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Empfehlungen und Erfahrungsberichte für die Praxis von Forschungsdatenmanager*innen

Shaping User Personas for NFDI Section Training & Education and DALIAⁱ

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Abstract

The National Research Data Infrastructure (NFDI) section Training & Education (EduTrain) aims to support and coordinate NFDI e.V.-wide educational activities that promote awareness of the significance of research data management (RDM), data literacy, and impart knowledge and skills in data science. One of EduTrain's foundational projects is the Data Literacy Alliance (DALIA), which promotes the guiding principle of "data literacy from the very beginning" through a platform that enhances teaching and learning with curated educational resources. This ensures that educational materials are easy to find, readily accessible, and as interoperable and reusable as possible. The target groups of EduTrain and its aggregator platform DALIA are diverse – not only in terms of discipline, professional or educational status, but also with regard to their level of RDM competence. The development of personas is a common method for comprehensively describing representatives of user groups in order to enhance user-centered development processes. This paper presents the development process and the core personas developed. These personas serve as a framework for user-centered development within NFDI training infrastructures and provide a foundation for future persona-driven educational design.

1 Introduction

Personas provide a structured way to understand target groups, make them tangible for development teams, and support user-centred design. To avoid duplication and ensure harmonisation, personas for potential DALIA users were jointly developed by EduTrain's work package 1 (AP1) and the DALIA team. A co-design approach involved members of NFDI and other stakeholders. The resulting personas mark an initial step towards guiding the development of DALIA and similar infrastructures such as ELIXIR and EOSC ("RDMkit", [n.d.](#)).

2 Personas – a method of user group description

In the dynamic field of digital product design and development, understanding user needs, preferences, and behaviors is essential. User-centered design requires a tailored approach. The persona method has gained popularity for this purpose. It involves developing realistic, fictitious user profiles which condense and represent a target group as a single individual, helping designers to align products with specific user expectations (cf. Blomkvist, [2002](#); Pruitt & Grudin, [2003](#)). Personas foster a shared understanding of users, improve team communication, serve as a basis for use cases and user stories, and can support collaboration with external partners (cf. AlSabban et al., [2020](#)).

The method was introduced by Alan Cooper (1999) and since then has been widely adopted across many domains such as product design and marketing (cf. Salminen et al., 2022) but also healthcare (cf. Guan et al., 2021), social media community management (cf. Gaiser et al., 2006), pedagogy (cf. Thomas, 2022) or higher education (cf. Albrechtsen et al., 2016; Lepzien & Lewerenz, 2017).

Typically, personas are developed based on qualitative or quantitative data, with or without community input. The process usually includes data collection, analysis, persona creation, and validation, and can follow mixed methods (cf. Jain et al., 2019; Jansen et al., 2020; Lepzien & Lewerenz, 2017). As both users and services evolve, personas are not static but should be regularly reviewed and updated to remain relevant (cf. Lepzien & Lewerenz, 2017).

3 Development process

To avoid stereotypes from a small internal team and better reflect the wider NFDI community, we used a co-design approach that directly involved stakeholders. Such participatory methods help ensure that personas are grounded and representative and may lead to more engagement with what is supposed to be developed (cf. Albrechtsen et al., 2016).

The development process presented here included the following steps:

1. Survey and analysis of existing user descriptions within NFDI consortia.
2. Template and workshop material development.
3. Co-design workshops using focus groups.
4. Consolidation of workshop results into persona descriptions.
5. Transfer of personas into use cases and user stories for DALIA.

The entire process is outlined in [Figure 1](#).

