

# Information Literacy, Epistemic Cultures and the Question “Who Needs What?”

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## Abstract

This conference paper introduces "Information Didactics", defining it as a new didactics concept centering on the analysis of epistemic-culture-specific behaviour as a basis for the development of instructional activities. It broadens existing traditional conceptions of Information Literacy (IL) to create a universally adoptable didactical concept applicable not only to classical IL training but also to other instructional activities in the field of Information Science, for example the development of data literacy skills.

**Keywords:** Information Didactics, Information Literacy

## 1 What is Information Didactics?

Information didactics deals with learning processes related to the handling of information.<sup>1</sup> One of the fundamental hypotheses posited by information didactics is the dependence of the specific types of information, and the respective handling of that information, on the epistemic culture context of the learners.<sup>2</sup>

With regard to theoretical modelling, the objective of information didactics is to:

- identify specific types of information in different social contexts (epistemic culture-oriented information typology),
- describe and analyze specific types of practical information handling in these contexts (epistemic culture-based information practice),
- take account of the pre-requisites involved in information handling in these contexts (epistemic culture-specific requirement profiles), and in addition
- take into consideration the dominant learning practices in these contexts (epistemic culture-specific didactic practice).

The application-related goal of information didactics consists in the (further) development of didactic concepts capable of supporting learning processes relating to the competent handling of information in line with the type of epistemic culture background applicable to each particular case. Information didactics is particularly relevant in interdisciplinary teaching and the transdisciplinary transfer of knowledge, as here the

character of the teachers' epistemic culture will differ from that of the learners. This is the general rule within the context of practice-centered information brokerage activities.

The term "information didactics" was coined by the linguist Matthias Ballod in his 2007 habilitation thesis. Here Ballod presents arguments in favour of a general didactics of information transfer against the background of the digital transformation, i.e. a didactics delivering concepts and methods for teaching those skills and abilities enabling the competent handling of information. Applied to information science, his concept of information didactics can be described as a didactics of information literacy in the sense of a didactics related to the handling of data, information, information infrastructures, tools for the production and provision of information, strategies of information seeking, and the related ethical, legal, economic and social issues. Within the taxonomy of didactics in general, it is to be understood as a concept covering the whole area and including content of interdisciplinary relevance, analogous to media didactics. However, while Ballod bases his concept on a semiotic perception of information and concentrates on its further theoretical development as the foundation of a transfer science with the goal of describing, designing, controlling and optimizing knowledge transfer processes, the unsystematic empirical application examples he uses to illustrate the concept of information didactics in his habilitation treatise focus primarily on teaching the use of digital information resources such as subject databases or search engines. The practical application of information didactics is thereby not only eclipsed by the theoretical agenda but also by reflectance from the information science oriented discussion on information literacy teaching.

In 2016, one of the authors of this article was appointed to the Chair of Information Science and Knowledge Transfer at the Faculty of Information Science of the FH Potsdam, the first known international use of the designation. Although the definition developed within the remit of this professorship, and here presented by the authors of this article, does indeed make reference to Ballod's concept, it also simultaneously incorporates an information science and sociological perspective into the definition by favouring a fundamental enquiry into the epistemological origins of information didactics over a topical agenda. The next section will take a closer look at this perception of information didactics. The corresponding remarks are to be understood as representing possible approaches to further discussion. They have been developed on the basis of both participatory observation and initial exploratory studies conducted within the interdisciplinary framework of the Professorship for Information Didactics and Knowledge Transfer, and have been further refined by both authors within the subject focus of the Information Literacy Section of the KIBA and with reference to practical library-related perspectives.

