Scientific Communication and Community Building

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Abstract This chapter provides an overview of the manifestations and specifics of scientific communication and community building in the Digital Humanities. After a brief historical introduction, the chapter presents important definitions, actors, and focal points, as well as tools and initiatives. Despite innovation, the chapter shows how the opportunities of the digital paradigm in science communication are not yet fully being utilized and what can be done in the future to bring about change. Moreover, potentials and expertise of the Digital Humanities in this field, e. g., about the connection between ethical aspects and technological issues, are outlined. The chapter also shows how closely scientific communication and community building are related, particularly through social media.*

Keywords Scholarly Communication, Digital Publishing, Community Building, Digital Humanities

DISSEMINATION – INTRODUCTION TO THE SECTION

Communication is an essential part of science: researchers communicate both with each other and with the wider public or particular communities. While the intention and manifestation of the various acts of communication may differ depending on the stage of the research process, target group(s), and degree of formalization, the common threads at the heart of the scholarly communication process are questions of dissemination and access to scholarly information (De Silva & Vance 2017, 17 f.) as well as the emergence of scholarship.

* This chapter, including quotations in foreign languages, was translated from German by Brandon Watson.

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1. Standing on the Shoulders of Giants

In the 17th century, Isaac Newton claimed he had only succeeded in progressing further (i.e., achieving scientific progress) because he was standing on the shoulders of giants (i.e., because he could build on the works of those who had gone before).[1] The contemporary understanding of science is based on this fundamental principle.[2] However, according to Hagenhoff et al. (2007), the characteristics and requirements on the mechanisms of proof and access have changed fundamentally since Newton:

1. through the digital transformation of science (communication) and the associated change in the scientific record *(changing scholarly record)* as well as
2. the increasing openness of scholarly communication and the academic system, i.e. the greater role of open principles in communication and research processes.

2. Dissemination within the Humanities

The epistemic classification of the term *dissemination* in the knowledge organization of the Digital Humanities can be made in the context of the so-called "scholarly primitives" or "methodological commons" (Unsworth 2000; cf. Van der Weel & Praal 2020; Borek et al. 2021). The concept has been indicated as a component of the "digital scientific process and for the shaping of knowledge" (Borek et al. 2021, 322) as an upper category in the *Taxonomy of Digital Research Activities in the Humanities* (TaDiRAH[3]) and refined by subcategories *(narrower concepts)* such as *collaborating*, *commenting*, *communicating*, *crowdsourcing*, *publishing*, *sharing*, and *teaching*. The category *dissemination* is broadly defined in TaDiRAH with a focus on (co)sharing:

> disseminating refers to the activity of making objects of inquiry, results of research, or software and services available to fellow researchers or the wider public in a variety of more or less formal ways.[4]

This chapter outlines the main features of scientific communication and community building with a focus on the Digital Humanities to introduce the topic of dissemination

1 S. De Silva & Vance 2017, 101f. The phrase is often falsely attributed to Isaac Newton. It can actually be traced back to Bernhard of Chartres (12th Century) (Chen 2003, 135–166).

2 The functions of *scientific communication* have traditionally been analysed in terms of four key categories: *"registration, awareness, certification, and archive functions"* (Rosendaal & Geurts 1999, 14).

3 See https://tadirah.info (Accessed: 19 June 2024).

4 See https://vocabs.dariah.eu/tadirah/en/page/disseminating (Accessed: 19 June 2024).

in this compendium and to discuss certain aspects of the topic of dissemination. The focus is on an outline of historical developments, current key topics, and prospects for scientific communication and community building, as well as an examination of the conceptual connection between the two terms. Some of the aspects listed here are dealt with in greater depth in the following chapters of this compendium.

SCIENTIFIC COMMUNICATION

This section offers a definitional approach to the concept of scientific communication, including a brief social, science policy, and historical context, as well as an introduction to selected key topics.[5]

1. Localization by Definition

The terms scholarly or *scientific communication* (orig. "Wissenschaftskommunikation"), *science communication* (orig. "Wissenskommunikation"), and knowledge transfer can be distinguished from one another, even if there are overlaps and the terminology is currently in flux (Wissenschaftsrat 2016; Schuldt-Baumgart 2022).[6] The term *science communication* focuses narrowly on the impact of research in society and *knowledge transfer* on the systematic and targeted transfer of knowledge to the economy and society (Schuldt-Baumgart 2022). In contrast, the target groups, and goals of scientific communication, such as informing, sensitizing, inspiring, strengthening the reputation or legitimizing science, are more heterogeneous (ibid.).

In a broader sense, the term *science communication* refers to different forms of communication by and about science, the common denominator being scientific processes, methods, practices, and publications, e.g., articles or monographs, but also preliminary stages, data, and other communication formats aimed at different target groups. Traditionally, there is a distinction between internal and external science communication according to the sender-receiver principle (Fig. 1).[7] Internal science communication is aimed at internal scientific target groups (specialist public) and

5 Scientific communication can manifest itself in various ways. See, for example, COAR (https://www.coar-repositories.org) and DORA (https://sfdora.org). Both addresses were accessed on 19 June 2024. The chapters by C. Anderson (digital forms of publication) and J. Apel (research data) in this volume provide more information on these aspects.

6 In English publications, there is not always a clear distinction between *science communication, scholarly communication,* and *scientific communication.*

7 There are also other traditional approaches to the systematization of science communication, such as, overall system, institution, individual (macro, meso, and micro levels) (Dernbach et al. 2012).