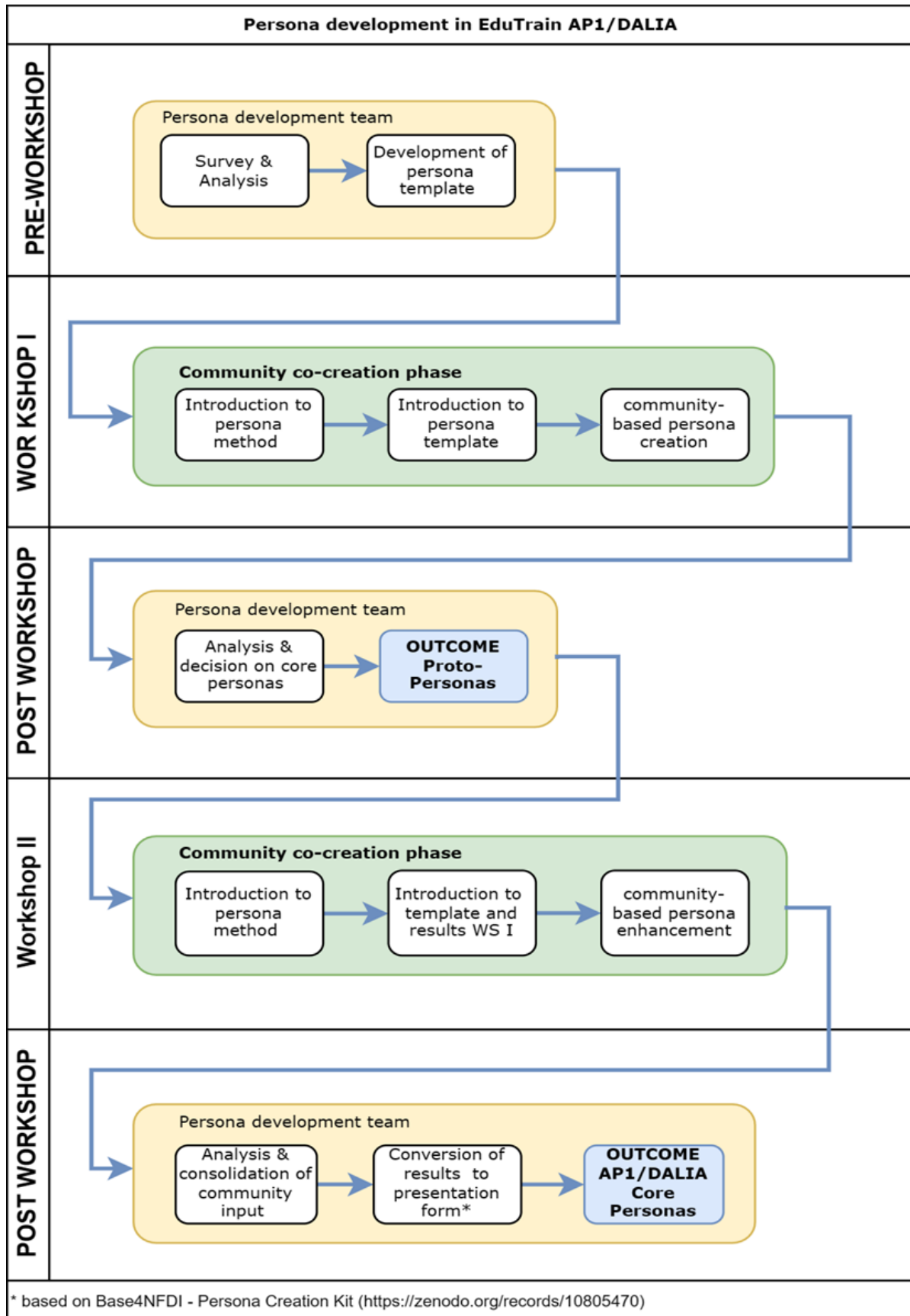


Figure 1: Process of persona development

3.1 Survey and analysis

Initial research reviewed user descriptions and personas across NFDI consortia to align with broader community expectations and evolving infrastructures such as data competence centers. The research included a review of existing user stories and personas, ensuring that DALIA remains aligned with the evolving requirements of the NFDI consortia and takes into account the current establishment phase of data competence centers.

3.1.1 Personas and user orientation in the NFDI landscape

In NFDI context, various consortia have adopted personas or related concepts – such as user roles, archetypes, or community stories – to tailor their services and training efforts to specific user groups. These representations help make the requirements of RDM more tangible and accessible, thereby supporting user-centered development across disciplines.

