Institutional Repository - Research Portal
Dépôt Institutionnel - Portail de la Recherche
researchportal.unamur.be
University of Namur

RESEARCH OUTPUTS / RÉSULTATS DE RECHERCHE

How is information literacy related to social competences in the workplace?

Collard, Anne-Sophie; De Smedt, Thierry; Fastrez, Pierre; Ligurgo, Valèria; Philippette, Thibault

Published in:
Information Literacy

Publication date:
2016

Document Version
Publisher's PDF, also known as Version of record

Link to publication

Citation for pulished version (HARVARD):
Collard, A-S, De Smedt, T, Fastrez, P, Ligurgo, V & Philippette, T 2016, How is information literacy related to social competences in the workplace? in *Information Literacy: Key to an Inclusive Society.* Springer, Cham, pp. 79-88, European Conference on Information Literacy, Prague, Czech Republic, 10/10/16.

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Download date: 20. Apr. 2024

How Is Information Literacy Related to Social Competences in the Workplace?

Anne-Sophie Collard[1], Thierry De Smedt[2], Pierre Fastrez[2], Valèria Ligurgo[2], and Thibault Philippette[1](✉)

[1] Center in Information, Law and Society, University of Namur, Namur, Belgium
anne-sophie.collard@unamur.be,
thibault.philippette@uclouvain.be
[2] Groupe de Recherche en Médiation des Savoirs, Université catholique de Louvain, Louvain-la-Neuve, Belgium
{thierry.desmedt,pierre.fastrez,valeria.ligurgo}@uclouvain.be

Abstract. This article reports on a work-in-progress research on media and information literacy in teamwork and distance work environments. We introduce a theoretical framework that articulates the social and informational dimensions of media and information literacy in the workplace. Based on this framework, we propose a method for investigating the relationship between information literacy and work organization in distant teamwork. This method is illustrated by preliminary data from our ongoing research project. We conclude with a necessary redefinition of the concept of information.

Keywords: Information literacy · Digital and media literacy · Teamwork · Distance work · Social organization

1 Introduction

The digital turn in work environments involves changes in workers' media and information competences. Although competences are often linked to ideas of efficiency and performance, they also touch upon diverse dimensions of the digital turn. First, being competent is commonly seen as a factor of (e-)inclusion, not only within the organization, but also in the broader work environment, as today's collaborations within and across organizations are sustained through diverse information and communication technologies (ICT). Media and Information Literacy (MIL) [1] also has implications for well-being at the workplace: a lack of competence can create stress and frustration, and ultimately demotivation and isolation. Furthermore, ICT-supported work practices such as teleworking tend to blur the boundaries between work time and leisure time, professional life and private life, workplace and home. These new conditions also require a range of competences in order to be handled in an efficient and meaningful way. In this context, the LITME@WORK research project, funded by the Belgian Science Policy Office, proposes an interdisciplinary approach to study MIL in teamwork and distance work environments. The research team brings together sociologists and media and communication scholars to investigate the social and the individual dimensions of MIL.

© Springer International Publishing AG 2016
S. Kurbanoğlu et al. (Eds.): ECIL 2016, CCIS 676, pp. 79–88, 2016.
DOI: 10.1007/978-3-319-52162-6_8

Our research aims at providing deep knowledge on the informational, technical and social competences of workers in team and distance work environments.

Within the context of this project, this article proposes a theoretical and methodological framework for the analysis of the relationship between digital media uses and competences in new distant teamwork practices. Specifically, we examine how informational and social competences related to digital media and technology form an integrated literacy, and participate in the social construction of work organization. This work-in-progress framework is based on the literature on information literacy, digital literacy, media literacy and computer-supported cooperative work. Taking inductive approach, it is fed by data collected from interviews and observations on workers practices. This paper first explores the notion of media and information competence through a specific focus on the concept of information literacy. After presenting our method, it introduces a model crossing the different activities encountered in workers' practices and the dimensions of technology-supported distant teamwork.

2 Information Literacy

2.1 The Evolution of the Concept of Information Literacy

The concept of information literacy appeared in the 1970s in the field of library science and the context of US educational reforms [2, 3]. It was first described as a set of skills to identify one's information needs and to locate, evaluate and use information for problem-solving or decision-making [4]. Even if the concept referred broadly to work environments involving information resources, its initial application was mostly limited to libraries or private sector initiatives, such as information databanks and publishers [2]. In the 1980s, with the advent of personal computing, the concept of information literacy was used to describe the gap between the individuals who could manipulate those technologies efficiently to process, store or transmit information, and those who couldn't [2]. It therefore began to compete with others such as *Digital Literacy* or *Computer Literacy* [3], and to be used not only by librarians, but also by industry spokesmen, educators and communication researchers [5].