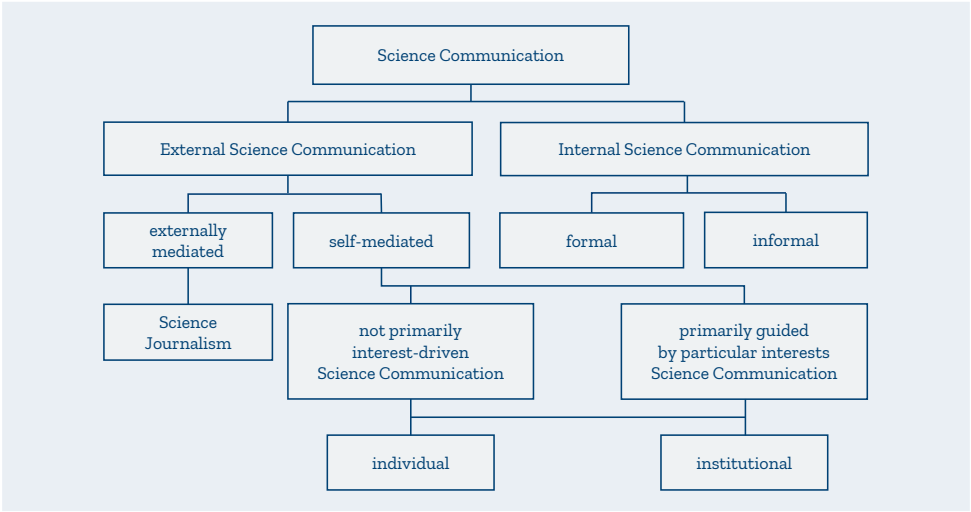

Fig. 1 Traditional systematization of science communication.

external science communication at target groups outside science (acatech 2017, 20–21; cf. Pasternack 2022, 42). However, the excessive emphasis on or equation of science communication with external science communication in current science and socio-political statements and policy papers, such as those of the Federal Ministry of Education and Research (BMBF 2019, 2) or the German Council of Science and Humanities (2021, 7), can be viewed critically due to the independent functions of internal and external science communication.

The distinction between formal and informal internal science communication (publication versus personal contact) is particularly important for community building (see below). The various activities can be modeled in an increasingly digitized and network-based publication cycle with the steps of writing, reviewing, publishing, storing and making accessible (library, repository), receiving, citing, annotating (etc.) (Umlauf & Gradmann 2014). Moreover, various dimensions of science communication can be considered, such as content, target group, style, format, motivation, and own role (Seltmann 2023, 2). A recent systematization approach proposes a stronger focus on the senders of science communication and based on this, distinguishes between one level of internal science communication *(science-to-science)* and three levels of external science communication *(science-to-public, public-to-science,* and *public-to-public)* (see Fig. 2) (Frick et al. 2021; Seltmann 2023, 2).

As a result of digitalization, the systematization of science communication, together with the structures of the science communication system, is undergoing major changes (acatech 2017, 20–21). Phenomena, such as open access, internet publication platforms, and social media are increasingly leading to “a convergence of different

Sender \ Receiver	Science	Public
Science	Science-to-Science	Science-to-Public
Public	Public-to-Science	Public-to-Public

Fig. 2 Four-part matrix of science communication.

forms of science communication" (acatech 2017, 21; cf. Weitze & Heckl 2016, 191). For this reason, the following section avoids sharp distinctions and instead focuses on selected key topics of science communication in the (Digital) Humanities with a focus on forms of science communication in which scientists themselves are directly involved as communicators.[8]

2. Science and Sociopolitical Positioning

In the context of science and socio-political discussions, external science communication has recently received renewed importance for public discourse and promoted as a task in the science system (Baumgärtner et al. 2021). Regarding this politically desired cultural shift (cf. BMBF 2019), a statement by humanities associations critically discussed the danger that public scientific discourse would only promote topics relevant to the public (Baumgärtner et al. 2021). Instead of an undifferentiated call for *more* science communication, the statement advocated for a differentiated, fundamental reflection on the goals, motives, expectations, and contexts of science communication (ibid., on the goals of science communication, cf. Ziegler & Fischer 2020). The critical discussion of the evaluation of research relevance by Fecher (2022) is similar. Proposed solutions include moving away from the so-called watering can principle and superficial approaches, such as camera training or social media workshops (ibid.). Instead, there should be a shift towards specific training for context-specific, target group-oriented, and problem-conscious science communication aimed at sub-groups, as well as the creation of fruitful framework conditions (keyword: serendipity) (ibid., cf. Frick & Seltmann 2023).

Technological developments, such as the latest generation of AI-supported text, image, or sound generation tools or 3D/VR technologies create new possibilities for science communication, yet they also must be critically evaluated. The discussion

8 Doing so largely excludes citizen-science based *public-to-public* and *public-to-science* forms of science communication (Hecker et al. 2018), as well as forms of science PR (i.e., external, institutional science communication primarily guided by interests) or science journalism (i.e., external, externally mediated science communication) (Wissenschaftsrat 2021).

about their potential and dangers is not only about their practical applications, but also about aspects of communication with society via such technologies (Schröder 2023). It is conceivable that scholars engaged in Digital Humanities could assume an influential position in this context.

3. Historical Aspects

Since the 17th century, the academic publication system has developed into a standardized and familiar form. Academic journals are crucial for formalized, internal academic communication (De Silva & Vance 2017, 17–24). A discipline-specific feature of the publication culture in the humanities is the formative role of books (monographs, edited volumes, etc.), hence the demand for these avenues of research to be considered alongside journal articles in science policy discourses, e.g., on open access (Söllner 2017; Winters 2020; Toledo 2020).

The commercialization of the publication market in the 21st century has led to a shift in focus from the scholarly societies that originally dominated the market to commercial players in the form of academic publishers (as monopolies or oligopolies), while at the same time the volume of publications has risen sharply since the Second World War (De Silva & Vance 2017, 17–24). Even if commercialization is less advanced in the humanities than in other disciplines (Larivière et al. 2015), Unsworth (2003) also painted a bleak picture for the humanities (esp. with regard to promotion and tenure procedures): "here [there] seems to be general agreement that the system of scholarly communication is not working – that it is broken, or breaking." He critically suggested that a better scholarly communication system should be based on the premises of appropriateness of the form of communication of research results and user comfort. Ultimately, the evaluation of research should be based on content quality criteria and impact, not on quantity or form (analog or digital):

> In a better world, high-quality, peer-reviewed information would be freely available soon after its creation; it would be digital by default, but optionally available in print for a price; it would be easy to find, and it would be available long after its creation, at a stable address, in a stable form (Unsworth 2003).