## 2 Epistemic cultures, information and information didactics

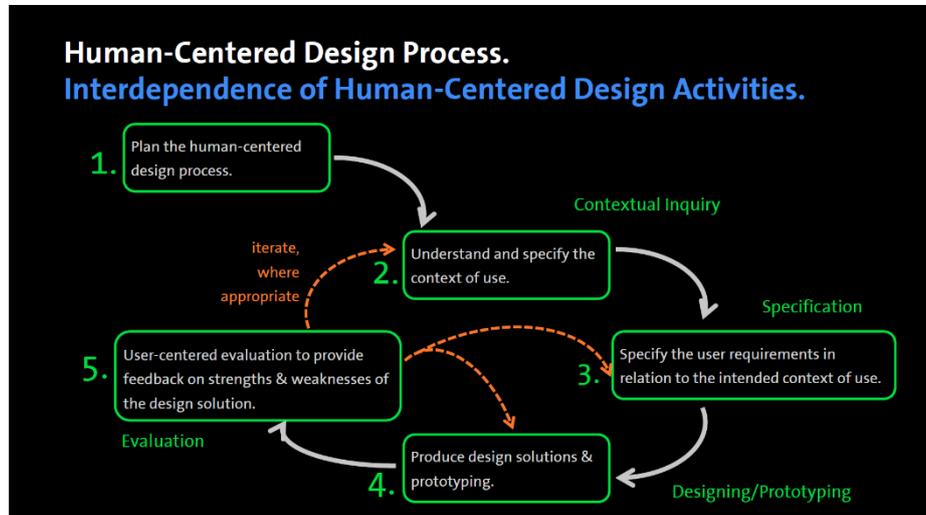
Karin Knorr-Cetina defines epistemic cultures as "practices, mechanisms, and principles that (...) determine how we know what we know within a particular field of knowledge".<sup>3</sup> So the question is: How is knowledge in a specific epistemic culture generated, validated and communicated?<sup>4</sup> From an information science perspective this approach is productive, because it provides the analytical basis for the investigation of specific processes of knowledge construction both in terms of the nature of the information generated during these processes and in terms of the information practice specific to that particular epistemic culture, in other words the testing, evaluating, processing, communicating, and sharing of information.

This approach, based on a descriptive phenomenological notion of information which looks at information from the perspective of empirical information behaviour rather than from that of the historical semantics of the concept of information, is the one followed, for example, by Capurro & Hjørland (2003) in their examination of the historical development and discipline-dependent differentiation of information.<sup>5</sup> The question regarding the particular concept of information underlying each different epistemic culture seems less relevant in the context of information didactics than the question as to what comprises information in each epistemic culture, and how information is used and processed in the various stages of epistemic culture construction. In addition information is regarded as a fluid and context-dependent concept as it undergoes the metamorphosis transforming it from data into knowledge,<sup>6</sup> whereby, according to North, data, information and knowledge are distinct categories characterized by the degree to which they are charged with meaning and context. However, the matter of what, in what context and for whom, is defined as data, as information or as knowledge is a question of cognitive interest and context. If, for example, a research project is concerned with the particular extent to which certain raw climate data have changed significantly over a certain period of time within a given region, then – set against the background of this cognitive interest and the context of this project – monthly aggregated data measuring the precipitation in a certain region are the result of the project and thus form a knowledge store. This store contains the raw climate data (=data), the interpretive selection of the precipitation measurement data obtained in accordance with the research topic (=information) and their corresponding context-based interpretation (monthly aggregation). In a second research project focusing on the question of whether monthly aggregated precipitation measurements are meaningful parameters for the description of climate change within a given region, the monthly aggregated precipitation measurement data form the starting point, and hence one of the databases instrumental in answering the question. These data are then transformed into information on the basis of, for example, their relation to other measurement parameters used to calculate climate change. The interpretive synthesis of the data evaluation with reference to the initial research question will then represent the knowledge developed within this project.

In addition to the analysis of information practices, and resulting from the fluid and context-dependent concept of data, information and knowledge described above, information didactics also includes the analysis of data and knowledge practices, thereby aiming to develop conceptual methods of promoting competence in dealing with phenomena from all three categories of the knowledge construction process.

