Instrumented analysis method for collaboration activities

Samia Ben Rajeb and Pierre Leclercq
University of Liege
LUCID Lab for User Cognition & Innovative Design
Liege, Belgium
e-mail: samia.benrajeb / pierre.leclercq @ ulg.ac.be

Abstract— **Analysing collective design activities is a difficult task, especially in a context that involves the remote collaboration and/or multidisciplinarity. It is thus necessary to define a dedicated analysis process, instrumented by tools that can facilitate the data acquisition and visualization. The method presented here enables to cross-reference the two aspects of a complex collective activity: the process and the content treated by a group. Our method offers the possibility to analyse different types of collective work configurations (co-attendance or remote / instrumented or not). Its flexibility leaves the possibility to the researcher to update his frame and thus avoid the preconceptions earlier defined before the activity without possibility to reconsider.**

Keywords-collaborative design; methodologies and tools for collaborative activity analysis; visualization of collaborative processes.

I. INTRODUCTION

Collective activities have been the object of much research in psychology, ergonomics, and cognitive science that aim to create models for this kind of complex interaction [1]. These are based on two models of synchronisation: the first is cognitive synchronisation, relating to the construction of a context of shared knowledge; the other is operational synchronisation, relating to the division of tasks of the different collaborators [2]. These synchronisations aim to build awareness that will enable collaborators to interact with their environment and with a group of actors [3]. The place of the common ground is primordial because it contributes to the sharing of each one's specific competence and the acquisition of new competences to work in groups [4]. Other research has also highlighted the complexity of these activities because they can be different depending on the number of actors [5], the aim of the activity [6], the space and the time during which these interactions take place [7].

For the diversity of configurations involving several actors, supports (which can be specifications of tools as well as the organisation of on-going work groups) have been proposed in the context of the scientific field of Computer Supported Cooperative Work (CSCW) and, more precisely, of the Computer Support for Cooperative Design (CSCD, focussing on collective design activities).

In this context, the framework of our study only concerns the design meetings, held in co-presence or remotely, between different actors (architects, engineers, or designers) who are collaborating on the same project (and not coordinating, for example). This phase is that of the emergence of ideas that evolve corresponding to the interactions and graphic representations that are produced and shared. It is so much more difficult to observe and analyse when they take place at a distance. The analysis of this complex collaborative activity interests us because it raises several methodological questions for the researcher, in terms of the methods of collection, treatment and analysis of data, which we will develop in this article.

Our goal consists of designing an operational method to analyse the process of any complex collaborative activity, to code efficiently the gathered data and to assist in their analysis. As opposed to classical protocols and existing tools, we aim to use real time data collection (in addition to video support that usually requires from 3 to 10 times the duration of the observed activity), a flexible coding frame, which allows to adapt the coding variables and analysis criteria, and a agile visualisation tool, which can help the interpretation work, using dynamic graphs and diagrams.

This paper will first present a short state of the art on understanding collective activities (section II) and a description of our research context and our application framework (section III). The section IV will describe our process for analysing collaboration activities and the COMMON Tools support. Finally, the conclusions will emphasize the flexibility of our instrumented method and trace some perspectives.

II. STATE OF THE ART AND QUESTION OF RESEARCH

A. Understanding collective activity and gathering data

Since the 90's, many research projects have aimed to promote and aid collective activity. In a synthetic manner, one can distinguish [6][8]-[11]: those that try to categorise and define collective activity; those that concentrate on the technical aspects of this activity; those that focus on the social aspects; those that deal with developing man-machine interfaces and others man-man interfaces to help collaboration; those that develop methods and tools to analyse this complex activity in their real context or in the laboratory.

Focussing on this last aspect to understand collective activity from the research point of view, one of the main methods of gathering and treating data to analyse situations of collaboration is the "Protocol analysis" [12], which generally takes place in controlled environments. "Protocol analysis" is based on two methods of gathering data that can, separately, produce similar results for coherent

 ISBN: 978-1-61208-436-7

understanding of the problem-solving process and can also be complementary depending on the research objectives [13].