The following comments on key issues in scholarly communication in the (Digital) Humanities underline the continuing relevance of Unsworth's criticism, which is now twenty years old (cf. Heise 2018; Edmond 2020; Eve & Gray 2020; AG Digitales Publizieren 2021). The order of the key topics does not express any empirically substantiated value statement.

4. Key Issues

4.1 Changing Scholarly Record

The publishing culture in the humanities is strongly characterized by the print paradigm and reservations about digital publishing, such as doubts about long-term archiving and availability or quality assurance, have a negative impact on the acceptance of open access publications (Winters 2020, 345–347). Fluid and hybrid digital forms of academic publication that go beyond PDF are slowly gaining acceptance, partly because of the advantages associated with the change of media, such as "machine readability, multimedia, modifiability, easy copying, networkability, etc." (AG Digitales Publizieren 2021, para. 4; Winters 2020). Digital edition philology with the TEI guidelines has been established as the standard for digital editions, while remaining subject to dynamic development processes and subsequent requirements (see the chapter by A. v. Stockhausen in this volume, p. 335). One could first mention the possibilities of podcasts (from *iPod* and *broadcast*) as an example of more recent trends in the medial expansion of the publication spectrum,[9] which not only offer interesting perspectives for addressing different sub-populations and popularizing academic topics but can also influence the research process itself (Howard-Sukhil et al. 2021). In addition, there are other communication formats or research products that can be published along the open research cycle in accordance with the FAIR principles (see the chapter by J. Apel in this volume): Pre-registrations via *OSF Registries*[10], Preprints via *Preprints.org*[11] (general), *BodoArXiv*[12] (medieval) (cf. Dang 2017), or Open Peer Review Reports (see below). The possibility of linking publications with research data, software or code, or publishing them independently is also important (see the chapters by J. Apel and U. Henny-Krahmer in this volume).

4.2 Forms of Authorship

Throughout the digital transformation, the forms of publication and their mediality have changed as well as the forms of authorship "when knowledge processes are more collaborative and understood as dynamic and mapped transparently" (AG Digitales Publizieren 2021, para. 18). Collaborative, social writing processes and the verification of different roles are promoted by appropriate tools (e.g., wikis) or

9 Like most social media platforms, the podcast landscape is rapidly changing. Cf. RaDiHum20 (https://radihum20.de), Humanista (https://humanistathepodcast.com), and Price Lab Podcast (https://pricelab.sas.upenn.edu/podcast). All addresses were accessed on 19 June 2024.

10 See https://osf.io/registries (Accessed: 19 June 2024).

11 See https://www.preprints.org (Accessed: 19 June 2024).

12 See https://bodoarxiv.wordpress.com (Accessed: 19 June 2024).

taxonomies (e.g. *CReditT*[13]). One desideratum is better support through the development of adapted reference systems and citation methods (AG Digitales Publizieren 2021, para. 18–22; Ernst 2015).

4.3 Peer Review

Mechanisms to ensure the critical, neutral evaluation of scientific claims and sources are crucial in the scientific system, with efforts to increase quality and ensure the credibility of science (as opposed to fake science) being important drivers (De Silva & Vance 2017, 73–99). These tasks are performed by peer review (ibid., 74). Formalized peer review procedures are used for various publication products (e.g., *pre-publication* & *post-publication peer review*) and other research contexts (e.g., in the evaluation of research proposals and performance and other competitive selection procedures) (ibid., 73–99).

Although the organization and usefulness of peer review procedures are subject to critical debate, both in general (ibid., 74) and subject-specific terms (AG Digitales Publizieren 2021, paras. 45–55), formal review procedures are becoming the norm in the humanities. In an interdisciplinary field, such as the Digital Humanities, the bias against interdisciplinary research poses a challenge (ibid., 74); there are also differences in each discipline about the acceptance of different peer review procedures, e.g., closed peer review *(single blind* and *double blind)* and open peer review *(pre-* and *post-publication)* (ibid., 81). To be more transparent, open peer review procedures are gaining popularity (e.g., in the *Zeitschrift für digitale Geisteswissenschaften – ZfdG*)[14] as are aspects of the separation between content-related, formal, and technical review procedures (ibid., 82–86; Ross-Hellauer 2017; AG Digitales Publizieren 2021, paras. 54–57; Burghardt et al. 2022). In this context, preprint servers have become increasingly relevant in the humanities (Kleineberg & Kaden 2017).

4.4 The Concept of Publication

In humanities research, there is currently a controversial debate about the extent to which the concept of publication is linked to peer review or other formal quality assurance procedures, i.e., the extent to which they are considered a prerequisite for assessment as a publication (Edmond & Romary 2020).[15] While the use of formalized review procedures can lead to more confidence in the quality of digital publications (AG Digitales Publizieren 2021, para. 57), one must continue to discuss the praxis of

13 See https://credit.niso.org (Accessed: 19 June 2024).
14 See https://www.zfdg.de (Accessed: 19 June 2024).
15 See also the categorization of open access models, expressed using the colors grey, green, and gold.

recognition or evaluation criteria regarding the recognition of a greater diversity of media manifestations of science communication, as expressed by DORA.[16]

4.5 Open Access to Scientific Information

Since the 1970s, the commercialization of the journal market and, at times, significant increases in subscription costs, especially in the STEM field (the so-called journal crisis), have posed enormous challenges for academic libraries and other actors in the public information infrastructure, which are among the decisive factors for the emergence of the open access movement and the pursuit of open access to information (De Silva & Vance 2017, 17–40).[17] In addition, mega-journals, such as *PLOS One* or *Scientific Reports,* both more active in STEM, emerged as a new business model (Davis 2017). The focus of the largest scientific publishers has shifted from the sale of publishing products to data analytics and the sale of usage data. The risk of the development of proprietary workbenches or workflows by these actors (Bosman & Kramer 2018) for the science system has recently been increasingly recognized as problematic, so far without comprehensive consequences (Couldry & Mejias 2019; AWBI 2021; Kunz 2022).