This section reviews different approaches to identify key practices and role models and analyses how different NFDI consortia approach user needs and implement persona-based strategies. It aims to identify existing practices, key target audiences, and potential role models that inform our own persona development process. Furthermore, the analysis highlights to what extent personas are embedded in the broader context of RDM-related education and training, and where conceptual or methodological gaps remain.

3.1.2 Typologies of personas and target groups across NFDI consortia and disciplines

Approaches of persona development and related concepts differ significantly across disciplines. While some consortia explicitly apply personas or similar formats, others work with broader target group definitions in the context of training and communication activities.

In the natural sciences, consortia such as DAPHNE4NFDI, FAIRmat, NFDI4Cat, NFDI4Chem, MaRDI, and PUNCH4NFDI primarily focus on learners, including researchers but also Master's students, and PhD candidates. PUNCH4NFDI is noteworthy for expanding its outreach to school students through accessible science education formats such as the floating exhibition space MS Wissenschaft¹. Both MaRDI and PUNCH4NFDI also address content providers, infrastructure staff, and educators, including data stewards and software developers. NFDI4Chem additionally targets academic faculty and early-career researchers, aiming to encourage engagement with RDM by offering tailored materials and persuasive communication. Each consortium

¹<https://ms-wissenschaft.de/en>

reflects its disciplinary focus – for example, NFDI4Chem centers on electronic lab notebooks, while NFDI4Cat emphasises continuous process descriptions.

In the engineering sciences, consortia such as NFDI4DataScience, NFDI4Energy, NFDI4Ing, NFDI-MatWerk, and NFDIxCs extend their efforts beyond academia. In addition to researchers, they also target industry partners and, in some cases, the general public. NFDI-MatWerk stands out for its direct support of educators by providing validated and well-documented workflows for the development of academic teaching materials.

In the life sciences, consortia such as FAIRagro, NFDI4Health, NFDI4Microbiota, and GHGA have developed comprehensive training infrastructures, though they have not yet introduced explicit personas or education-related use cases. NFDI4Biodiversity is a positive exception, offering structured self-learning modules and community-oriented training formats. Similarly, DataPLANT's "Data Train" initiative provides an integrated training concept that brings together different user roles in a coherent and structured way.

Overall, within the NFDI, persona-related formats are used inconsistently, with varying levels of detail and application. In response, Base4NFDI developed the openly shared Persona Creation Kit – a template designed to support the collaborative and consistent creation of personas (Manske & Lorenz, 2024). This resource provides a practical framework for aligning user needs with the design of tools and infrastructures, helping service teams and developers work from a shared, reusable foundation for persona-driven development across the NFDI.

An in-depth analysis of the NFDI consortia showed a shared focus on the needs of learners, lecturers, and content providers. To reflect these, a community-based co-design process was used to develop a core user persona for each group.

3.2 Workshop concept and template development

The workshop concept and materials (introductory slides and the original workshop Miro board) for the co-design phases were created within the development team (Petersen et al., 2025b). The slides familiarised participants with the persona method, while the Miro board template was used to collect notes and discussion contributions during the co-design phases.

3.3 Co-design phases

Two workshops (one in-person, one online) involved the NFDI community and beyond. Participants were introduced to the persona method, then worked in rotating groups on learner, teacher, and contributor personas. The second workshop refined the drafts from the first.

1. Speed-Dating with EduTrain Personas; Side-event during 1st Conference on Research Data Infrastructure (CoRDI), 14. September 2023, Karlsruhe.
2. DALIA OER Community Workshop No. 4, 10. October 2023, online.

Discussions addressed persona characteristics, RDM experience, and requirements with regard to EduTrain and DALIA.

3.4 Consolidation and transfer

In a post-workshop phase, the community input collected on the original workshop Miro board (Petersen et al., 2025b) was analysed, organised, and summarised by the development team, then transferred into the template provided with the Base4NFDI Persona Creation Kit (Manske & Lorenz, 2024) to produce the final consolidated persona presentations (Petersen et al., 2025a).