"Retrospective protocols" consist of asking the operator, after having finished his activity, to choose representative elements of his activity and then to describe them in order to better define the specificities of his work, alone or within a group. Thus, it concerns the study of design objects and their components independently of the situations in which they evolve [12]. In our opinion, this approach contributes to changing the designers' point of view of their design object by asking them to conceptualise their activity by calling on their memory. It has nevertheless been shown that if the stored information calls on short-term memory, the cumulative data can provide important details related to the research question [10] and the origins of choice to solve one problem or another [14]. Self-confrontation can also be another approach to analyse a task already completed. It consists of asking an operator to realise a self-examination of his own work process (alone and/or with others) from filmed sequences of his activity [15]. But, in our opinion, this other method demands that the operator make a big investment in terms of time and involvement in the research.

"Concurrent protocols" consist of the operator verbalising orally out loud his thoughts while working on a specific task (like the "think aloud" [16]). His thoughts are then transcribed, coded, and analysed by the researcher. This approach comes from the hypothesis that the verbalisation of thoughts during the process of problem-solving does not affect the process [12]. Other researchers do not agree with this hypothesis and think that the "retrospective protocols" are less intrusive in the process since it is put into play once the activity is finished [17]. But, in the context of collective activity, the actors naturally find themselves in the obligation of speaking and verbalising their thoughts in order to collaborate. In this way, the "concurrent protocols" make sense, in our opinion, because it is closer to the real work conditions and the context. Taking into account the context where the activity takes place reinforces the ecological validity of the observations and does not exclude the social process, the team work and the communication which make up the daily work.

B. Choose an approach and define its analytical steps

The methodological approach for the analysis and treatment of data are all the more varied and can result in qualitative or quantitative results. To reach a certain degree of precision in data processing, these methods are generally based on a segmentation system that, according [14], can be slanted according to two approaches.

• "Process-oriented segmentation": this approach cuts the process into several sequences relative to the actors' intentions and identifies the time spent for each of these sequences, as well as the correlation between them. According to [18], the COMET method for example [11], allows one to describe the principal identification phases and argumentation of a problem. As for the coding table developed for the specific analysis of the comparison of the points of view in concurrent engineering, it enables one to draw up a tree diagram of propositions and verbal interactions between the collaborating actors [19]. The analysis by the word-processing software ALCESTE [20] enables, moreover, to structure the information put into play and shared by the actors to solve a problem. Even though all these methods are complementary, this "Process-oriented segmentation" approach is sometimes criticized because it does not look closely enough at the contents, that is, the problem treated by the actors during the activity, the documents and annotations that are produced [21].

• "Content-oriented segmentation": this approach enables one to complete the first as it looks specifically at the visual contents (representations, annotations, references, artifacts, etc.) and examines the cognitive interactions between the designers and the artifacts [15]. One of the best-known methods is that of Gero [22], which is based on a principle of encoding, called FBS, depending on the functionality of the object ("Function"), the behaviour of the actors ("Behavior"), and the structure of the collaboration ("Structure"). In this way, the author formulates the design as a series of transformations of the model's functions. Brassac & Gregori [23] propose a clinical approach that looks at the real activity and its different interactions, by studying the discursive productions, the gestures, the graphical representations and the conversational sequence. In our opinion, this approach enables one not only to hierarchize the acts of language, by breaking them down into sequences and sub-sequences, but also to illustrate the conversational dynamic between the collaborators [23]. In the same way, being based on ethnographical studies, Boujut & Laureillard introduce themselves directly into real industrial context and propose methods of "research-action", analysing this framework and introducing new tools to aid the collaboration [24].

Faced with this variety of methods, our approach is clearly placed in the "concurrent protocols" that look at the process, both at the evolution of the process and in the time ("process-oriented segmentation"), and at the different interactions between the actors, as well as the design project that is treated ("context-oriented segmentation").

The difficulty lies in the context of our research. In fact, our analyses concern the collective activities (in co-presence and/or remotely) that take place: (1) either in a professional context that does not allow, for reasons of confidentiality, to gather the audio data and/or videos to treat and analyse them afterwards, (2) or in a pedagogical context of project realisation over an entire semester involving students, teachers, and experts (substantial, complex and difficult-to-analyse data). In our opinion, it is a question of studying the ensemble of these interactions (oral and graphical) with the objective of describing the process of negotiation and making collective decisions. This description takes places, in our method, in a qualitative manner and is also supported by the visualisation of the quantitative data looking into the many criteria that play a role in the specification of the collective activity.