Even if accepting open access paradigms presents the humanities with challenges specific to the academic discipline (cf. Heise 2018), they are now largely established (Söllner 2017; Kleineberg & Kaden 2017; DARIAH-EU 2018; Heise 2018; Wuttke & Gebert 2021; AG Digitales Publizieren 2021, paras. 79–111). Open access publication models and initiatives, such as the *scholarly led Open Library of Humanities* (OLH) or the *non-profit, academy owned* open access initiative *AmeliCA* from the Global South (Becerril-García 2019), are valuable additions to the publication spectrum, and most humanities journals listed in the DOAJ *(Directory of Open Access Journals)*[18] do not charge APC. An important goal of a scientific practice characterized by principles of openness is to make the research process more transparent, e.g., through the publication of work-in-progress, interim results, and products (in contrast to the traditional focus on research results), even involving external parties in the generation of research ideas *(open innovation),* whereby the opening up of academic communication through alternative, attractive, and comprehensible forms that are accessible to a wider audience plays an important role (Niemann et al. 2017; Wuttke & Gebert 2021, 436). For this reason, the development of alternative criteria and recognition

16 DORA stands for "Declaration of Research Assessment." Cf. https://sfdora.org (Accessed: 19 June 2024).

17 With reference to the discussion about the term "publication" (see above), the term "information" was deliberately chosen to symbolize greater diversity.

18 See https://doaj.org (Accessed: 19 June 2024). 192 of the 215 journals registered in the DOAJ do not charge APC (Accessed: April 2023).

mechanisms for science communication, such as strengthening the transparency or credibility of science, is necessary (see below). Conversely, this development also includes increasing the visibility and possibility of access to quality certified scientific publications in open access, so that interested parties are not blocked by a paywall. The importance of these goals has now been declared a global priority by UNESCO.[19]

4.6 Bibliodiversity

Bibliodiversity stands for efforts to maintain greater diversity regarding the forms of expression of academic communication and, in the context of the humanities, stands, among other things, for the strengthening of multilingualism in view of the increasing dominance of the English language (Balula et al. 2021; Balula & Leão 2021). The shift towards a monolingual, English-dominated publication and academic landscape driven by commercial publishers, but also by science policy and science-internal actors, jeopardizes the engagement with different cultures and peculiarities that often takes place in humanities and social science contexts as well as the inclusion of the broader public (Shi 2023).[20] This monolingual dominance also contributes to the divide between the global North and the global South and is thus at odds with the 17 UN Sustainable Development Goals.[21] The *Jussieu Call for Open Science and Bibliodiversity,* for example, calls for the strengthening of bibliodiversity.[22]

4.7 Quantification of Science (Impact Factors & Co.)

In view of the increasing amount of information, there is a desire for objective, quantitative mechanisms that can replace time-consuming qualitative evaluation procedures (De Silva and Vance 2017, 101f.). On the level of journal articles, the measurement of citation-based impact is based on the presumed correlation between the number of citations and the *impact* of a publication, however, this result should be viewed critically due to fundamental problems (ibid.). The same applies to the *Journal Impact Factor* (JIF), which was originally developed to assess the quality of journals and is now often incorrectly used to assess individual research performance of research articles (ibid., 104–108). Moreover, prevalent citation indexes can often only

19 UNESCO recommendation on Open Science (2021): https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en (Accessed: 19 June 2024).

20 Interesting, yet beyond the scope of this chapter, is the critical discussion of the alternative positive view of Latin as a language of science and the negative view of national-language science and the resulting welcome for the establishment of English as a language of science (Voigt 2012, 9).

21 See https://sdgs.un.org/goals (Accessed: 19 June 2024).

22 See https://jussieucall.org/jussieu-call (Accessed: 19 June 2024).

be used fully functionally for a fee (e.g., Web of Science, Scopus), which is why open citation indexes are being parallelly developed (Peroni & Shotton 2020).[23]

The aim of the Metrics-Literacies Project (Maggio et al. 2022)[24] is to curb the careless use of these methods in light of the critique of bibliometric processes, such as the JIF or the h-index, as well as of the use of alternative indicators (altmetrics), for assessing the quality of individual publications or the research performance of individual persons or research groups, the acquisition of a basic understanding of the most common methods, and their justified points of criticism and disciplinary differences in the context of academic research. In addition, these are internal scientific factors that contribute little to the broader impact of research (De Silva and Vance 2017, 109–112; Wróblewska 2021). Regarding the evaluation of science communication beyond bibliometric methods, there is a rich spectrum of methods only slowly arriving in practice (Niemann et al. 2023).

4.8 Social Media

The increasing role of social media is understood as a key factor in blurring the boundary between internal and external science communication (acatech 2017, 11). Social media includes:

> individual formats such as blogs and podcasts, which are usually operated by one person or organization, as well as collective formats such as social network sites (SNS, such as Facebook), microblogging services (such as Twitter), video and photo platforms (such as YouTube or Instagram) and wikis (such as Wikipedia), in each of which a large number of networked users participate within a single contribution (acatech 2017, 11).[25]

In the decentralized Web 2.0, the so-called participatory web, anyone can be a sender and receiver, for which the term *prosumer*, an artificial word made up of *consumer* and *producer*, was coined. The advantages and disadvantages of this development are directly relevant to science communication on the one hand yet also go beyond this narrow context (Peters 2023; cf. Voigt 2012, 9–10). Some advantages include the empowerment of individuals to generate extensive reach independently of gatekeepers like publishers, journals, etc., while the disadvantages include the collection and evaluation of data (e.g., through commercial data tracking, esp. big data), dependence

23 See http://opencitations.net/index (Accessed: 19 June 2024).

24 See https://www.scholcommlab.ca/research/metrics-literacies (Accessed: 19 June 2024).

25 There is possibly also a difference between social networks and content-sharing services (Peters 2023).

on non-transparent algorithms geared towards optimizing advertising, the risk of political manipulation, and quality assurance issues (Schöch 2016; Könneker 2020).

