a degree of pressure
  - Artificial Intelligence is being used to generate new Intellectual Property, without in itself having the intention to bring the goods in question on the market
    - ✓ This is occurring while some researchers are (inadvertently) handing over their creative ideas, data and (potentially) intellectual property by using current generative AI tools

Research as Public Good across the levels of Policy Orientation

Ensuring that science remains a public good given 'commercial' imperatives

- Providing individual researchers with sharpened advice on where and where not to use generative AI
- Great individual and collective voice from research organizations. Examples include academic cooperations such as SURF and GÉANT working on open-source Large Language Models (LLMs)
- (Trans)national funding agencies providing funds for building and maintaining open-source LLMs. (Trans)national legislative bodies can stimulate this through appropriate legislation

Generative AI needs to be a strength for science as a public good?

- How?
- What roles ***can and must*** individual researchers, research organizations, and funding agencies & legislative bodies play to achieve this goal?

To Conclude:

- **Focus on Opportunity**:
  - A primary focus on the potential that generative AI offers for science
- **Disruption bring progress**:
  - The rise of generative AI must be seem as comparable to the rise of the internet—surely disruptive, ultimately a driver of improved performance
- **Limited central (controlling) intervention**:
  - Only limited central policy is required if research organizations take up the challenges and opportunities proactively themselves
- **The private sector is here to stay**:
  - Public knowledge/research organizations cannot ignore the private sector so they must form mutually beneficial alliances