 ISBN: 978-1-61208-436-7

III. RESEARCH CONTEXT AND APPLICATION FRAMEWORK

A. Research context

This research project fits into the framework of the ARC (Actions de Recherche concertée) program. This program is financed by the Walloon-Bruxelles Community and involves the multidisciplinary consortium COMMON (Natural Multimodal Mediatised Collaboration), which groups about fifteen researchers from five departments of the University of Liège: engineering sciences (LUCID, Lab for User Cognition and Innovative Design, that coordinated the scientific program), linguistics and semiotics (Science of Language and Rhetoric), work psychology, and cognitive sciences (LECIT, Laboratory of Cognitive Ergonomics and Intervention in Work), architecture (Architecture and Society) and medicine (Systematic Human Anatomy) [25]. Being spread over four years (2011-15) the objective of this research project focussed on the analysis of multimodal characteristics of collaboration and verbal and non-verbal exchanges in complex activities. To answer this question, the consortium put in place a method of analysis of collaborative practices that are presented in this article based on multiple observations and real practices, articulating quantitative with qualitative ones.

B. Application Framework

We have applied this method to analyse different configurations involving co-presence and remote meetings that bring together varied actors in "training by projects" contexts and in professional contexts (cf. Figure 1).

Figure 1. Examined configurations: freehand collaboration vs instrumented work / remote collboration vs co-attendance meeting.

Focussing on complex collective activities and, more specifically, on collaborative design activities, we have examined fields of architecture as well as engineering, design and ergonomics. The variety of analyses on the quantity of gathered data were privileged because it is difficult to observe complex collective activities in detail, even taking place in a limited lapse of time. Our gathered data vary between four hours in professional contexts to several months in the "training by projects" framework. We have also privileged situations grouping a limited number of participants (between 2 and 5 participants) to get a finer understanding of the activity. Focussing on the integration of new technology being used in these collective activities, certain analysis (mostly the remote ones) involved the use of an innovative system called Collaborative Digital Studio. This system associates 3 elements: video-conferencing (enabling geographically distant collaborators to see each other and to discuss remotely in real time), a digital table using an electronic pen (by which collaborators can interact graphically via an electronic pen), and a graphic interaction software called SketSha [26]. Developed in the LUCID Laboratory of the University of Liège, this allows remote collaborators to share documents (sketches, plans, pictures, technical drawings and texts) and to interact graphically in real time [27].

IV. ANALYSING DATA PROCESS

Fitting into the "concurrent protocols" method, we have tried to grasp the particularities of collective activity put to work in real social contexts to try to help them. To do this, we defined a group of criteria put forward in our state of art and that focus as well on the project as the design object itself. The criteria we examined here concern: the actions put into play by each actor, their typology and their evolution over time, the work spaces involved and the passage from one to another, the documents used and the kinds of annotations produced, the evolution of the shared design object in terms of the degree of abstraction and the degree of grasping. These criteria are important to define before beginning because they contribute to fixing the observation protocol and gathering data as well as the treatment and its analysis that takes into account: (1) time, (2) the role of each actor and his work space, and (3) the implications of these interactions in the evolution of the object to be designed.

A. Observation

To carry out the data gathering during an activity, two methods can be put to work. The first concerns the video recording that was applied in the "training-by-projects". These videos were captured according to two focal lengths: a wide angle (centered process) to film all the scene of the interaction between the actors and a narrow angle (content-centered) on the work surface to film all the artifacts and annotations put into play during collaborative work.

The second, which demands more preparation before the observation, concerns rapid note-taking. To do this, observers that were trained in this method in advance (between 3 and 4 researchers per situation) receive different observation methods to which are attached pre-constructed tables according to the theme of the data:

- Theme 1. Observe the collaboration: list established according to time landmarks, interactions of designers and their work spaces (I-space, We-space, Space-between [28]), documents used and representations realised during the process; counting possible emotions explicitly expressed.
- Theme 2. Observe the design: following the design process and the artifacts that are created or shared by the designers (parts of the project concerned by each action, documents used and/or created) and listing analogies and references put to work.

 ISBN: 978-1-61208-436-7

• Theme 3. Observe freely: qualitative tracking, always in relation to time, of the evolution of the object conceived and negotiated in the group, tracking key moments and particular uses of tools used during the design process.