Anyone can participate in the main functions of social media, such as information dissemination (creating and publishing) and information transfer (networking, commenting, annotating, sharing, and subscribing), thereby becoming part of the diffusion of information (Peters 2023). In this respect, overlaps between science communication processes and social aspects of community building become apparent (Seltmann 2023, 3). However, the increasing commercialization of Web 2.0 reinforces existing tendencies towards the commercialization of scholarly communication and leads to conflicts under copyright or data protection law. This process is based on open protocols and accomplished by proprietary internet platforms and services, in particular through the so-called platform economy, including social media (Peters 2023, 691). As a result, non-profit publication and social media platforms and infrastructures are becoming increasingly important (AG Digitales Publizieren 2021, paras. 90 f.). These include, for example, approaches such as ORCiD (digital author profile, PID),[26] (academic) social media (e.g., *Humanities Commons*),[27] academic blogs,[28] or tools of the so-called Fediverse[29] as alternatives to commercial social media platforms (Brembs et al. 2023).

By focusing on user-generated content, social media call into question traditional academic publication and communication practices, which can lead to reservations about their academic nature within the humanities establishment (König 2015; Geier & Gottschling 2019). It is not always easy to prove to what extent and with what effect social media activities by academics reach target groups inside and outside academia. However, a lack of formal recognition mechanisms and a lack of practical skills (Könneker 2020) can have a disparaging effect and lead to their inherent potential remaining underdeveloped (König 2015). One negative effect can be the currently low participation of German scientists with their specialist expertise in social media discourses and thus their lack of a counterpoint to populist figures (Könneker 2020). At the same time, science communication on such channels is suitable for promoting internal and direct public dialog and thus for stimulating a broad exchange on scientific projects, methods, and findings (Geier & Gottschling 2019, 284).

26 See https://orcid.org (Accessed: 19 June 2024).

27 See https://hcommons.org (Accessed: 19 June 2024).

28 Such as on *Hypotheses,* the blog channel for the humanities and social sciences.

29 The *Fediverse* is a network of federated social networks and other services based on the open communication protocol ActivityPub (Wikipedia 2023, König 2022).

4.9 The Role of Libraries

Libraries function as "service providers and laboratories of science communication" (Frick et al. 2021), particularly in the non-profit area of science communication.[30] For the humanities, this pairing is a continuation of a long tradition. As so-called memory institutions, the collection, preservation, and availability of information is one of the most fundamental tasks of libraries, whose range of tasks has shifted in the course of the digital transformation and the increasing importance of open science principles from safekeeping and preservation (including reference systems) to active support of the entire publication cycle, including publication processes (OJS, repositories, consulting, university publishers) (Neuroth 2017; AG Digitales Publizieren 2021, para. 15). These activities also include current developments such as the hosting of decentralized Mastodon servers in the Fediverse, e. g., by the Max Planck Digital Library[31] or the Staatsbibliothek zu Berlin.[32] The course of these developments is difficult to predict; however, the dedicated positioning as places of knowledge and its curation offers libraries a promising perspective for the future (Brembs & Siems 2023).

5. Interim Conclusion

On the one hand, the way the academic system is opening up along various parameters is leading to an increasing diversity of products, channels, and target groups. However, on the other hand, Digital Humanities scholars are clinging to traditional paradigms of academic communication despite a claim to innovation (Nyhan 2020; Sahle & Neuber 2022).

Scholarly communication is an intrinsic part of the Digital Humanities, and there are many corresponding activities that deal with topics of scholarly communication and digital publishing. Future theory development will show whether terms like *Public Humanities* will prevail (Burghardt 2020; Gundermann et al. 2021; Schwan & Thomson 2022; Seltmann 2023).

30 Hence why the development of competence in this area is becoming increasingly important (Frick & Seltmann 2024).

31 See https://social.mpdl.mpg.de (Accessed: 19 June 2024).

32 See https://openbiblio.social/about (Accessed: 19 June 2024).

COMMUNITY BUILDING

This subsection provides an approach to defining the term *Community Building*,[33] including historical developments, as well as its fundamental aspects (networks, resources and tools, training and education, and the promotion of collaborative projects and initiatives).

1. Definition

A comprehensive theoretical localization of the term *Community Building* has yet to be recorded in the Digital Humanities. The literature mainly deals with practical approaches, opportunities, and challenges (Busch et al. 2016; Prescott 2016; Fitzpatrick 2020).

The following analysis argues that at the heart of Community Building are social processes related to networking and science communication. Ultimately, given the tools of social media and Web 2.0, the relevant functions of Community Building are increasingly overlapping and lead to blurred boundaries between academic communication and community building. One example is *academia.edu*,[34] a scientific social network mainly used by scientists for two functions:

1. Science communication: promoting and making available their own publications (and other scientific achievements) (legally controversial due to possible copyright infringements associated with this); and
2. Community Building: forms of scientific networking.

However, the academic community is highly critical of *academia.edu* due to its opaque algorithms and access logic and the commercial business model based on them, as well as data protection and copyright issues (Schöch 2016; Fitzpatrick 2020, 351–353).

Community Building has both individual and collective elements. Understood from an interdisciplinary perspective, however, a perspective transcending the individual is more relevant from a sociology of science perspective. The focus on collective aspects, i.e., associations of like-minded scholars with different degrees of institutionalization, Community Building in the Digital Humanities is then based not only on meta-level oscillation between the humanities and computer science, but

33 The German equivalents of the term are *Gemeinschaftsbildung* and *Gemeinschaftsaufbau*. Usually, however, the english term is also used here.

34 See https://www.academia.edu (Accessed: 19 June 2024).

also between different disciplines within the Digital Humanities (Sahle 2015; Benatti et al. 2021, paras. 14 f.). Due to the intrinsic interdisciplinarity (Klein 2015), digital scholars are faced with the challenge of networking beyond their respective narrower scholarly societies. The exchange across traditional disciplinary or organizational boundaries is crucial for strengthening the field of the Digital Humanities, particularly for the exploration of common research interests (Wuttke 2022, para. 53).