In the business field, information management became an important topic with the advent of information technologies [6] although, the first focus on information in this context was often limited to data management. With the development of multimedia networked information technologies, the requirements regarding traditional information skills (selection, interpretation or synthesis) extended to a broader range of data organized in systems designed to hide cues of its structure or its production context [6]. Gradually, within and outside libraries, the focus shift from specific text-based contents to a variety of sources [7, 8]. Information literacy also evolved beyond issues of information access, management or transmission, to include content creation skills [1]. Gradually, from being able to use various existing information systems, the information literate users came to be defined as capable of adapting themselves to their changing information environments. Considering information literacy as a set of survival skills feeding a lifelong learning process, some authors stressed the necessity to link information literacy to understanding, meaning and (learning) context [3, 9]. More broadly, mass media

analysts started to use the concept as well, to point to people's ability to liberate themselves from the institutionalized discourses of mass media [2]. In brief, the evolution in the use of the concept suggests a transition from procedural capacities in specific contexts (such as libraries) towards more general and adaptive competences and social participation or citizenship [3].

2.2 Information Literacy as Competences and Practices

Lloyd [10] argued that being information literate is not limited to possessing a set of fixed information skills, but also include mastering the information landscape. Therefore, information literacy can be defined as a socially situated information practice [10], involving "lifelong learning and professional development, and the ability to interact in the information society" [11]. While we agree that information literacy cannot be limited to a set of operational skills, we believe in the value of defining it as a set of competences. Shifting from skills to competences has the benefit of establishing a straightforward relationship between literacy and practices.

The concept of competence emerged as an attempt to reduce a gap between qualifications, defined as a set of techniques and know-hows recognized by a degree or a certification [12], and the reality of the job. The competent (as opposed to qualified) worker is able to "manage a complex professional situation" [13]. Rey [12] mentioned four inherent properties of the concept of competence: (1) the adaptability it confers to a person, allowing her to face unexpected situations efficiently; (2) its singularity which connects it to the personality and the history of the person; (3) the fact that one cannot observe a competence directly, but only its effects through the performance of an activity, and (4) the fact that it exceeds the simple possession of knowledge and know-hows to include the capacity to call upon them selectively to act in relevant ways in novels situations [14].

Based on this definition, the relationship between competences and practices can be described as follows. Practices are situated performances that are shaped by the affordances and constraints of the material and social resources of the site in which they unfold. Practices make the individual's competence manifest: her ability to make relevant use of the material and social resources of the novel situations she finds herself in, along with her own knowledge and skills. In this sense, information literacy can be interpreted both as a set of competences and as a set of situated practices.

2.3 Information Literacy as an Individual and Collective Accomplishment

In the analysis of complex socio-technical arrangements such as new work environments, where technologically-mediated teamwork and distance work have spread widely [15], the concept of information literacy cannot be limited to individual competences. While the ability to search, evaluate, produce, or organize information are often implicitly considered as skills of the individual, it is also necessary to take the collective dimension of information literacy at work into account [16, 17]. Considering information as endowed with meaning by users, and their management as a process of knowledge

creation [6], we include both the individual and the social construction of information in the definition of information literacy.

3 Research Goals and Method

We consider information literacy as an integrated set of informational, technical and social competences [18, 19] that underpin workers' collective activities. This theoretical stance is complemented by a methodological position that leads us to unveil the (individual and collective) information literacy of workers by studying their distant teamwork practices, which we view as a set of socially constructed and situated collective practices that make their competences apparent.

Our research aims at highlighting how our informants' informational work practices are not valuable in themselves but only in relation to the social organization they contribute to elaborate. We consider information literacy to be social in at least three ways: (1) it relies on social relationships and organization as resources for its expression and development, (2) it shapes social relationships and social organization, and (3) it is (at least in part) a collective accomplishment.

Specifically, we intend to examine the interdependencies between information literacy (considered as individual and collective competences) and the functioning of the team in distant (technologically mediated) teamwork practices; and between the informational and the social dimensions of the practices (and hence the competences).