This list of chronological actions and their modalities can be completed in real time by the observers, thanks to this rapid note-taking form.

B. *Treatment*

During this phase, the temporal point of reference takes on its importance. All gathered data are first synchronized then coded according to the criteria cited above from the note-taking. A common description of the collaborative process is then constructed in the form of actions based on a consensus between the different observers. By putting each action into words, the observers cut the activity into moments of interactions that they then code in relation to the categories defining the collaborative process and that of design. This division is made via a coding frame (cf. Figure 2).

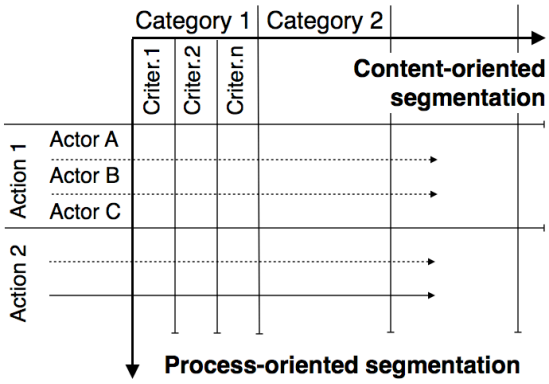

Figure 2. Process-oriented vs content-oriented segmentations.

This frame divides the activity vertically, according to the temporal point of reference in order to describe the process ("process-oriented segmentation"), and horizontally following the predefined categories of analysis in order to describe the content and the specificity of each action ("content-oriented segmentation") defined according to the following categories: type of action, concerned space of work, documents used, representations created, degree of grasping and degree of the object's abstraction, manifested emotions, etc. The process-oriented segmentation and the data of the content-oriented segmentation are written in a differed time frame, after the observation phase, by mixing the points of view of observers and observed collaborators, in one common and unique coding Excel file.

C. *COMMON Tools*

After their synchronization and coding, the data is then treated in COMMON Tools (CT). CT is a web platform initiated in the framework of the ARC COMMON project and developed by LUCID of the University of Liège. It was made available to the researchers enabling the transformation of the data from the coding frame (in the .csv or .xls files) into consolidated data then quantified and translated according to different choices of visual formalisms (pie, stacked columns, time line, crossing, clouds, etc. This tool offers researchers a tool for visualizing data in order to analyze the collective design activity in the form of a panel of interactive graphics (generating multiple graphs per analysis-type). It enables one to visualize the crossing of data treated in relation to time, occurrences and the specificities of each actor involved in the collective design process (cf Figure 3).

By comparison to other usual visualisation tools (like Excel for example), CT offers a crossed data representation, which allows to observe concomitance of two variables (cf. Figure 4) and a of timeline representation, with dynamic functions to zoom in a particular duration of time along the observed process (cf. Figure 5).

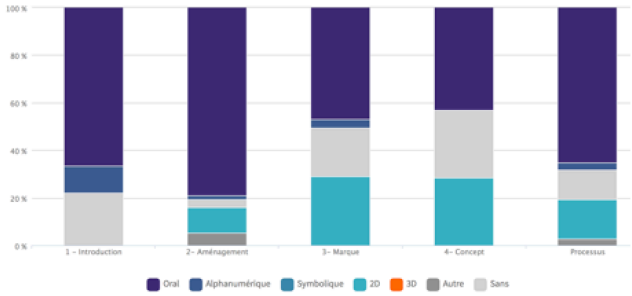

Figure 3. Example of visualizations proposed by the COMMON Tools : types of used representations in five steps of the observed process : oral / written / symbolic / 2D / 3D / others / none.

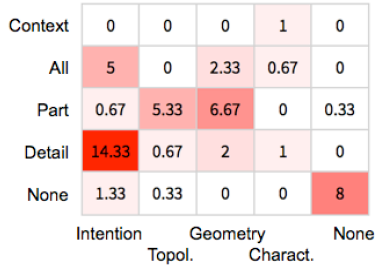

Figure 4. Example of visualizations proposed by the COMMON Tools : collective object characterization
(crossing level of abstraction / level of grasping)

Let's give two result examples that has been brought thanks to this analysing process using the COMMON Tools.