The explorations in this subsection are based on the following working definition of Community Building in the context of Digital Humanities:

> The term *Community Building* refers to activities and efforts to create suitable conditions for the development of an open and inclusive community of researchers, practitioners, students, and other interested parties within the Digital Humanities. Community Building aims to promote the exchange of ideas, knowledge, and resources. By building a strong community, the Digital Humanities can grow as a field, advance knowledge, and promote collaboration across disciplinary and geographic boundaries.

Four fundamental aspects of Community Building are explained in more detail below:

1. Community Building through networking,
2. resources tools and infrastructures,
3. training and education as a Community Building task,
4. collaboration, and Community Building projects.

2. Community Building Through Networking

The first aspect of Community Building concerns the creation of networks, platforms, and opportunities to share projects, ideas, and challenges and to learn, communicate and collaborate with each other. One aim is to raise awareness of the added value of digital research methods and to share good practices, projects, and infrastructures (Busch et al. 2016, 279). In networking activities, one needs to strengthen thematic dialog so that communication is not one-sided and the network "is not used purely as an information and marketing platform or for a one-sided information interest," but used to explore potentials like identifying needs, building expertise, interdisciplinary networking, and creating reach (external impact) (ibid., 281 f.).

In the history of science, the exchange of communication accelerated by the journals established in the 17th century is seen as initiating the development of the *scientific community* and the differentiation of scholarly societies (disciplines) (Voigt 2012, 13). However, access to this community was difficult for scientists outside an elite group (ibid.). Despite the justified criticism of the *invisible college* (ibid.), *scholarly*

societies emerged as part of this process since the early modern period and have since become less elitist given their emphasis on Community Building.

Scholarly societies are formal, self-governing scientific organizations. They consist of individuals with the same values, with the historical aim of promoting scholarly communication between their members and the wider intellectual world, e.g., through newsletters, meetings, journals, and conferences (Fitzpatrick 2020, 353). They also offer opportunities for Community Building through conference participation, networking, and collaboration, which are highly valued by members (Winters 2020, 343). Examples of scholarly societies in the Digital Humanities include the DHd – *Association for Digital Humanities in German Speaking Areas* ("DHd-Verband"),[35] the *European Association for Digital Humanities* (EADH),[36] and the international umbrella organization *Alliance of Digital Humanities Associations* (ADHO)[37] (Prescott 2016).

Other examples of formalized associations include digital branches, working groups, initiatives within individual scholarly societies,[38] thematically relevant (inter)national research infrastructures (see below), and regional or local research associations such as *mainzed*[39] (located in Mainz), the Heidelberg *THEOLAB*[40], or Digital Humanities centers[41], such as *the Trier Center for Digital Humanities*[42]. Informal structures of low-threshold networking and support, such as DH groups, brown bag lunches, or ad hoc working groups, also have important functions as nuclei or multipliers (Burghardt & Wolff 2015; Roeder et al. 2019; Wuttke 2022, para. 53). The forms of networking activities and tools in the Digital Humanities and the specific challenges involved in establishing them are ultimately as diverse as their different target groups and framework conditions: Networking takes place through conferences and workshops, among other things, as well as increasingly through online forums, social media, and other digital communication channels (Estill et al. 2022; see below).

3. Resources, Tools, and Infrastructure

The provision of resources, tools, and infrastructure that meet the needs of the community also need to be considered under the aspect of Community Building, including but not limited to, the development of open-source software, the provision of

35 See https://dig-hum.de (Accessed: 19 June 2024).
36 See http://eadh.org (Accessed: 19 June 2024).
37 See https://adho.org (Accessed: 19 June 2024).
38 See https://dig-hum.de/initiativen-den-geisteswissenschaftlichen-fachcommunities (Accessed: 19 June 2024).
39 See http://mainzed.org (Accessed: 19 June 2024).
40 See https://theolab.hypotheses.org (Accessed: 19 June 2024).
41 See https://dhcenternet.org (Accessed: 19 June 2024).
42 See https://tcdh.uni-trier.de/de (Accessed: 19 June 2024).

databases, digital collections, and other digital resources. Sustaining these aspects is ultimately based on the community, i. e., on their provision as digital commons for the most open use possible (Dulong De Rosnay & Stalder 2020). Only their constant transfer to other contexts and updating through further development, scientific communication, or their use in teaching leads to true sustainability through appropriation by different communities as opposed to static preservation through "freezing" (Fenlon et al. 2023). By sharing access to tools and resources, community members can work more efficiently and learn from each other.

For the role of infrastructures in the Digital Humanities, such as CLARIN *(Common Language Resources and Technology Infrastructure)*[43], DARIAH *(Digital Research Infrastructure for the Arts and Humanities)*[44] or RESILIENCE *(REligious Studies Infrastructure. TooLs, Innovation, Experts, conNections and Centres in Europe),*[45] reference should also be made to the ESFRI roadmap at European level.[46] There are essential elements of non-commercial community spaces and services, including research infrastructures, academic societies, and academic libraries.

For a long time, exchanges between researchers were limited to internal forms of communication, i. e., informal forms such as letters or personal exchanges, the landscape was formalized in the 17th century with the founding of the first scientific journals. For a long time, informal communication was dominated by traditional methods such as circular letters, meetings, journals, and conferences. The scene changed drastically with the introduction of the internet, which brought forth applications and forms suitable for a wide range of people to exchange and disseminate informal news quickly and cost-effectively, while also expanding the tools of Community Building to include a digital spectrum, such as mailing lists (O'Donnell 2020). The *scientific community* became more tangible for individual scientists through the new technological possibilities of exchanging information with remote and scattered communication partners (Voigt 2012, 14).

Excursus: Academic Mailing Lists – From Science Communication to Community Building

This excursus outlines the changing role of mailing lists *(academic listserv)* in the Digital Humanities as an example of the close connection between academic communication and Community Building.