The objective pursued in the LITME@WORK project is the very definition of the competences called for and developed by ICT-supported distant teamwork practices from the perspective of workers, based on field observation. We interview office workers about their practices and make observations in their work environments [20–22]. We have selected ten case studies of Belgian organizations involved in projects changing the way employees work in team and at a distance. Forty workers and twenty team managers will have been interviewed by the end of the study. The next section presents the structure of our main observation instrument: our interview guide. We will subsequently use data from preliminary interviews to illustrate how this instrument allows us to pursue our research goals.

3.1 Data Collection Method

Our interview guide is structured around a set of work activities related to distant teamwork. These activities were identified by reviewing the computer-supported cooperative work (CSCW) literature [23–26], which provides abundant observational research on collaborative work practices, aimed at designing novel (or redesigning existing) tools to better assist users in these practices. All of these technology-supported collaborative activities involve both social interaction between team members, and the mediation of technological apparatus, and are a potential venue for the expression of information literacy competences. We hypothesize the observed teams will vary in terms of the

relative importance and complexity of these activities, thereby determining how information literacy can affect teamwork practices and work completion (and vice versa). The selected activities are:

1. Authoring a document collectively;
2. Sharing a collection of documents;
3. Managing outgoing information;
4. Managing incoming information;
5. Using others to find information;
6. Making collective decisions regarding task distribution, team governance and roles, and overall team functioning;
7. Managing one's tasks in relation with others;
8. Planning a meeting;
9. Planning the team's activity;
10. Working synchronously in the distance with other team members;
11. Organizing one's workspaces for collaboration.

Each of these eleven activities is further detailed into up to eight dimensions of technology-supported distant teamwork, which are systematically accounted for in our interview guide. These dimensions allow for a fine-grained analysis of how workers are able to perform these activities. The necessary redundancy between activities and dimensions accounts for the intricate relationships between the technologically-mediated activities of distant teamwork. These dimensions are the following.

1. **Task management**. At the team level, it consists in the technologically-mediated management of the distribution of work activities among team members and their articulation [27]. At the individual level, it involves the use of technology to adjust one's task execution to the others' activities.
2. **Time management** touches upon how team members make use of technology to manage the time allocation, frequency, scheduling, and synchronicity of both the team's activity and the individual's activity in relationship to the team [31]. It includes the management of interruptions [32]: both when one interrupts others, and when one is accessible and can be interrupted by others [33].
3. **Space and distance management** is the management of the spatial properties of one's work environment at different scales: the spatial layout of one's local digital workspace [37], the proxemics of one's work place (for example who is working closest to whom), and the separation between work sites in teleworking [38].
4. **Information management** includes collective digital information production, as well as individual information authoring for the team, and information sharing (including the timing of sharing, the organization of shared resources, and the management of accesses to shared information). While the individual management of personal information has been extensively studied [21, 22, 28, 29], the individual management of shared information has garnered less attention [30].
5. **Awareness** is the understanding of the activities of others, which provides a context for your own activity [34]. Schmidt [35] highlighted how awareness was as a (too) broad concept that spans from a general awareness of the respective knowledge, expertise and social standing among team members, and of their respective location

and availability (or social awareness [36]), to a more specific awareness pertaining to tightly coordinated team activities, namely the practice and ability to coordinate by monitoring others as well as making one's own activity visible to others.

6. **Collective decision making** corresponds to the processes through which collective decisions are made with the support of information technology [39].
7. **Reflexive tool use** is one of two "meta" dimensions that involve the individual's ability to not only use information technology, but also reflect on the way information technology affects their work. It includes identifying one's technological needs, knowing how the affordances of different technologies meet them, selecting tools accordingly, appropriating them [40], and assessing their efficiency.
8. **Comprehension of "sociomatics"** is the second "meta" dimension. Contemporary information technology goes beyond the automatic processing of information (informatics), to encompass the automatic processing of social interactions (which we call "sociomatics"). The comprehension of sociomatics is the understanding the individual has of the social entailments of technology use. Examples include understanding how the choice of one tool for sharing information impacts access to information for each team member; or understanding how one's activity is visible to different people and how others can negotiate access to one's time through the use of a given tool [41].