It has been possible for us to show the importance of space management in the collaborative process between the designers. In fact, it has been shown that the group cohesion is favored by the enhanced spaces offered by the Collaborative Digital Studio, creating intermediary spatiality between the enhanced presence and virtual co-presence. According to our analysis, these augmented spaces participate in helping and giving tools for learning to collaborate for students on one hand. They favor, on the other hand, sharing depending on the empowerment and the creation of private conversations (aparté) [29].

Moreover, the contribution of these augmented spaces has been demonstrated in the production of the group. In

 ISBN: 978-1-61208-436-7

fact, the Digital Collaborative Studio enables remote sharing of different artifacts in real time thus favoring collective production and, in certain observed cases, to realize drawings by two hands in an instantaneous and synchronized manner. These augmented spaces interfere also on the production operations the and interpretation of a drawing thus creating new manners of construction of the shared artifact in pairs.

D. *Analysis*

The analysis that is proposed here focusses on the process as well as the contents, by describing the evolution, in time, of the interactions of the actors and their implications in the common design object. It integrates the relevant descriptive dimensions already released in a qualitative manner during the transcript (communicational strategies, kinds of sequences, forms of collaboration, corporal communication, relational evolution, etc.). This qualitative point of view is then enriched by the interpretation of quantitative visualizations, offered by the COMMON Tools.

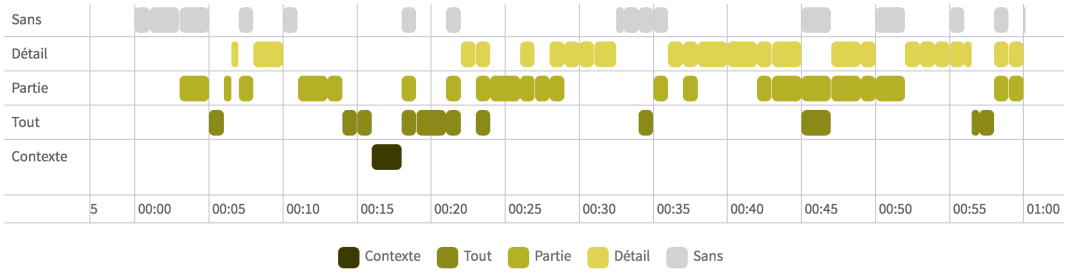

Figure 5. Example of visualization proposed by the COMMON Tools.
Time line of the design object : context / whole / part / detail / none.

V. CONCLUSION, LIMITS AND PERSPECTIVES

The method presented here and summarized in Figure 6, enables us to cross-reference the two aspects of a complex collective activity: the process and the content treated by a group. It focusses on the specificity of each actor, his work space, his documents as well as the interactions with other collaborators.

The direct observation method, without the possibility to record video data, moreover enables one to rationalize the rapid note-taking process. This procedure is not as complicated as the treatment of the verbalization but it does not produce only the qualitative observations. With the COMMON Tools, the researcher also has quick and easy access to the graphs during his analysis, with the support of a diversity of visual formalisms among, which he can interactively choose those which prove to be the most pertinent to be useful for his research question.

Contrary to other systems (cf. Section II.B), the flexibility of our method offers the possibility to renew, to call into question and/or add categories during the transcript and coding. This flexibility enables, on one hand, to analyze a substantial corpus of diverse configurations of collective activities involving several actors, and, on the other hand, to leave the possibility to the researcher to update his frame and thus avoid the preconceptions earlier defined before the activity without possibility to reconsider.

