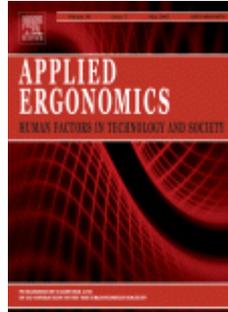


## **Applied Ergonomics - rok 2008, ročník 39**

### **Číslo 4 (July 2008)**



**Andrew S. Imada, Pascale Carayon. *Editors' comments on this special issue devoted to macroergonomics.* Pages 415-417.**

**Hal W. Hendrick. *Applying ergonomics to systems : some documented "lessons learned".* Pages 418-426.**

**Abstract:** Based on evidence accumulated during the author's 45 years of professional experience, the author presents 23 important "lessons learned" regarding applying ergonomics to systems. Documented results from reported cases or other evidence are presented to validate each of these practical learning points.

- **Keywords:** Ergonomics lessons learned; Macroergonomics; Systems

**Barrett S. Caldwell. *Knowledge sharing and expertise coordination of event response in organizations.* Pages 427-438.**

**Abstract:** This paper provides an overview of opportunities and challenges for expert coordination, knowledge sharing, and task performance using advanced information and communication technologies. Evolving in part from [Hendrick, H., 1991. Ergonomics in organizational design and management. Ergonomics 34(6), 743-756] discussion of macroergonomics, this paper describes the author's framework for systems engineering analysis of information flow and performance at team and organizational units of analysis. Work in the author's research lab has focused on several aspects of information technology use and team interactions to support shared understandings, task demands, and effective responses in responses to events. Multiple empirical studies are summarized describing evaluations of technology use, task cycles and expert knowledge coordination in several settings, including aerospace, healthcare, and project management.

- **Keywords:** Feedback systems; Information technology; Sociotechnical systems; Team performance

**Gabriel García Acosta, Karen Lange Morales. *Macroergonomic study of food sector company distribution centres.* Pages 439-449.**

**Abstract:** This study focussed on the work system design to be used by a colombian food sector company for distributing products. It considered the concept of participative ergonomics, where people from the commercial, logistics, operation, occupational health

areas worked in conjunction with the industrial designers, ergonomists who methodologically led the project. As a whole, the project was conceived as having five phases: outline, diagnosis, modelling the process, scalability, instrumentation. The results of the project translate into procedures for selecting, projecting a new distribution centre, the operational process model, a description of ergonomic systems that will enable specific work stations to be designed, the procedure for adapting existing warehouses. Strategically, this work helped optimise the company's processes and ensure that knowledge would be transferred within it. In turn, it became a primary prevention strategy in the field of health, aimed at reducing occupational risks, improving the quality of life at work.

- **Keywords:** Macroergonomics; Distribution centres; Variability

**Elizabet Haro, Brian M. Kleiner. *Macroergonomics as an organizing process for systems safety*. Pages 450-458.**

**Abstract:** Hendrick is attributed with the formalization of organizational design and management (ODAM) in ergonomics [Hendrick, H.W., Kleiner, B.M., 2001. *Macroergonomics: An Introduction to Work System Design*. Human Factors and Ergonomics Society, Santa Monica, CA.]. Specifically, the method called "Macroergonomic Analysis of Structure" or MAS provides a framework and analysis of these factors and provides the context for an analysis of organizational design and management process through the MacroErgonomic Analysis and Design method (MEAD). Together, MAS and MEAD represent the formalization of staple methods in macroergonomics and can be used to organize existing tools and methods such as those that exist in systems safety and help to differentiate macroergonomics from other approaches. This article illustrates such an integrative role for macroergonomics with respect to systems safety using the example of the construction sector, a domain in which accidents, injuries and fatalities are all too common.