3.2 Examples of Practices of Collective Authoring

As it is not possible to provide a detailed description of each dimension for each activity within the scope of this article, we will illustrate these dimensions for one activity: the collective authoring of a document (activity #1), with examples taken from two interviews from the exploratory phase of our data collection. These data are too scarce and anecdotal at this point to yield any result regarding the definition of media and information literacy in distant teamwork and its relationship to team functioning. Yet they allow us to showcase how our interview guide points to the (potential) role of information literacy in distant teamwork. Our first informant, whom we will call Oliver, coordinates a team of advisors in a vocational guidance center. Our second informant, whom we will call John, is a project coordinator within a research unit.

As far as task management is concerned, both teams manage the task of collective authoring sequentially. Collectively authored documents are created by one team member, who places it either on a shared network drive (Oliver), or a cloud-based storage volume (John), and works on it individually, before notifying another team member that they can contribute. Hence, from the perspective of time management, collective authoring only happens asynchronously. Regarding space and distance management, the socio-technical arrangements of both teams exclude the possibility of synchronous distant collaborative authoring: if team members need to co-author a document synchronously, they just work together on the same computer. On the other hand, asynchronous co-authoring is made possible by the shared distant storage of documents, irrespective of the distance at which team members work.

Information management differs between the teams. On Oliver's team, the network drive that hosts the shared documents is equally accessible to all team members. The

location of the document on the drive, its name and possible shortcuts, all follow rules that were decided collectively by the team. On John's team, the visibility and accessibility of each sub-folder and document is managed by the document or folder creator, depending on rights that were defined by their IT department.

Regarding awareness, Oliver's team members are notified they can work on the collective document by email or by face-to-face communication. They typically send a link to the document on the shared drive (instead of sending attachments that could overload their email server). John's team uses either emails or phone calls for such notifications, but to a lesser extent, as they expect coworkers to check whether the document has been edited (and by whom) on the cloud service's notification system.

As far as collective decision making goes, when collective authoring comes to an end in Oliver's team, the co-workers expect the team to agree on the final version, and to subsequently archive or delete the old versions files, but the cleanup is not always completed. In John's team, for each document, the final decision is the responsibility of one person (usually the project manager) who validates the final version.

The team members' reflexive tool use does not always appear clearly. When they contribute to a collective document, Oliver's team members either use Microsoft Word's revision mode, or create successive versions of the file with different names. It is unclear whether the respective uses of revision mode and file versioning is the result of a collective decision (with a preliminary reflection on the respective merits of these two affordances), of the sum of individual habits and competences, or of random contextual factors. Each of these situations would correspond to a different level of collective or individual literacy (from the highest to the lowest level). Future interviews will investigate this issue in further details. By contrast, the way their shared drive is organized was adopted as a result of collective trial-and-error practices, through which the team seems to have increased its collective information literacy.

Finally, the comprehension of sociomatics concerns the team's ability to balance the access to a maximum of shared resources and the ability to find previously produced documents. While John's team practices limits who has access to what, Oliver's team members, who have access to the whole shared drive, rely on their coworkers' support when they fail to find documents. Such occasions of failed document retrieval remind the team members that their shared server needs to be "cleaned" from old useless versions of finalized documents.

4 Conclusion and Perspectives

The concept of information literacy has evolved from a "documentary" perspective to a broader "generalist" approach. The information literate person is neither a librarian nor a library user, neither a student, nor a researcher, but an ordinary average worker.

Media and information literacy, taken as independent variable, appears to be the condition under which the use of information technology becomes good enough to ensure the development and performance of the individual and/or the team at work. In other words, the information literate worker is able to produce, retrieve and process information critically, relying on the workplace affordances and constraints. Their

informational practices enable efficient collective activity, and contribute to the constitution, maintenance and evolution of the organization, and to the fulfillment of its missions. As it empowers the worker to fully participate to the existence of the organization, information literacy contributes to social inclusion.

Information literacy only develops in concrete circumstances, highly dependent on the technological and anthropological environment within which the individuals are collaborating. The definition of literacy is therefore variable in quality (to what type of acts does it extend?), and in terms of levels (what is the degree of difficulty of these actions?). In this article, we proposed to measure these two orders of differences using a dual approach. The first step is to build an abstract grid of eleven activities by eight dimensions of technology-supported distant teamwork, allowing for detailed accounts of the intricate ways in which the collaborative activities of teams call upon both social relationships and technical affordances of media devices. The second step consists in conducting case studies in a sample of organizations practicing distant teamwork. Based on the results of observations and interviews, our goal is to draw a map of the intensity, frequency and complexity with which the individual and team act upon the technical affordances of media available to them to achieve the socio-informational functions (at large) that allow a due performance of their activities.