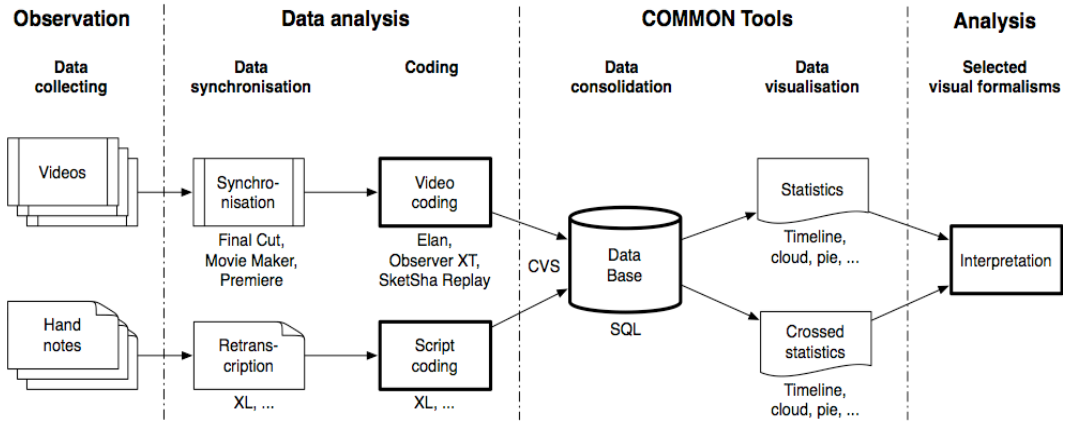

Figure 6. Process for analysing collaboration activities.

The main limit of the "concurrent protocols" is that the observed actors know that they are being observed, and that interferes with their way to work and interact together [14]. That is why it is important that the observers must be perfectly trained, capable and motivated. Thus, it is primordial to prepare them well and, more specifically, in the

context where rapid note-taking is essential. In such a context, we recommend a first phase where the observers take note of what happens during the first half hour of observation, according to very specific missions (cf. Section IV.A). Afterwards, the process is temporally suspended: all the observers meet in an isolated room, far from the observed site, to discuss for a few minutes their difficulties in observing. This phase allows them to stabilize and coordinate their strategies in order to start again, afterwards, their note-taking in a more coherent way and better adapted to the observed context.

A second difficulty was raised at the level of data processing (cf. Section IV.B). This difficulty concerns the choice of different criteria corresponding to each action treated. It is sometimes difficult to categorize each action in an exclusive and definitive manner. Nevertheless, the proposed frame makes it possible to cut the actions into sub-actions (vertically, in relation to time). It also offers the possibility to cross two categories (horizontally coded) and, thus, to clearly specify the links between one criterion and another. This flexibility and crossing are necessary to prevent beforehand interpretation by the analyst, who risks to make shortcuts in the conclusions or to slant the coding according to his own preconceptions.

A final difficulty is to be emphasized concerning the multiplication of proposed graphs by the COMMON Tools for visualizing the data (cf. Section IV.C). This multiplication enriches the analyses but makes the job of interpretation more difficult to organize. In fact, it is important to keep this flexible aspect, at the level of choosing the formalism, as well as at the level of the variety of criteria to be crossed. It is nevertheless contradictory to think that simple statistics done automatically by a tool could make sense by themselves. The method put forward in this article, leaning on the COMMON Tools, above all, enables one to build a first quantitative structure of observations to get one's bearings in the qualitative analysis of complex collective activity. It does not pretend to lead directly to interpretations and activity shortcuts by these quantitative data. It orchestrates and facilitates the work of interpretation and thus, enables the researcher/analyst to quantitatively confirm or reject hypotheses made during observations qualitatively ahead of the treated corpus.

ACKNOWLEDGMENT

This research is financed thanks to the grant Research Concerted Actions (ARC COMMON 2011-2015), the Scientific Research Direction of Education, French and Belgian Community, granted by the Wallonie-Europe Academy.

REFERENCES

[1] J. Karen, J. Ostergaard, and J. D. Summers, "Development of a systematic classification and taxonomy of collaborative design activities", in Journal of Engineering Design, 20:1, pp. 57-81, 2009.

[2] F. Darses, P. Falzon, and P. Béguin, "Collective design processes", in Proceeding of COOP'96, Second International Conference on the Design of Cooperative Systems. Juan-les-Pins, Sophia-Antipolis, INRIA, 1996.

[3] J. M. Carroll, D. C. Neale, P.L. Isenhour, M. B. Rosson, and D.S. McCrickard, "Notification and awareness: synchronizing task-oriented collaborative activity," in International Journal Of Human-Computer Studies, 58, pp. 605-632, 2003.

[4] J. S. Gero and U. Kannengiesser, "The situated function-behaviour-structure framework," in Design Studies, 25 (4), pp. 373-391, 2004.

[5] P. A. Gloor, "Swarm Creativity: Competitive Advantage through Collaborative Innovation Networks," Oxford University Press, Oxford, New York, 2006.

[6] Y. E. Kalay, "Architecture's New Media. Principles, Theories, and Methods of Computer-Aided Design," in The MIT Press: Communication, MIT Press, Cambridge, pp. 83-198, 2004.