The personas presented here are yet to be fully implemented and used. They are meant to be used in use cases and user stories, but also for communication processes within the DALIA project team and the NFDI EduTrain. Furthermore, they build a starting point for further differentiation of user groups. Persona development is an ongoing process which includes regular reviews or revisions.

4 Persona descriptions

4.1 Learners

Mila Learner (Figure 2, Figure 3) represents users from various educational levels with basic RDM knowledge, high motivation, but limited data skills and limited familiarity with relevant topics, processes, and tools.

4.2 Lecturers

Nico Lecturer (Figure 4, Figure 5) embodies individuals who value accessible teaching materials, have pedagogical expertise, and act as role models for best practices while adapting to evolving requirements.

4.3 Content providers

Lara Content Provider (Figure 6, Figure 7) represents individuals who offer training with limited time and partial subject expertise. They prioritise well-structured, reusable materials in clearly defined topic areas and focus on collecting, sharing, and supplementing standardised and high-quality materials.



Figure 2: Persona Mila Learner (Rawpixel.com, n.d.; upklyak, n.d.)

Mila Learner – International PhD-Student

Mila

a 26-year-old international PhD student in her first year, shares a small flat in the city with a friend to cut costs while receiving support from her family. Her typical day involves waking up late, consuming copious amounts of coffee, and attending university until late in the evening. Weekends are reserved for parties with friends, and she dedicates two hours twice a week to a German course. Mila, a believer in ethical standards such as climate and global justice, values honesty, personal development, and accessibility.

With a keen interest in balancing family life and career, Mila faces uncertainties about reconciling the two. Language barriers persist as a newcomer to Germany, compounded by a lack of onboarding at her university. Despite these challenges, she endeavors to be a good researcher, emphasising a need for clear structures, practical approaches, and specific tools.

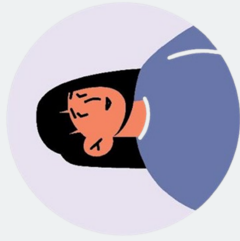
Mila has heard of Research Data Management (RDM) but lacks in-depth knowledge, not being familiar with tools or a systematic approach. She acknowledges the importance of good RDM but struggles to find supportive tools. Additionally, she desires to establish new tools but faces collaboration challenges within her working group.

In terms of communication and technology, Mila prefers chats and modern platforms like Twitter. Proficient in technology as a "normal" user, she acts as a multiplier, sharing RDM approaches with her home university.

The barriers and frustrations Mila encounters include uncertainty about reconciling family and career, a demanding workload as a PhD student, and frustration when things don't work out initially. Information gaps about training opportunities, coupled with a lack of onboarding for international students at her university, further contribute to her challenges.

Mila's interest in EduTrain and DALIA stems from her desire for structured training within her Doctoral Training Partnership (DTP) or university cohort. She values a clear schedule, structured curriculum, and courses in English. DALIA, in particular, interests her for sharing learning materials and supporting a blind PhD student.

Mila's preferred learning style involves hands-on trainings and self-learning, especially due to limitations in the university's learning environment. She gains information via EduTrain & DALIA from colleagues, e.g. at a retreat in her research project but also uses science-focused social media channels for communication. For self-learning materials she prefers short learning bits over extensive reading.



Age: 26

Work: PhD-Student

Location: Kiel, Germany

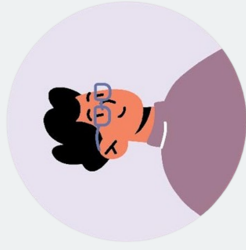
”
Embrace challenges as opportunities for growth, and let ethics guide your path to academic excellence.”
“

Figure 3: Description Mila Learner (Rawpixel.com, n.d.; upklyak, n.d.)



Figure 4: Persona Nico Lecturer (Rawpixel.com, n.d.; upklyak, n.d.)

