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More than just skills

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Salzburg #1

The core component of doctoral training is the advancement of knowledge through original research.

At the same time it is recognised that doctoral training must increasingly meet the needs of an employment market that is wider than academia.

The goal of doctoral education should be to foster a **research mindset** equipped with **advanced skills and knowledge**, enabling graduates to make a significant difference both within their academic field and in broader society through original and impactful contributions.





The goal of doctoral education



The goal is to train **doctoral researchers** to the highest skill levels to become **creative**, **responsible**, **critical and autonomous intellectual risk takers**.¹

The output is a **doctorate holder** who is able to **create an impact**, be it in the field or in society at large.

¹Maintaining a quality culture in doctoral education: At research-intensive universities, LERU Policy Paper (2016) <u>https://www.leru.org/publications/maintaining-a-quality-culture-in-doctoral-education-at-research-intensive-universities</u>



We have invested in...

- Structuring doctoral programmes
- Transparent procedures
- Professional support structures
- Quality assurance measures
- Competence frameworks
- Trainings in transferable skills



- Creativity
- Critical thinking
- Autonomy
- Risk taking
- Innovation
- Responsible conduct of research





The mismatch remains, e.g. team-work

Year (published)	Geography / sample	How "team-work" was shown to be lacking	Key take-away
2011, De Grande et al.	835 Flemish PhD candidates vs. 217 R&D-active employers (Belgium)	Employers ranked "able to work as part of a team" = 64.5 % , making it their #2 skill , whereas only 38 % of doctoral candidates thought it mattered; authors label this a "clear mismatch".	Team-work valued far more by industry than by PhD candidates themselves.
2012 – OECD "Transferable Skills Training for Researchers"	Policy scan of 23 OECD countries	Executive Summary lists <i>team-working and networking</i> alongside communication and business know-how as skills researchers increasingly need but often lack. (<u>OECD</u>)	Multinational consensus that formal provision for team-working is patchy.
2018 – U.S. National Academies, "Graduate STEM Education for the 21st Century"	Dozens of employer focus groups + literature review	Employers reported that many new PhDs "struggle with working effectively in teams with members from different cultural or disciplinary backgrounds". (<u>The National Academies Press</u>)	Team-work deficit persists even after technical preparation.
2021 – Leiden Madtrics survey of 2 193 Dutch PhD alumni	Graduates 2-6 yrs post-PhD across all sectors	Among 13 skills, the <i>largest negative gap</i> (needed minus developed) was for team-work , social skills and project management. (<u>leidenmadtrics.nl</u>)	Even recent European programmes still under-deliver on collaborative abilities.
2024 – DocTalent4EU "Report on current & future transversal skills needs"	EU-wide mining of 20 000 job ads + employer questionnaires	Highlights " Collaboration in teams and networks " as one of the employer-demanded skills least systematically taught in doctoral programmes. (<u>DocTalent4EU</u>)	Latest audit shows team-work demand climbing faster than training supply.





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https://www.leidenmadtrics.nl/articles/skillgaps-of-phd-graduates







Do we fail? ... and why the mismatch persists

- ... team-work is not part of our culture and reward system
- Hidden curriculum: Supervisors signal "lone-scholar excellence."
- Structure: skills courses are of little use if they are not integrated into research practice.
- Assessment inertia: Doctorate still judged primarily on individual thesis and papers.
- Funding logic: Grants still list one PI; limited incentives for co-creation.
- Fragmented data: QA focuses on completion times/output counts, rarely behavioural outcomes.



Future of Jobs Report

- Most sought after
 - analytical thinking
 - resilience, flexibility and agility
 - leadership and social influence
- Fastest-growing
 - Al and big data
 - networks, cybersecurity and technology literacy
 - creative thinking, along with curiosity and lifelong learning









What does that mean for doctoral education?





What does that mean for doctoral education?

- As AI is transforming the world (of work), including academia, doctoral candidates must be able to engage with AI critically and its impact.
- A solid research mindset in doctoral education requires in-depth knowledge and an openness to interdisciplinary perspectives.
- Transformative researchers develop through deep vertical knowledge and broad horizontal awareness.
- The relevance and impact of research should be given more attention.
- Support the path from knowledge creation to making change.





Recommendations

- Measure what matters to you, e.g., include collaboration metrics in QA dashboards.
- Priority skills should be integrated into research tasks rather than workshops.
- Turn from being a provider of skills courses to a curator of ecosystems.
- Promote AI literacy, from tool use to critical engagement and ethical reflection.
- Equip PhD students with systems thinking and future-proof skills.



Call to action

Anchor doctoral education firmly in rigorous, curiosity-driven research and intellectual autonomy — and, at the same time, redesign its ecosystem so every candidate routinely collaborates across disciplines, thinks in future scenarios, critically engages with AI, and is prepared to co-create impact with society.

My question to you: Which new literacy (systems, futures, AI, collaboration) is the toughest to integrate in your context?



DNA of Doctoral Education



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Thanks for listening.

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