

Code competencies for better science:

Recommendations for the German academic system

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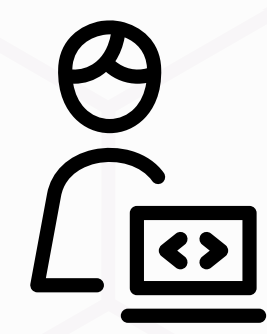
Software competencies - as a user, developer, or proponent - become indispensable in today's digital scientific conduct. Yet, these competencies are not universally fostered in the German academic system. In a workshop hosted by the Volkswagen Stiftung in November 2024, 33 participants from different scientific fields and positions developed actionable recommendations for different target groups in or around academia to improve digital competency in science.

Full paper: doi.org/10.5281/zenodo.14273366

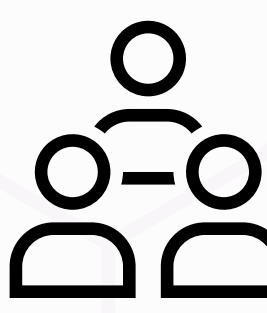
Read the white paper:



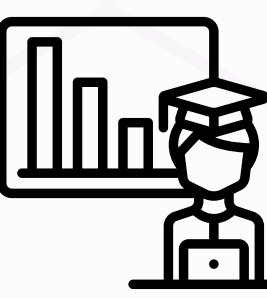
Target groups



RSEs and their networks
Individual software developers, RSE "Champions", or local RSE networks. Can act meaningfully in their immediate surroundings and communicate needs to higher levels.



Associations and interest groups
e.g., ReSA, deRSE, GI. Can identify and combine RSE interests across institutions and represent RSE interests nationally or internationally.



Teaching staff
Lecturers. Can demonstrate and teach research software to the next generation of scientists.



Academic leaders
PIs and other project or group leads. Can foster digital competency in their staff e.g., with work culture, demands or incentives, and "lobby upwards".



Institutional heads
Management level of institutions. Little impact on daily science, but substantial leverage through regulations and guidelines.



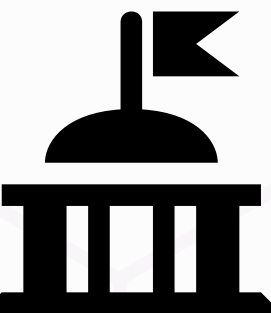
Local academic infrastructure
Services like course-coordination, PR, data stewards, open science offices. Can offer support structures across institute-boundaries.



Major infrastructure providers
Libraries or computing centers. Can offer support structures across fields and create networks across services.



Funding bodies
Funders of any kind. Can directly influence scientific profiles via funding priorities and review criteria.



Policy makers
Science policy. Can provide long-term improvements, e.g., regarding employment conditions, to foster digital competency.



Providing learning opportunities

Teach Open Science!

Recommend digital tools for self-study to students

Use open educational resources (OER)

Educate yourselves

Create formats for learners without a local community

Be a mentor

Include digital skills early in curricula

Make courses on digital competencies visible

Make use of your networks

Lower the threshold to attend

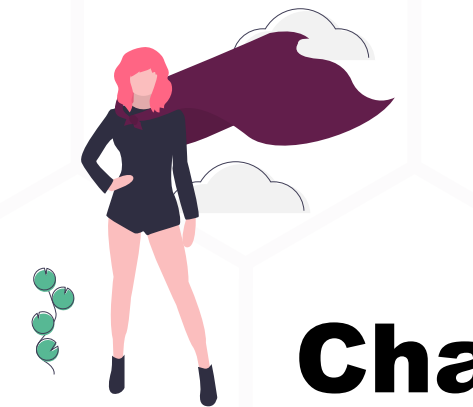
Educate yourselves

Teach advanced skills, too

Require open availability of educational resources

Assess & communicate Needs

Retain and train teaching talent



Champions

- Scientists; domain experts within their field
- Support RSE topics as role model/ambassador and advocate within the system
- Work as RSE or close to RSEs
- Examples: Professors, Data/Software Stewards, individual scientists,... with strong connections to RSE topics

Multiplicators

- Central & first contact within RSE networks
- Identify and boost relevant topics
- Spread knowledge
- Foster interdisciplinary interactions and networks
- Make research software more visible
- individuals but also groups/initiatives/associations
- social > technical skills

Ease entry into existing communities

Find and tell RSE stories

Do RSE things and talk about them

Create central resources

Connect yourself and your staff

Help RSE stories get more reach

Finance RSE PR

Identify, support and connect multiplicators and champions

Create entry points

Fostering the RSE Community



Establishing frameworks & incentives

Demand local software guidelines

Value digital competencies

Create a culture of constructive criticism

Be aware of resource needs

promote and require skill building

Lobby for RSE

On- and off-board with RSE in mind

Allocate resources for digital skills

Ensure digital competence in review panels

Create Career Paths

Increase subjective attractiveness

Increase objective attractiveness

Use RSE KPIs

Develop, implement, & share policies

Create support for software policies