

Guest Editorial

Ergonomic Analysis on Work Activity and Training

1. Introduction

It is an honor and a great pleasure for us to present this special issue for *WORK*. This selection of papers is an outcome of our symposium organized during the IEA congress 2009 (Beijing, China) that followed up previous IEA symposia.

Ever since the IEA Conference in Paris (1991), and at each of the subsequent triennial IEA conferences (Toronto, 1994; Tampere, 1997; San Diego 2000; Seoul 2003; Maastricht 2006), a highly active scientific committee (chaired alternately by M. Bellemare, C. Chatigny, M. Lacomblez, S. Montreuil, and C. Teiger) has taken the task to organize a multiple session symposium on “Ergonomic Work Analysis and Training”. Initially, such a scientific event aimed to develop and promote the ergonomic approach of work analysis in the field of vocational training.

Within this framework, “Activity” has been used as a central concept to understand work specificities. Hence, Daniellou and Rabardel [2] synthesized some major theoretical contributions defining Activity as being:

- something unique in time, space and in human intercourse even though historical opportunities presented to every worker and decisions made by private companies may weigh on Activity too;
- finalized because it is driven by personal, collective as well as organizational goals;
- mediated by tools, technical devices, cognitive schemes or pragmatic concepts giving a sense of direction of the workers’ capacities and practices;
- used to reach ergonomic transformational goals within the framework of an ergonomic approach [4].

Thus defined, “Activity” is the subject of scientific researches addressing both theoretical and practical issues. Hence, scientific questions are necessarily “*problem-oriented*”, as Welford [10] clearly demonstrated in the late fifties. Most researches today rely on “bottom-up” methods allowing them to re-arrange observed or surveyed events while modeling them according to Strauss and Glaser’s “*grounded theory*” [9].

Generally, scientific studies are qualitative as well as quantitative. Scientific legitimacy relies more on “feasibility” standards than on “positive truths”. Those standards are needed to make sense of a methodological project identifying the social dynamics and the obstacles to overcome in the study process while highlighting the changes that may occur in the course of the said study.

The purpose of the research developed in the vocational training field was therefore not to adjust workers’ behaviors or attitudes to changes on the workplace. Instead, it was meant to help them take into account environmental, organizational or technical changes, but also give them leeway and increase their capacity to play a role on the workplace through training.

In our early series of conferences, our main research themes included methods and theoretical frameworks that could be applied to training design and assessment as well as the assessment of the ergonomist’s interventions and the preventionist’s and trade unions training. Each triennial symposium gave us the opportunity to select papers providing synthetic views on the subject that would eventually be published in a book [2,3] or in special issues [5–8]. Naturally, our understanding of the said themes and topics has evolved over the last 18 years [2], but the current interest for vocational training stems from the fact that in the work environment, formal and informal training still play a key role in the implementation and support of many technical and orga-

nizational changes. While training programs are often designed to help operators adapt themselves, studies based on the ergonomic analysis of work have shown that operators may hope for another status allowing them to apprehend changes provided that the learning activity and work remain at the core of their training. Those studies have also re-established the relevance of addressing the issue of well-being along with economic and management issues. Using this approach, health and training, seen as inter-related subjects, have often been studied in a transversal way. To what extent, we may ask, did researches and practical exercises, based on ergonomic analyses of work, contribute to work transformations through training or in what way did those analyses provide useful information to the actors in the work environment which would eventually enable them to detect, understand, take action and preserve their health in a situation that is changing?

The contributions to this special issue of *WORK* address all these topics and illustrate the current scientific dynamism in this field of research. Because they represent several original attempts to conduct investigations related to “Ergonomics analysis on work activity and training”, these contributions allowed us to define four major themes.

2. “Work analysis” training

For a number of years now, the training of company employees or institutional employees has been included in the practice of ergonomics. Training union members to analyze work is one of the aspects covered by ergonomics. Training is also considered in relation to other issues (MSD, age, psycho-social risks) and actors (HR functions, occupational medicine, engineering, etc.). Here, methodological and theoretical issues regarding the elaboration of effective training systems can help define the characteristics of “participative research”.

Often studied, this historical topic is addressed in this special issue by Gaudart et al. They show how researchers and practitioners specializing in ergonomics and occupational medicine have been instrumental in the rehabilitation of occupational health in the French trade union practice.

3. Contents and the objectives of training

As we already noted in previous symposia, research studies and experimentations with training presently

relate both to the design and organization of training courses and to the activity of trainers. If any attempt were made to review and learn from these experiences, what would the outcome be? How can our current knowledge of training issues (trainers, trainees, work) optimize training and increase its benefits on the workplace while maintaining a sharp focus on health preservation? How can acquired knowledge in training session be evaluated? Can individual performances for a similar or related task – completed before and after training – be compared and ultimately provide a relevant evaluation?

Berglund and Karlton address the issue of the learning schedule for the Swedish Post Office staff sorting mail in new districts. They also analyze the means of supporting the learning process that will ultimately provide a better understanding and managing of it. Caubareille et al. present two ergonomic studies carried out when two French administrative bodies modernized their work tools. The objective is to identify and define the vocational learning of experienced technicians who were required to adopt new working methods to cope with these technological changes. Landry develops an approach to evaluate training and its effects on people’s health and safety at work. Santos et al. analyze within the theoretical framework of “Activity ergonomics”, the design practices of vocational professional training programs developed in two Portuguese companies.