The results of the epistemic culture-based analysis of information typology and information practice form the basis for the development of epistemic culture-specific prerequisite profiles for the design of information didactics-related models of information literacy instruction. We suggest using an example to illustrate how this praxeological perspective provides added value to a deep understanding of the epistemic culture prerequisites relating to information literacy:

As a part of the curriculum development project "Design 0815" conducted by the FH Potsdam (funded by the Stifterverband 01 / 2016-03 / 2019, Prof. Constanze Langer, Department of Design; Prof. Dr. Frank Heidmann, Department of Design; Prof. Dr. Antje Michel, Department of Information Science), the curricula of the FHP design study programs were evaluated and revised regarding the integration of learning content aimed at enabling students to participate successfully in the digitized world of life and work. At the same time, this framework offered an opportunity to actively observe the epistemic culture(s) of the design disciplines (by conducting joint courses, for example, or by cooperatively supervising bachelor theses within the common research process), and to contrast the insights thus gained with the conventions of the information science epistemic culture. A sub-project designed to provide insight into the appropriate curricular anchoring of problem-solving competencies in the design curricula led to the realization that discrepancies in problem-solving behaviour between the information sciences and the design disciplines can be characterized by differences in the way knowledge is generated. In the information sciences the dominating practice is epistemological, since it is rooted in the empirical research process, whereas in the design disciplines problem-solving behaviour is characterized by an iterative design-oriented cognition process (see Fig. 1a & 1b).



**Fig. 1a:** Human-centered design process, own graphic by FH Potsdam.



**Fig. 1b:** Research process in information science, own graphic by FH Potsdam.

Throughout the problem-solving process, agents in both epistemic cultures use different methods of generating, assessing, processing, and producing information, and many of

these methods are employed by both disciplines. However, from an epistemological point of view the two epistemic cultures pursue differing core interests. While in the information sciences the main interest lies in generating maximally generalizable, objectifiable knowledge, in the design disciplines the predominant focus is on the generation and definition of ideas, which are seen as outlines characterized by subjective inspiration.<sup>7</sup> These differing attitudes lead to similar methods being applied in different ways, with the information generated or processed with their help also being weighted differently.

For example, in both variations of knowledge generation, information retrieval is of secondary importance within the process. While in the information sciences the state of research is usually determined on the basis of an evaluation of the specialist subject literature, with value placed on proceeding in as systematic and inter-subjectively comprehensible a manner as possible, as is, for example, the case when conducting a systematic literature review<sup>8</sup> preliminary to the actual survey, information research during the design process is mainly for inspirational purposes. Subject literature is only one information research element among many other sources of information; literature research is erratic and the information often used by the researcher as a source of inspiration. Information analysis and data collection are often not separated in the design disciplines, and data collection procedures often occur in parallel, or in direct succession, at the same early stage of the design process, together with, for example, interviews with relevant stakeholders within the context of the research question, for example with future users of the product or service to be developed, or with experts. In contrast to the information sciences, these processes are generally not conducted according to social scientific principles, nor are they systematically evaluated or documented in any inter-subjectively comprehensible manner. In addition, the knowledge generated in the interviews mainly serves as inspiration, and to effect a role shift towards that of user or expert in order to cultivate a more diverse perspective on the subject.

This application of congruent methods to diverging attitudes requiring varying epistemological categorization including the resulting variations in attitude towards the generated data and information, differences in the assignment of relevance and deviations in the use of the generated data and information suggests that the teaching of information-handling skills cannot succeed using a single standard system.

The example shows that the analysis of information practices within the specific epistemic culture of a specific target group is an important prerequisite for the development of an adequate concept for the design of information literacy teaching and learning materials. While, for example, the teaching of information research techniques in the information sciences is strongly focused on systematic literature research with its ensuing phases of search strategy development commensurate with knowledge generation, careful source selection, search term documentation and systematic evaluation of the results, this kind of approach to the teaching of information research competence is applicable only to a limited extent to students in the design disciplines. For here, as a result of the very different epistemological end goal, namely that of creating ideas and designs, literature research is merely one of several elements involved in the generation

of information and data. For example, methods and tools designed to support image-guided information handling will have more significance in the design disciplines, where visual literacy training plays an important role.<sup>9</sup> Approaches to teaching literature research skills could, for example, be biased in favour of the concept of berry-picking<sup>10</sup> rather than more systematic approaches.<sup>11</sup> Other relevant methods are, for example, image searching or indeed the use of independent surveys to generate inspirational, but not systematic, impressions. It is important that any form of information literacy teaching based on the principles of information didactics be necessarily viewed from the perspective of the appropriate specific epistemic culture-based practice, resulting from the varying fundamental goals envisaged by the act of knowledge generation or the development of ideas and their transformation into drafts. If instead teachers impose standards of information handling drawn from their own professional backgrounds, there is a danger of obscuring the specific basic interest of the specialist culture – the "triggering" of inspiration, in the case of design – by employing practices and standards running counter to this interest (systematics, strictness of method, objectivity).<sup>12</sup>