Nico Lecturer – Postdoc



Age: 35

Work: Lecturer in Natural Science

Location: Marburg, Germany

Nico, a lecturer in natural sciences aged approximately 35, resides in the city with his recently married spouse. His daily routine involves early mornings, commuting to campus by bike, and dedicating late hours to personal research. However, administrative tasks consume 1-2 hours daily, leaving him overwhelmed due to excessive workload. Nico, a natural scientist with a penchant for a healthy, vegetarian diet, is deeply connected to his subject. He tailors learning materials to align with individual learning goals, catering to students below the Ph.D. level. Despite facing barriers such as short-term contracts, time constraints, and frustrations with lazy students, Nico aspires to maintain even-level communication between learners and himself, aiming to be both a good researcher and lecturer.

Communication and technology play a crucial role in Nico's professional life. Operating slightly in isolation due to home office and low involvement, he is not fully a digital native. However, he emphasises communication about his own enthusiasm and motivation.

Regarding Research Data Management (RDM), Nico recognises the need to learn but finds the effort required discouraging due to prejudice. Additional considerations in his academic life include dealing with funding requirements, embracing good scientific practice, prioritising lifelong learning, and requiring flexibility and an open-minded approach. He perceives #digitalphysics as more enticing than RDM in the field of physics.

Nico's interest in activities and offers from EduTrain and DALIA is extensive. Targeting bachelor students or others, he seeks guidance on using DALIA, preferring short and easy-to-reuse teaching materials related to his discipline. Nico emphasises the jigsaw classroom structure and desires support for quality assurance. In making RDM more appealing, he suggests avoiding PDFs and using LaTeX or Markdown. He expresses interest in AI basics, especially related to LLM, and guidance on using Jupyter notebooks or proprietary software.

Unique selling points that intrigue Nico include descriptions of brain masks based on image layers and RDM, cell counting, or scientific toolboxes. He requires RDM basics and a short Train-the-Trainer concept or modular best practices, recognising diverse needs across disciplines. Nico encourages teaching the use of BibTeX or similar systems for source and citation structuring, along with programming courses. Urgently, he needs discipline-specific material to meet his teaching requirements.

“Balancing the scales of academia, I pedal through challenges, fueled by curiosity, and driven to cultivate a rich learning environment where both students and research thrive.”

Figure 5: Description Nico Lecturer (Rawpixel.com, [n.d.](#); upklyak, [n.d.](#))



Figure 6: Persona Lara Content Provider (Rawpixel.com, n.d.; upklyak, n.d.)

Lara Content Provider – Postdoc



Age: 33

Work: Biologist

Location: Ulm, Germany

Lara, a 33-year-old entomologist, completed her Ph.D. in Beetle Entomology two years ago. She resides in a 3-room apartment near the university with her husband and 4-year-old son. Currently working part-time, Lara is a biologist with a bright mind, renowned for her curiosity, seeking new challenges after her postdoctoral tenure. Originally from Jena, she is accustomed to excellent childcare services and is a proficient organiser.

Lara's typical day involves an early start, reaching the university by 8:00 AM, and utilising her bike to drop her son at kindergarten by 7:30 AM. Beyond her academic responsibilities, Lara finds joy in dancing, both standard and formation, alongside her husband. Her interests extend outdoors, engaging in activities with her son, such as visits to the playground and zoo. An avid hiker, especially in forests, Lara contemplates becoming active in a political party or NGO. She aspires to integrate her work topics, including Research Data Management (RDM), into children's education by organising the "Doors Open" day for kids at the biology institute.

Lara values the distinction between analog "real" objects and digital sources and aims to help and share knowledge. Advocating for pesticide-free agriculture and preferring regional, biological food, she confronts challenges related to a full-time schedule, lack of sleep, and struggles with understanding DALIA.

Being a RDM specialist for two years, Lara conducts workshops and training for students in Biology or Chemistry. However, time constraints limit her focus on RDM topics fully, leading to insecurities about description and metadata schemes. She faces challenges with licensing in artistic corporations, particularly in her collaboration with a designer researching prehistoric beetles. Lara also contributes multimodal and hybrid data within a student working group, combining historic beetle drawings with new variants designed by the students.

Lara is meticulous with email communication, favoring in-person interactions and avoiding social media and apps like WhatsApp for work purposes. She prefers working at the office with colleagues rather than in solitude at home.