[7] W. W. Gaver, "The affordances of media spaces for collaboration," in Proceedings of CSCW'92, ACM, New York, 1992.

[8] P. Dillenbourg, et al., "The socio-cognitive functions of community mirrors," in Proceedings of the 4th International Conference on New Educational Environments, Lugano, 2002.

[9] P. Leclercq, "Going collaborative," in Proceedings of 5th International conference CDVE Computer Aided Architectural Design: Experience Insight and Challenges, Calvià, Mallorca, 2008.

[10] J. S. Gero and H. H. Tang, "The differences between retrospective and concurrent protocols in revealing the process-oriented aspecs of the design process," in Design Studies, vol. 21, no. 3, pp. 283-95, 2001.

[11] F. Darses, P. Falzon, and C. Mondutéguy, "Paradigmes et modèles pour l'analyse cognitive des activités finalisées," in Ergonomie, Presses Universitaires de France, Paris, pp. 191-212, 2004.

[12] K. A. Ericsson and H. A. Simon, "Protocol analysis: Verbal reports as data," in MIT Press, Cambridge, MA, 1993.

[13] H. Kuusela and P. Pallab, "A comparison of concurrent and retrospective verbal protocol analysis," in American Journal of Psychology, vol. 113, no. 3, pp. 387-404, 2000.

[14] L. Nguyen and G. Shanks, "A framework for understanding creativity in requirements engineering," in Information and Software Technology 51, pp. 655–662, 2009.

[15] M. Suwa, T. Purcell, and J. Gero, "Macroscopic analysis of design processes based on a scheme for coding designers' cognitive actions," in Design Studies, vol. 19 pp. 455-83, 1998.

[16] C. H. Lewis, "Using the "Thinking Aloud" Method In Cognitive Interface Design," in Technical report, IBM. RC-9265, 1982.

[17] P. Lloyd, B. Lawson, and P. Scott, "Can concurrent verbalisation reveal design cognition?," in Design Studies, vol. 16, pp. 237-59, 1995.

[18] G. Gronier, "Méthodes d'analyse des communications fonctionnelles en situation de travail collectif," in Recherches Qualitatives, 9, 153-171, 2010.

[19] F. Détienne, G. Martin, and E. Lavigne, "Viewpoints in co-design: a field study in concurrent engineering," in Design Studies, 26, pp. 215-241, 2005.

 ISBN: 978-1-61208-436-7

[20] M. Reinert, “Alceste, une méthode statistique et sémiotique d’analyse de discours; application aux Rêveries du promeneur solitaire,” in La Revue française de psychiatrie et de psychologie médicale, 49(5), pp. 32-46, 2001.

[21] K. Dorst and J. Dijkhuis, “Comparing paradigms for describing design activity,” in Design Studies 16, pp. 261-274, 1995.

[22] J. S. Gero and T. M. Neill, “An approach to the analysis of design protocols,” in Design Studies, vol. 19, pp. 21-61, 1998.

[23] C. Brassac and N. Gregori, “Co-construction de sens en situation de conception d’un outil didactique,” in Studia Romanic Posnaniensia, no 25/26, pp. 55-66, 2000.

[24] J. F. Boujut and P. Laureillard, “A co-operation framework for product–process integration in engineering design,” in Design Studies 23 (6), pp. 497–513, 2002.

[25] www.lucid.ulg.ac.be/www/research/common/ [retrieved: July, 2015].

[26] www.sketsha.be [retrieved: July, 2015].

[27] S. Safin, V. Delfosse, and P. Leclercq, “Mixed-reality prototypes to support early creative design,” in The Engineering of Mixed Reality Systems, Springer, London, pp. 419-445, 2010.

[28] S. Ben Rajeb and P. Leclercq, “Using Spatial Augmented Reality in Synchronous Collaborative Design,” in Lecture Notes in Computer Sciences, Springer, vol. 8091, pp. 6-15, 2013.

[29] S. Ben Rajeb and P. Leclercq, “ Spatial augmented reality in collaborative design training: articulation between I-space, We-space and Space-between”, in Lecture Notes in Computer Sciences, Springer, LNCS 8526, vol 2, pp. 343-353, 2015.

 ISBN: 978-1-61208-436-7