It should be understood that this is an idealized viewpoint. The concept of epistemic cultures reflects more closely than the discipline of epistemology the fact that boundaries between disciplines are contingent and that there are sometimes greater similarities between two disciplines at the interfaces of common research areas than there are within a single discipline. In this respect it also should be emphasized that the descriptions of the information science and design-specific epistemic cultures presented here are to be understood as representing ideal points of view.<sup>13</sup>

However, the realization that teachers must always be familiar with the practices of their learners' epistemic culture if they are to make the information to be communicated compatible with their learners' knowledge pool is nothing new. Since the advent of cognitivist and interactionist learning theories, such as those of Lew Wygotski or Hans Aebli, this has been regarded in the didactic sciences as an essential prerequisite for the success of teaching and learning processes.<sup>14</sup> For teachers who come from the same epistemic culture as their learners, this knowledge is usually accessible as implied knowledge (tacit knowledge/tacit knowing).<sup>15</sup> In practical information teaching and learning contexts, such as in libraries for example, this is not necessarily the case. Here the teachers (for example librarians) often come from an epistemic culture different from that of their target groups. However, information practitioners can tap into the knowledge-based information practices of their target groups using an information didactics analysis. Since in daily practice it is possible to carry out this kind of analysis only to a very limited extent, we would regard the job of conducting information didactics analyses of the epistemic culture-specific information practices of our target groups as one of the more important tasks currently facing information science.

### 3 Extending the focus of information didactics

The above applies all the more given that continuing specialization and differentiation within the academic disciplines, coupled above all with the changes in information practices in the sciences triggered by digitization, pose fundamentally new challenges to the content and methods involved in the promotion of information literacy.<sup>16</sup> Even though, conceptually, information literacy has always related to all these aspects of dealing with information in a comprehensive sense,<sup>17</sup> the main emphasis - at least in the German-speaking world - has been mainly on interdisciplinary instruction in library use, introductions to catalogues and databases, and training in search strategies and search techniques.<sup>18</sup> However, in the aftermath of digitization the need is increasing for the inclusion of topics such as digital publishing, open access, research data management, and bibliometrics, thus addressing a range of complex issues related to a variety of data-related, legal, ethical, economic, and social issues.<sup>19</sup> At the moment there is general uncertainty as to how these new skills, promoted within the context of "Digital Scholarship", might relate to the skills previously taught at universities - this uncertainty also being reflected in the various approaches to systematization in which the relationship between an ever-growing and increasingly differentiated number of "literacies" is described from different perspectives in the form of hierarchically structured models.<sup>20</sup>

For information didactics, however, this somewhat theoretical systematics problem is of secondary importance. The field is primarily concerned with conveying the knowledge and skills that information practitioners in the various contexts within and without academia need in order to develop and create epistemic culture-based teaching and learning practices in all questions to do with the handling of information - understood as a "place-holder" for data - information - knowledge according to the DIK-Ladder - to suit their target groups. Information didactics competence therefore has its place within the context of both classical librarianship training and the qualification of data librarians, data stewards and other experts active in the field of digitally based learning and research processes. The curricula of the data and information-related degree courses should therefore not only be examined to check whether requirements which have arisen in the course of digitization regarding the operative handling of digital data, information and infrastructures are being adequately conveyed, but also whether these curricula are suited to providing the persons seeking qualification with the necessary information didactics skills to enable them to develop epistemic culture-based information literacy teaching and learning materials for their target groups. Linked to this are concrete information didactics research perspectives, such as the development and testing of methodological instruments for the analysis of information practice within different epistemic cultures. In conjunction with this, a further research goal could be the extension and epistemic culture-enriched differentiation of the library didactic framework model<sup>21</sup> as a guide for information science practice in libraries and other information institutions. Particular attention should be paid to the range of topics that have been added in the course of digitization, including digital publishing and open

access, research data management, and bibliometric and scientometric questions, with their diverse legal, economic, ethical and social references.