- **Keywords:** Macroergonomics; Systems safety; Construction

**Richard J. Holden, Calvin K.L. Or, Samuel J. Alper, A. Joy Rivera, Ben-Tzion Karsh. *A change management framework for macroergonomic field research*. Pages 459-474.**

**Abstract:** With the proliferation of macroergonomic field research, it is time to carefully examine how such research should be managed and implemented. We argue that the importance of attending to high-quality *implementation* of field research is equal to that of methodological rigor. One way to systematically manage the implementation process is to adopt a change management framework, wherein the research project is conceptualized as an instance of organization-level change. Consequently, principles for successful organization-level change from the literature on change management can be used to guide successful field research implementation. This paper briefly reviews that literature, deriving 30 principles of successful change management, covering topics such as political awareness, assembling the change team, generating buy-in, and management support. For each principle, corresponding suggestions for macroergonomic field research practice are presented. We urge other researchers to further develop and adopt frameworks that guide the implementation of field research.

- **Keywords:** Macroergonomic field research; Research implementation; Change management

**Kazutaka Kogi. *Facilitating participatory steps for planning and implementing low-cost improvements in small workplaces*. Pages 475-481.**

**Abstract:** In this paper, practical means of facilitating participatory steps taken in workplace improvement programs in small workplaces were reviewed. The reviewed programs included those organized by partners of our Asian inter-country network for small enterprises, construction sites, home workplaces and agricultural farms. Trainers who commonly acted as facilitators were found to play multiple roles in helping managers, workers and farmers take initiative and achieve immediate improvements. The participatory steps were more successfully facilitated when the trainers supported (a) building on local good practice, (b) focusing on a range of basic ergonomics principles, and (c) stepwise progress through feedback of achievements. The use of action-oriented toolkits comprising low-cost action checklists and group work guides was commonly helpful. The locally adjusted nature of the toolkits seemed essential. Trainers could thus help people build local initiative, plan and implement low-cost ideas through serial group work steps and confirm benefits in a stepwise manner. The review of the results suggested that a local network of trainers trained in the use of locally adjusted toolkits was vital for facilitating effective improvements in different small workplaces.

- **Keywords:** Participatory steps; Small workplaces; Facilitation; Action-oriented toolkits; Developing countries

**Michelle M. Robertson, Yueng-Hsiang Huang, Michael J. O'Neill, Lawrence M. Schleifer. *Flexible workspace design and ergonomics training : impacts on the psychosocial work environment, musculoskeletal health, and work effectiveness among knowledge workers.* Pages 482-494.**

**Abstract:** A macroergonomics intervention consisting of flexible workspace design and ergonomics training was conducted to examine the effects on psychosocial work environment, musculoskeletal health, and work effectiveness in a computer-based office setting. Knowledge workers were assigned to one of four conditions: flexible workspace ( $n=121$ ), ergonomics training ( $n=92$ ), flexible workspace+ergonomics training ( $n=31$ ), and a no-intervention control ( $n=45$ ). Outcome measures were collected 2 months prior to the intervention and 3 and 6 months post-intervention. Overall, the study results indicated positive, significant effects on the outcome variables for the two intervention groups compared to the control group, including work-related musculoskeletal discomfort, job control, environmental satisfaction, sense of community, ergonomic climate, communication and collaboration, and business process efficiency (time and costs). However, attrition of workers in the ergonomics training condition precluded an evaluation of the effects of this intervention. This study suggests that a macroergonomics intervention is effective among knowledge workers in office settings.

- **Keywords:** Office ergonomics intervention; Musculoskeletal discomfort; Business process efficiency

**PA Scott. *Global inequality, and the challenge for ergonomics to take a more dynamic role to redress the situation.*Pages 495-499.**

**Abstract:** This paper argues that ergonomics is more sorely needed, easier to implement, and potentially far more effective in industrially developing countries (IDCs) than where its efforts are presently most concentrated in the less populated, more affluent, technologically advanced world. The reasoning is a simple extension of the principle of diminishing returns in which the further from optimal a situation is, the greater the beneficial effect of any implemented improvement. The paper draws attention to the gap between 'have' and 'have not' cultures, plus the necessity for, and relative ease with which a sustainable ergonomics ethos can be engendered in IDCs. This requires a need to consider network causality, investigating both micro-problems (basic interaction between task and worker) and macro-conditions of the overall scenario (including managerial organisation, planning and responsibility). The two-pronged

symbiosis of micro- and macro-ergonomics intervention has the potential to achieve both effective and sustainable development within small, medium and large enterprises.