4. Job trainers

The job of trainers has often been studied from the viewpoint of knowledge transmission, pedagogy and effectiveness of training, but rarely from the constraints these operators may have nor from the resources that are available to them (either personal or organizational). Consequently, how can the analysis of Activity on the workplace contribute to highlight the overall activity of trainers (teaching, but also preparing, evaluating, administrating, providing technical watch etc.) in its individual or its collective dimension? Understanding the trainers’ work activity in broad terms, but not only as a teaching activity, may also prompt us to ponder over the trainers’ working conditions as well as the health of operators and their potential for development throughout their professional life. Finally, the public and private aspects of the trainers’ professional activity put into question the method of analysis of work in its various applications. Four contributions provide food for thought on this issue. Chatigny documents the con-

text of performance within Canadian teachers practices focusing on their professional integration, the conditions imposed on them to keep their job, the difficulties they encounter, but also the impacts these difficulties may have on their work, health and professional knowledge. Munoz et al. analyze the co-piloting process of teaching-learning in French science courses. Finally, Vidal-Gomel et al. focus on French driver trainers' activity and the consequences for multiple trainers to share the same driving-course materials with the same trainee.

5. Beginners and experienced workers knowledge-sharing

Approaching the question of training through inter-generational relations implies focusing on the central issue of skills and adjustments at work and placing them in perspective with job requirements. What type of knowledge and skills in terms of organization and work tools do different workers hold in the context of a rapidly changing environment? Do current employment issues have an impact on the inter-generational inter-course on the workplace, on mutual assistance processes, on the transmission of knowledge and exchanges on the workplace? How can various types of work organizations develop and preserve mutual benefits defined as a state of "complementarity"?

From that perspective, Delgoulet et al. illustrate the various aspects of the first job experience and the diversity of ways in which people take on and learn a first job in the French construction sector. Thébault et al. show how transmission activity in a French hospital provide opportunities to share information among experienced and newly hired nurses or nurse's assistants. They also highlight that the transmission activity may be an opportunity among experienced nurses to discuss the quality of their work.

Guest Editors

Catherine Delgoulet

LATI – Paris Descartes University / CREAPT (France)
71, avenue Edouard Vaillant
92 774 Boulogne-Billancourt cedex
France
Tel: +33 1 55 20 57 08
E-mail: catherine.delgoulet@parisdescartes.fr

Dominique Cau-Bareille

IETL – Lyon 2 University / CREAPT (France)
86 rue Pasteur
69007 Lyon
France
Tel: +33 4 78 19 41 86
E-mail: Dominique.Cau-Bareille@univ-lyon2.fr

Eline Chatigny

CINBIOSE, UQAM
Département d'éducation et formation spécialisées
C.P. 8888. Succ. Centre-ville
Montréal (Québec),
Canada, H3C 3P8
Tel: +1 514 987-3000 ext. 3772
Fax: +1 514 987-3430
E-mail: chatigny.celine@uqam.ca

Corinne Gaudart

CNRS – LISE/ CREAPT
41, rue Gay Lussac
75005 Paris
France
Tel: +33 144 10 78 12
Fax: +33 144 10 79 34
E-mail: corinne.gaudart@cnam.fr

Marta Santos

Centro de Psicologia da Universidade do Porto
Faculdade de Psicologia e de Ciências da Educação
Universidade do Porto
Rua Alfredo Allen
4200-3135 Porto
Portugal
Tel: +351226079760
Fax: +351226079725
E-mail: marta@fpce.up.pt

C. Vidal-Gomel

Université de Nantes
Laboratoire: CREN
Chemin de la Censive du Tertre
BP 81227, F-44312 Nantes cedex 3
France
E-mail: christine.vidal-gomel@univ-nantes.fr

References

- [1] Daniellou, F., & Rabardel, P. (2005). Activity-oriented approaches to ergonomics: some traditions and communities. *Theoretical issues in Ergonomics science*, 6(5), 353-357.
- [2] Lacomblez, M., Bellemare, M., Chatigny, C., Delgoulet, C., Re, A., Trudel, L., & Vasconcelos, R. (2007). Ergonomics analysis of work activity and training: basic paradigm, evolutions and challenges. In R. Pikaar, E. Konongsveld et P. Settels (Eds.) *Meeting Diversity in Ergonomics* (129-142). Elsevier Ltd.
- [3] Rabardel, P., Teiger, C., Laville, A., Rey, P. & Desnoyers, L. (1991) Ergonomic work analysis and training. Exposé introductif à la session "Ergonomic and training". In Y. Quéinnec and F. Daniellou (Eds.), *Designing for everyone*, Proceedings of the 11 th Congress of the IEA, pp. 1738-1740, London: Taylor and Francis.
- [4] Guérin, F., Laville, A., Daniellou, F., Duraffourg, J., & Kerguelen, A. (2007). *Understanding and transforming work. The practice of ergonomics*. Lyon: ANACT.
- [5] Special Issue: *Safety Science*, Vol.23, n°2/3, 1996.
- [6] Special Issue: L'ergonome, le formateur et le travail. *Education Permanente*. n° 124, 1995.
- [7] Special Issue: PISTES (<http://www.pistes.uqam.ca>), Vol. 6, n°2, 2004.
- [8] Special Issue: Relations industrielles/Industrial relations, vol. 56, no 3, 2001.
- [9] Strauss, A., & Glaser, B. (1967). *The discovery of grounded theory*, Chicago: Aldine.
- [10] Welford, A.T. (1958). *Ageing and human skills*. London: Oxford University Press.