If compiled in the form of a manual, these could help experts working in information literacy to methodologically identify the epistemic culture-based specifics of their target groups and, on this basis, to develop appropriate training courses with target group-centered content and methodology, which would make a much more effective contribution to strengthening information literacy skills than that effected by methods not based on specific aspects of information practices within different epistemic cultures.

## References

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- <sup>1</sup> Ballod, M.: Informationsökonomie - Informationsdidaktik: Strategien zur gesellschaftlichen, organisationalen und individuellen Informationsbewältigung und Wissensvermittlung. Bertelsmann, Bielefeld (2017), pp. 200ff.
- <sup>2</sup> Michel, A.: Informationsdidaktik - Skizze eines neuen informationswissenschaftlichen Forschungsfelds. *Information-Wissenschaft & Praxis* 67(5-6), 325–330 (2016).
- <sup>3</sup> Knorr-Cetina, K.: Wissenskulturen: ein Vergleich naturwissenschaftlicher Wissensformen. Suhrkamp, Frankfurt am Main (2002), p.11.
- <sup>4</sup> Knorr-Cetina, K., Reichmann, W.: Epistemic cultures. In J. D. Wright (ed.), *International encyclopedia of the social & behavioral sciences* (pp. 873-880). Elsevier, Amsterdam (2015).
- <sup>5</sup> Capurro, R., Hjørland, B.: The concept of information. *Annual review of information science and technology* 37(1), 343-411 (2003).
- <sup>6</sup> North, K., Kumta, G.: Knowledge management: value creation through organizational learning. 2nd edn. (Springer texts in business and economics). Springer International Publishing, Cham (2018), pp. 34-37.; Kuhlen, R.: Information - Informationswissenschaft. Information definieren? In: *Grundlagen der praktischen Information und Dokumentation: Handbuch zur Einführung in die Informationswissenschaft und -praxis* (pp. 1–24). De Gruyter Saur, Berlin (2018), pp. 7-8.
- <sup>7</sup> Janda, V.: *Die Praxis des Designs: Zur Soziologie arrangierter Ungewissheiten*. Transcript Verlag, Bielefeld (2018).
- <sup>8</sup> Xu, J., Kang, Q., Song, Z.: The current state of systematic reviews in library and information studies. *Library & Information Science Research* 37(4), 296–310 (2015).
- <sup>9</sup> Brill, J. M., Maribe Branch, R.: Visual literacy defined – the results of a Delphi study, Can IVLA (operationally) define visual literacy? *Journal of Visual Literacy* 27 (1) 47-60 (2007).
- <sup>10</sup> Bates, M. J.: The design of browsing and berrypicking techniques for the online search interface. *Online review*, 13(5), 407–424 (1989).
- <sup>11</sup> Greer, K.: Undergraduate Studio Art Information Use: A Multi-School Citation Analysis. *Art Documentation: Journal of the Art Libraries Society of North America*, 35 (2) 230-240 (2016).
- <sup>12</sup> see also Farrell, R., Badke, W.: Situating information literacy in the disciplines: A practical and systematic approach for academic librarians. *Reference Services Review*, 43(2), 319–340 (2015); Rosman, T., Birke, P.: Fachspezifische Erfassung von Recherchekompetenz durch prozedurale Wissenstests: Psychologie vs. Informatik. In A.-K. Mayer (ed.), *Informationskompetenz im Hochschulkontext. Interdisziplinäre Forschungsperspektiven* (pp. 103–120). Lengerich: Pabst Science Publ. (2015).
- <sup>13</sup> Weber, M.: *Gesammelte Aufsätze zur Wissenschaftslehre*. 3. Auflage. J.C.B. Mohr, Tübingen (1968), pp. 190ff.