43 See https://www.clarin.eu (Accessed: 19 June 2024).
44 See https://www.dariah.eu (Accessed: 19 June 2024). Vgl. Edmond et al. (2020).
45 See https://www.resilience-ri.eu (Accessed: 19 June 2024).
46 See https://roadmap2021.esfri.eu/projects-and-landmarks/browse-the-catalogue/?domain=Social+%26+Cultural+Innovation (Accessed: 19 June 2024).

Mailing lists were adopted very early on in the development of the Digital Humanities given their interdisciplinary nature; the Digital Humanities were, and still are, more *dispersed* than traditional humanities communities. In their early phase (mid-1980s, early 1990s), academic mailing lists in the Digital Humanities were promising for scholarly communication primarily because of their potential to overcome geographical and temporal barriers to bring people together as a "potentially revolutionary replacement for a variety of formal academic communication channels, such as the college classroom, the scholarly journal, the academic conference, and even the scholarly society" (O'Donnell 2020, 185) in a thematically grouped or centrally organized or moderated form. Its second, less common use in the spectrum of Community Building, as an "invisible water cooler" (ibid., 191), is more familiar today. The familiarity is partly due to an adoption by commercial social media platforms like Facebook, Twitter, and Instagram, and partly because it is now standard for academic mailing lists (e.g., originally *Digital Medievalist*[47], *Global Outlook::Digital Humanities*[48]). Here, the mailing list becomes a place for discussion whose members can ask and answer questions, publish announcements and, at least in the early years, hold long and short discussions, debates, and post comments (ibid., 192). This method of communication is comparable to other academic para-discussions (e.g., informal conversations in the hallways of conferences or institutions) (ibid., 194). Even today, mailing lists function as digital "water coolers" and have become the most important tool(s) for academic information dissemination (ibid., 185).

> Academic mailing lists have become a core part of scholarly para- and meta-communication […]. With the advent of the listserv, academics organizing colloquia or conferences, or putting together special collections or journal issues can use the new technology to reach a far wider network of potential participants in a far shorter period of time, including non-members and people outside their immediate circle of acquaintances. While this was rarely identified by the pioneers of the new technology as a potential benefit, it has turned out, in the end, to represent the real revolutionary development, creating a significant improvement in access for marginalized groups and people working outside the main research centres that in many ways represent a far greater disruption of scholarly practice than the early enthusiasts of the listserv-as-journal hoped to create (ibid., 197f.).

However, the focus is now more on the distribution of information or requests for information since heated discussions often led to complaints (ibid., 196).

In specific ways, online communities are helping to overcome the academic equivalent of the digital divide (ibid., 202). Some online academic communities still

47 See https://journal.digitalmedievalist.org (Accessed: 19 June 2024).
48 See http://www.globaloutlookdh.org (Accessed: 19 June 2024).

using mailing lists, such as the above mentioned, have been complemented over time by academic activities that are not based on email lists or even offline (ibid., 198). In addition, online academic communities emerged on commercial social media platforms to promote social communication (ibid.). Due to increasing criticism of commercial platforms and complicated developments regarding individual platforms (e.g., Twitter or rather X), a new generation of non-commercial online academic communities is currently emerging. In addition to versatile *scholarly networks* with a focus on the humanities, such as *Humanities Commons*[49], or *MLA Commons*[50], subject-specific communities are emerging for the Digital Humanities, such as the Mastodon server *Fedihum*[51].

Despite some overlaps, scholarly societies and online communities have so far had rather different (self-defined) tasks and roles:

1. Scholarly societies: Certification (in the sense of evaluation, assessment, e.g. journals, annual conferences, prizes) and lobbying;[52]
2. Online communities: networking and informal exchange.

For scholarly societies, offering and using non-commercial services for communicating research can make contribute to strengthening the sense of community among members, as well as strengthening their visibility and their specific scientific goals and values, while also strengthening the scholarly led science system in general. According to Fitzpatrick (2020, 351–353), these and other approaches, e.g., the extent to which learned societies can contribute to solving previously unresolved issues in related areas such as research data management (e.g. by creating *social communities* around data), should be pursued further.

Community Building includes both online and offline activities. There is a close connection between Community Building, internal, informal scientific communication and the basic social conditions of the knowledge community:

> Internal, informal science communication structures and organizes the social system of science and its knowledge production. It precedes formal scientific communication, with peers exchanging ideas at workshops, during conference breaks, via telephone or in email discussions. This social network is characterized by a high degree of interaction and the exchange of current information, while at the same time restricting access and making it more difficult to access (Voigt 2012, 17f.).

49 See https://hcommons.org (Accessed: 19 June 2024).
50 See https://mla.hcommons.org (Accessed: 19 June 2024).
51 See https://fedihum.org/home (Accessed: 19 June 2024).
52 Community Building can also play an important role in scholarly societies.

These claims underline the fact that informal communication in the context of community building is often the basis for the development of new research ideas and collaborations.[53]

4. Training and Education as Task of Community Building

The third aspect of community building is the support of training, education, and mentoring programs to strengthen the digital competencies and skills of scholars in the humanities.[54] By strengthening skills within the community, members can apply digital methods in their own areas of research and practice or become community members. While some specialize in Digital Humanities, others want to acquire the ability to use digital methods without immediately specializing in this field and making it the focus of their research career (Benatti et al. 2021, para. 1). The latter do not yet identify themselves as Digital Humanities scholars (i. e., they are not directly part of the *community of practice*), but still want to and can benefit from digital methods:

> The non-identifying DHer represents a significant proportion of those reaching out for relevant training. Thus it is essential for us to consider how other models – of DH, of pedagogy, and of learning – might support such learners to engage with critical digital humanities practices in a meaningful way (Benatti et al. 2021, para. 1).