But defining and identifying the media and information literacy of people working remotely in teams cannot be reduced to producing a quantified inventory of the skills of workers. The research presented in this article, although it is not yet completed, already suggests at least two new theoretical issues affecting the concept of information.

The first issue arises from the acknowledgment that the "informational" exchanges between workers are crowded with things that, in reality, are not information, but communicative acts with pragmatic incidences on the way the members of the team are working together. The question is: what is the standing of the competences related to the practices of social regulation between the members of a team within a model of media and information literacy? How can one analyze, in terms of competences, the expressions of support, divergence, feelings, complicity or irony that are present in the uses of media and technology, but cannot be accounted for by the concept of information?

The second theoretical issue also calls the scope of the concept of information into question. It emerges as researchers consider the collective management of collections of data by a team. The ensuing observations unequivocally suggest to adopt the postulate that any information is information for someone. This implies that there is no information independently of a community of people who regard it as having a meaning, a purpose - albeit potential - and who dedicate themselves to secure its existence and accessibility, through shared memory or shared media. It is consequently necessary to redefine the concept of information itself, by adding to it a new property: the designation of the people or the communities that produce, acquire, use, secure and share it because they hold it to be relevant. Hence, information, in its generic form, does not only define the combination of a predicate to a subject (two-dimensional concept). Information, in the renovated sense, combines a predicate to an object by specifying for whom (three-dimensional concept).

References

1. Moeller, S., Ammu, J., Lau, J., Carbo, T.: Towards media and information literacy indicators. Background Document of the UNESCO Expert Meeting, Bangkok, Thailand, 4–6 November 2010. UNESCO, Paris (2011)
2. Behrens, S.J.: A conceptual analysis and historical overview of information literacy. Coll. Res. Libr. **55**, 309–322 (1994)
3. Bawden, D.: Information and digital literacies: a review of concepts. J. Doc. **57**, 218–259 (2001)
4. Koltay, T.: The media and the literacies: media literacy, information literacy, digital literacy. Media Cult. Soc. **33**, 211–221 (2011)
5. Demo, W.: The idea of "information literacy" in the age of high-tech (1986). http://files.eric.ed.gov/fulltext/ED282537.pdf
6. Mutch, A.: Information literacy: an exploration. Int. J. Inf. Manag. **17**, 377–386 (1997)
7. Doyle, C.S.: Information literacy in an information society: a concept for the information age. Diane Pub. Co., Darby (1994)
8. Snavely, L., Cooper, N.: The information literacy debate. J. Acad. Librariansh. **23**, 9–14 (1997)
9. Ambach, G.M., Bainbridge, W.L., Breivik, P.S., Eaton, J.S., Imig, D., Kilgore, S., Kuhlthau, C., Mika, J., Miller, R.D., Rogers, S.J., Wedgeworth, R.: Presidential Committee on Information Literacy: Final Report. American Library Association, Washington, D.C. (1989)
10. Lloyd, A.: Trapped between a rock and a hard place: what counts as information literacy in the workplace and how is it conceptualized? Libr. Trends **60**, 277–296 (2011)
11. Kirton, J., Barham, L.: Information literacy in the workplace. Aust. Libr. J. **54**, 365–376 (2005)
12. Rey, B., Carette, V., Defrance, A., Kahn, S.: Les compétences à l'école: Apprentissage et évaluation. De Boeck, Bruxelles (2012)
13. Le Boterf, G.: De la Compétence à la Navigation Professionnelle. Editions d'Organisation, Paris (1997)
14. Le Boterf, G.: De la compétence: Essai sur un attracteur étrange. Editions d'Organisation, Paris (1994)
15. Bruce, C.S.: Workplace experiences of information literacy. Int. J. Inf. Manag. **19**, 33–47 (1999)
16. Lloyd, A.: Working (in)formation: conceptualizing information literacy in the workplace. In: Proceedings of 3rd International Life Long Learning Conference, pp. 218–224. Central Queensland University Press, Rockhampton (2004)
17. Crawford, J., Irving, C.: Information literacy in the workplace: a qualitative exploratory study. J. Librariansh. Inf. Sci. **41**, 29–38 (2009)
18. Fastrez, P.: Quelles Compétences le Concept de Littératie Médiatique Englobe-t-il? Une Proposition de Définition Matricielle. Rech. En Commun. **33**, 35–52 (2010)
19. Fastrez, P., De Smedt, T.: Une Description Matricielle des Compétences en Littératie Médiatique. In: Lebrun-Brossard, M., Lacelle, N., Boutin, J.-F. (eds.) La Littératie Médiatique Multimodale. De Nouvelles Approches en Lecture-écriture à l'école et hors de l'école, pp. 45–60. Presses de l'Université du Québec, Québec (2012)
20. Malone, T.W.: How do people organize their desks?: implications for the design of office information systems. ACM Trans. Inf. Syst. **1**, 99–112 (1983)
21. Barreau, D., Nardi, B.A.: Finding and reminding: file organization from the desktop. SIGCHI Bull. **27**, 39–43 (1995)