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<sup>14</sup> Aebli, H.: Zwölf Grundformen des Lehrens: Eine allgemeine Didaktik auf psychologischer Grundlage; Medien und Inhalte didaktischer Kommunikation, der Lernzyklus. 13. Aufl. Klett-Cotta, Stuttgart (2006); Wygotskij, L. S., Métraux, A., Kämper, R. (Hrsg.), Geschichte der höheren psychischen Funktionen, Fortschritte der Psychologie 5. LIT-Verlag, Münster (1992).

<sup>15</sup> Polanyi, M.: The Tacit Dimension. Routledge, London (1966).

<sup>16</sup> see Horstmann, W., Jahn, N., Schmidt, B.: Der Wandel der Informationspraxis in Forschung und Bibliothek. Zeitschrift für Bibliothekswesen und Bibliographie 62 (2) 73-79 (2015); Lynch, C. A.: Updating the agenda for academic libraries and scholarly communications. College and Research Libraries 78 (2) 2, 126-130 (2017); Jaguszewski, J. M.; Williams, K.: New roles for new times: transforming liaison roles in research libraries. Report prepared for the Association of Research Libraries. Washington (2013), <http://www.arl.org/component/content/article/6/2893>, last accessed 2019/2/13; Intersections of scholarly communication and information literacy: creating strategic collaborations for a changing academic environment. Association of College and Research Libraries (ed.). Working Group on Intersections of Scholarly Communication and Information Literacy. Chicago (2013), <http://www.ala.org/acrl/sites/ala.org.acrl/files/content/publications/whitepapers/Intersections.pdf>, last accessed 2019/2/13; Auckland, M.: Re-skilling for research: an investigation into the role and skills of subject and liaison librarians required to effectively support the evolving information needs of researchers. (2012), <https://www.rluk.ac.uk/wp-content/uploads/2014/02/RLUK-Re-skilling.pdf>, last accessed 2019/2/13; Mackenzie, A.: Digital scholarship: library services and spaces. In A. Mackenzie, L. Martin (eds.), Developing digital scholarship. Emerging practices in academic libraries (pp. 23-40). Facet, London (2016).

<sup>17</sup> see Information literacy competency standards for higher education. The Association of College and Research Libraries (ed.), Chicago (2000), <https://alair.ala.org/handle/11213/7668>, last accessed 2019/2/13; Framework for Information Literacy for Higher Education. The Association of College and Research Libraries (ed.) (2016), [http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/infolit/Framework\\_ILHE.pdf](http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/infolit/Framework_ILHE.pdf), last accessed 2019/2/13.

<sup>18</sup> Statistik Informationskompetenz. [http://zpidlx54.zpid.de/wp-content/uploads/2018/08/IK\\_Bundesstatistik\\_2017.pdf](http://zpidlx54.zpid.de/wp-content/uploads/2018/08/IK_Bundesstatistik_2017.pdf), last accessed 2019/2/13.

<sup>19</sup> cf. Tappenbeck, I.: Welche Dienstleistungen braucht die digitale Wissenschaft? Vorüberlegungen zu einer Studie über die Dienstleistungsbedarfe im Kontext von Digital Scholarship. Zeitschrift für Bibliothekswesen und Bibliographie 64 (5) 223-233 (2017).

<sup>20</sup> see FN 12 sowie Vuorikari, R., Punie, Y., Carretero, S., Van den Brande, L.: DigComp 2.0: The digital competence framework for citizens. European Commission (2016), <http://publications.jrc.ec.europa.eu/repository/handle/JRC101254>, last accessed 2019/2/13; Building digital capabilities: The six elements defined, [http://repository.jisc.ac.uk/6611/1/JFL0066F\\_DIGIGAP\\_MOD\\_IND\\_FRAME.PDF](http://repository.jisc.ac.uk/6611/1/JFL0066F_DIGIGAP_MOD_IND_FRAME.PDF), last accessed 2019/2/13.

<sup>21</sup> see Hanke, U., Sühl-Strohmenger, W.: Bibliotheksdidaktik. Grundlagen zur Förderung von Informationskompetenz. De Gruyter Saur, Berlin (2016), pp 151ff.