- **Keywords:** Developing regions; Disparity; Organisational synergism; Sustainability

**L.I. Sznelwar, M.T. Silva, F.L. Mascia. *Working in public health services in Brazil : the relationship between different rationalities.* Pages 500-508.**

**Abstract:** Success in a public health system is related to its ability to change its production process and to deal with general principles of the health system, such as universality and equity. The frameworks proposed by service marketing scholars have been developed primarily for private services; they focus on acceptance by the targeted client-users, and on the technical specifications of the new service delivery processes. Little attention has been given to the employees' point of view and their activities to maintain service operations modulated by innovation. In a public health system, workers make decisions in real time related to users' needs and the technical specifications of the process; therefore, it is very important to understand how the changes impact on employees' activities and on the quality delivered for citizens. This article discusses how changes implemented in Sao Paulo, Brazil impact the organizational parameters and working activities for front-line workers.

- **Keywords:** Service operations management; Service concept; Operations change; Working activities

**Alvaro D. Taveira. *Key elements on team achievement : a retrospective analysis.* Pages 509-518.**

**Abstract:** This study is a historical reconstruction and in-depth scrutiny of one very successful team initiative within a Quality Improvement (QI) program in a municipal government organization. The identification of the essential concepts that contributed to the team's success and their integration into a local explanatory theory of team achievement is the final purpose of the study. The focus of this retrospective study is on the team process, with primary attention given to team members' perspectives and reflections on the project development. Data collection and analysis were conducted with methods drawn from the qualitative research tradition and from Quality Management. Main findings point to the importance of consistent management support, correct team composition with an emphasis on the team leader choice and demeanor, and to the central role of training in the group conduct. The negotiated approach to decision-making employed by the team, which reflected its organizational context, and the effort and mechanisms that allowed the group to reach equilibrium between internal and external interests proved critical for its ultimate achievement.

- **Keywords:** Teamwork; Participation; Qualitative

**P. Vink, A.S. Imada, K.J. Zink. *Defining stakeholder involvement in participatory design processes.* Pages 519-526.**

**Abstract:** A participatory approach could be used to implement work place or organizational improvements. However, the question is which participants should be involved and how. In this paper the theoretical involvement in different steps of a linear stepwise approach is described and compared with the latest projects of 300 practitioners.

From a theoretical point of view ergonomists and employees play an essential role in the improvement process and are involved in most stages of a change process. Designers play an important role in idea generation and prototyping. Top management and middle

management are important in the first step to set goals that are consistent with the strategy of the enterprise. Middle management is also needed in the steps where improvements are selected. This theoretical prediction is affirmed. However, middle management appeared to be also involved in implementation. The role of ergonomists is in practice limited in later stages in implementation, which is not preferred by the ergonomists.

- **Keywords:** Participatory design; Involvement; Stakeholders

**Klaus J. Zink, Ulrich Steimle, Delia Schröder. *Comprehensive change management concepts : development of a participatory approach. Pages 527-53.***

**Abstract:** During the last years, many change projects in organizations did not have the planned success. Therefore at first, the causes for these failures and the success factors contributing to organizational change have to be discussed. To get better results, a comprehensive change management concept has been developed and tested in an ongoing research project. By using concepts for an integrated assessment and design of organizations, an approach for analyzing the current situation has been elaborated to identify "lack of integration" in the change initiatives of a company. To realize an integrated overall approach of modernization by harmonizing different methods and concepts, first, one has to prove their relationship to policy and strategy (vertical harmonization). The second step is to take into account the fact that there has to be a logical fit between the single concepts (horizontal harmonization). But even if all elements are logically coherent, that does not mean that the people working in the company also see this coherence. Therefore, in addition to the "logical fit", one has to examine the "psychological fit". In the end, a concept for analyzing the status quo in an organization as a result of "objective data" and "subjective data" originated. Subsequently, instruments for harmonizing different modernizing concepts have been applied. As part of the comprehensive change management concept participatory ergonomic approaches have been used during the project. The present study shows this approach in the case of one company.

- **Keywords:** Change management; Organizational development; Participatory approaches