22. Boardman, R., Sasse, M.A.: "Stuff goes into the computer and doesn't come out": a cross-tool study of personal information management. In: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pp. 583–590. ACM, New York (2004)
23. Olson, G.M., Olson, J.S.: Research on computer supported cooperative work. In: Helander, M.G., Landauer, T.K., Prabhu, P.V. (eds.) Handbook of Human-Computer Interaction, pp. 1433–1456. North-Holland, Amsterdam (1997)
24. Olson, G.M., Olson, J.S.: Collaboration technologies. In: Jacko, J.A. (ed.) Human Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd edn, pp. 549–564. CRC Press, Boca Raton (2012)
25. Grudin, J., Poltrock, S.: Taxonomy and theory in computer supported cooperative work. In: Kozlowski, S.W.J. (ed.) The Oxford Handbook of Organizational Psychology, pp. 1323–1348. Oxford University Press, New York (2012)
26. Grudin, J., Poltrock, S.: Computer supported cooperative work (2013). https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/computer-supported-cooperative-work
27. Schmidt, K., Bannon, L.: Taking CSCW seriously. Comput. Support. Coop. Work CSCW **1**, 7–40 (1992)
28. Jones, W.: Keeping Found Things Found: The Study and Practice of Personal Information Management. Morgan Kaufmann, Burlington (2008)
29. Jones, W., Teevan, J. (eds.): Personal Information Management. University of Washington Press, Seattle (2007)
30. Zhang, H., Twidale, M.: Mine, yours and ours: using shared folders in personal information management. In: Proceedings of the PIM 2012 Workshop. ACM Press, Seattle (2012)
31. Blandford, A.E., Green, T.R.G.: Group and individual time management tools: what you get is not what you need. Pers. Ubiquit. Comput. **5**, 213–230 (2001)
32. O'Conaill, B., Frohlich, D.: Timespace in the workplace: dealing with interruptions. In: Conference Companion on Human Factors in Computing Systems, pp. 262–263. ACM, New York (1995)
33. Reder, S., Schwab, R.G.: The temporal structure of cooperative activity. In: Proceedings of the 1990 ACM Conference on Computer-Supported Cooperative Work, pp. 303–316. ACM, New York (1990)
34. Dourish, P., Bellotti, V.: Awareness and coordination in shared workspaces. In: Proceedings of the 1992 ACM Conference on Computer-Supported Cooperative Work, pp. 107–114. ACM, New York (1992)
35. Schmidt, K.: The problem with 'awareness': introductory remarks on 'awareness in CSCW'. Comput. Support. Coop. Work CSCW **11**, 285–298 (2002)
36. Tollmar, K., Sandor, O., Schömer, A.: Supporting social awareness @ work design and experience. In: Proceedings of the 1996 ACM Conference on Computer Supported Cooperative Work, pp. 298–307. ACM, New York (1996)
37. Kirsh, D.: The intelligent use of space. Artif. Intell. **73**, 31–68 (1995)
38. Olson, G.M., Olson, J.S.: Distance matters. Hum-Comput. Interact. **15**, 139–178 (2000)
39. DeSanctis, G., Gallupe, R.B.: A foundation for the study of group decision support systems. Manag. Sci. **33**, 589–609 (1987)
40. Dourish, P.: The appropriation of interactive technologies: some lessons from placeless documents. Comput. Support. Coop. Work CSCW **12**, 465–490 (2003)
41. Hollan, J.D., Stornetta, S.: Asynchronous negociated access. In: McDonald, S., Waern, Y., Cockton, G. (eds.) People and Computers XIV - Usability or Else: Proceedings of HCI 2000, pp. 17–26. Springer, London (2000)