The learning needs of different target groups can be met, e. g., by supporting the organization of training courses, workshops, or online courses to promote the interdisciplinary, shared use of digital methods, technologies, and tools, but communities can also be trained using forms and formats, as in the case of the *Programming Historian* initiative.[55] Not only are formats important, but so is the agreement on framework conditions, such as frameworks for digital literacy, scholarship, and mentoring programs or internships (McCarl 2021). These meta-discussions are important building blocks of Community Building and participation in the community of practice in the Digital Humanities, which in turn can be important for the development of a personal learning network in the service of informal continuing education. The existence of

53 Not least for this reason, the loss of personal, informal conversations and encounters during online events was lamented, which led to fewer bonds and the generation of new ideas and collaborations. Systematic subject-specific studies of this phenomenon do not appear to be available.

54 This subsection touches on some aspects of *Digital Humanities pedagogy.* The anthologies Hirsch (2012); Battershill & Ross (2017); and Croxall & Jakacki (2023) should be mentioned here as representative of the extensive literature.

55 See https://programminghistorian.org (Accessed: 19 June 2024).

corresponding offers can therefore be an important incentive to join corresponding informal and formal communities.

5. Cooperation and Projects in the Spirit of Community Building

The fourth and final aspect is the promotion of collaborative projects and initiatives within the community. This aspect of Community Building is discussed separately due to the centrality of collaborative practices in the Digital Humanities – most recently emphasized by the motto "Collaboration as Opportunity" of the global Digital Humanities Conference (DH 2023)[56] – despite overlaps with the previous three aspects.

Collaborative practices and projects include, for example, the joint development of research projects, cooperation in the creation of digital resources, or the organization of joint events. By working together, community members can learn from each other, explore synergies, and achieve common goals. Institutions, research funders, and organizations, such as scholarly societies, can support collaborative initiatives with resources and funding. Grassroots initiatives from the field of Digital Humanities, such as vDHd2021[57] (as a community-driven alternative format for the annual conference of the DHd Association, which was postponed due to the pandemic) or *Saving Ukrainian Cultural Heritage Online* (SUCHO),[58] as a politically motivated global initiative for the preservation of Ukrainian cultural heritage, demonstrate the inherent strength of communities.

While the advantages of collaborative practices in an interdisciplinary field such as the Digital Humanities are apparent, there are also obstacles to overcome. These include, for example, tenure and promotion processes and evaluation criteria (Edmond 2016; Ernst 2015; Huculak & Goddard 2016). Scholarly societies and other community-based interest groups can promote the further development of evaluation criteria of both a general (e.g., DORA[59]) and subject-specific nature (e.g. *MLA Guidelines for Evaluating Work in Digital Humanities and Digital Media*[60]) (see also CoARA[61]).

56 "This year's conference theme 'Collaboration as Opportunity' showcases transdisciplinary and transnational collaboration, with a special focus on the thriving South-Eastern European Digital Humanities community. It will explore how mutual empowerment and collaboration of neighboring countries – regardless of continent and geopolitical placement – can transform regional hubs of expertise to international networks of excellent research, to the benefit of the global DH community" https://dh2023.adho.org (Accessed: 19 June 2024).

57 See https://vdhd2021.hypotheses.org (Accessed: 19 June 2024).

58 https://www.sucho.org (Accessed: 19 June 2024).

59 https://sfdora.org (Accessed: 19 June 2024).

60 https://www.mla.org/About-Us/Governance/Committees/Committee-Listings/Professional-Issues/Committee-on-Information-Technology/Guidelines-for-Evaluating-Work-in-Digital-Humanities-and-Digital-Media (Accessed: 19 June 2024).

61 https://coara.eu (Accessed: 19 June 2024).

6. Conclusion and Outlook

Science communication and Community Building have changed significantly over time due to internationalization, globalization, and digitalization. The socio-technological change described (e.g., the internet, social web, digital research methods, etc.) indicates an increasing reorientation from self-interest to a community of sharing, supported by new technologies and guidelines to promote openness at national and international level, e.g., German Research Foundation (DFG) or European Research Council (ERC). Researchers are increasingly recognizing how they can intrinsically benefit from sharing through greater openness. In turn, not only can academics benefit from better access or greater visibility, embracing open values also has benefits for society and the economy. Digital Humanities scholars are facing challenging opportunities to bring ethical values and technological expertise to discussions and technology impact assessments around current topics such as the use of AI tools through their specific perspective. Doing so reinforces the point that science communication is not only the communication of science but also about communication about science itself.

The paradigm shifts from print to digital and from closed to open are externalizing parts of science communication as well as community building. The desired greater participation of the broader public creates new challenges that should be further investigated, esp. regarding their influence on trust in science (Soderberg et al. 2020).

To achieve innovative, non-commercial, science-appropriate communication of research, new and different formats and infrastructures are needed that do not currently exist or are still in their infancy. What is needed is not only greater acceptance and support for digital, open, and collaborative approaches and more skills development, but also more courage to experiment.

Academics are central to the processes described. However, given their diverse tasks in research, teaching, and professional uncertainties, they often lack the time to engage intensively with the latest developments in science communication and its practice. Although it is advantageous for them to possess a more profound understanding of the scholarly communication system and the associated elements that have been previously discussed, an alternative approach could be to rely on the structures of scholarly infrastructure that are based on the division of labour for specific aspects, in order to navigate the ever-changing landscape (publications, networking, evaluation). Nevertheless, academics should not relinquish responsibility, but should actively participate in the further development of these aspects and be closely involved in the design of corresponding services to promote their usefulness and acceptance and counteract the risk of disruptive innovations.

Quality assurance plays a crucial role in ensuring the credibility and reliability of scholarly results. There is a case for relying less on external proxies to assess quality in the future and instead investing more time and resources in better framework conditions for the open assessment of scientific achievements, e.g., through

open access publications, open data and reproducible or more transparent research practices. Sustainable and FAIR access to scientific data and research results is an important prerequisite for preserving valuable information for the future in a reusable form. Scholars should strive to regain control over their own workflows and means of communication or develop alternative approaches such as *scholarly-led* publishing. In this respect, scientific policy and academic institutions have a major responsibility for support and funding these efforts.

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Fig. 1: Traditional systematization of science communication, source: acatech 2017, 21.

Fig. 2: Fourfold matrix of science communication, source: Seltmann 2023, 2.