Considering her familiarity with RDM, Lara seeks activities and offers from EduTrain and DALIA to document and share innovative research processes through video documentation. She desires guidance on managing personal data in documentation and aims to define standards and quality requirements for materials. Lara expects the offerings to provide an overview and collection of data from various repositories, identify gaps, and improve existing materials. Additionally, she questions the differences between data stewards, RDM specialists, and contributors dealing with RDM topics "on the side."

Lara's involvement in instructional design remains unclear, and she wonders about the potential communication and information outside of NFDI structures. She is interested in the benefits of single methods and repositories and how offers from EduTrain and NFDI can extend to the public, including schools and the public sector, fostering connections between consortia and networks.

“Science is not just for the lab; it's for every curious mind to explore and protect our world”

Figure 7: Description Lara Content Provider (Rawpixel.com, n.d.; upklyak, n.d.)

5 Discussion

The personas *Mila Learner*, *Nico Lecturer* and *Lara Content Provider* were developed in a co-design process involving active members of the NFDI community and beyond. The personas were developed in an agile ad-hoc process based on a screening of existing personas and other target group descriptions in the various NFDI consortia. The personas presented here were therefore developed using a mixed methods approach combining the screening of existing target group descriptions and a subsequent co-design approach.

It is always difficult to define labels and to characterise people according to what they have in common. People can feel uncomfortable when they are pigeonholed into predefined roles. Templates simply cannot capture the individual qualities of each person, even if it quickly becomes apparent that many ultimately share similar needs. Thus, we considered the involvement of the user community into the persona development process as highly important as it creates trust in the personas. Engaging and involving the community is essential to the success of EduTrain and DALIA as community-driven initiatives. Albrechtsen et al. (2016) state that when users are included in the process of persona development, they bring their own perspectives, knowledge, and experiences to the process and one important implication of this is that the users are empowered to speak for themselves what may lead to a stronger engagement with products or services to be created. Authors such as Dittmar & Forbig (2019) have pointed out that multidisciplinary teamwork requires an increased understanding and appreciation for other disciplines and design activities. It is therefore advisable to establish design processes in which all members of the design team, including the users, can participate on an equal footing (cf. Mackay, 2003).

The practical development work showed that participants were not always familiar with the persona method and that the differentiation between personas, use cases and user stories of co-design in particular had to be clarified. This also needs to be considered in upcoming activities. The co-design approach was successful in that it resulted in the development of three core personas, which were provided with personal aspects and DALIA-related needs by the community. These can serve as a good basis for further differentiation. We see the need to further concretise the resulting personas around motivations, communication and interaction options, technical requirements, and design wishes in relation to DALIA. The systematic use of these personas for the description of use cases and user stories is pending.

6 Conclusion and next steps

The personas *Mila Learner*, *Nico Lecturer*, and *Lara Content Provider* serve as a strong foundation for further refinement. To better capture motivations, communication styles,

interaction preferences, technical requirements, and design expectations, these personas are supposed to be used to create user scenarios, with plans to expand their descriptions accordingly.

To effectively apply the personas in developing the DALIA platform — including its user interaction concept and content offerings — it is essential to further detail and differentiate them. This includes expanding them into use cases and user stories based on concrete user characteristics. The next step is to weigh up which specific needs and characteristics are crucial for the user-centered design of DALIA.

Templates based on core personas presented were created for the DALIA workshop "*Shaping EduTrain/DALIA Personas II – User Stories and Use Cases*", enabling the integration of key technical-interactive aspects of future DALIA users. While the core personas already help define target groups within the EduTrain context, combining them with individual user stories enhances their clarity and relevance. EduTrain aims to establish an ongoing persona-based process for identifying user needs.

These core personas can serve as a basis for additional personas tailored to specific contexts, such as NFDI consortia or the data competence centers funded since 2023. By linking personas to the RDM learning objectives matrix (Petersen et al., 2023), it may become possible to adapt learning content to specific user groups. This facilitates assigning users to relevant topics and generating tailored content suggestions.

Further discipline-specific personas based on the EduTrain/DALIA core personas would be a welcome development.

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