Shared Mental Models – linking team cognition and performance

R. BIERHALS¹, I. SCHUSTER¹, P. KOHLER², and P. BADKE-SCHAUB³

¹ Department of Psychology II, University of Bamberg, Weide 18, 96047 Bamberg, Germany
² DaimlerChrysler, Data and Process Management (GR/EPD), Ulm, Germany
³ Faculty of Industrial Design Engineering, Delft University of Technology, The Netherlands

Email: reimer.bierhals@ppp.uni-bamberg.de; ilona.schuster@ppp.uni-bamberg.de

In order to meet the increasingly complex demands of design in multidisciplinary teams, designers have to interact and thereby to interweave their mental models (MM). Yet, neither is it clear which content of MM should be shared to perform design tasks effectively, nor is the process of the development of shared mental models (SMM) quite understood. The two studies presented in this article were conducted to gain insights into the cognitive processes of designers working together in a team, and to clarify the impact of SMM on team performance. Process-oriented research strategies were applied to groups of mechanical engineering students and to multidisciplinary project teams in the automobile industry. The results indicated that not the SMM of the whole group but the SMM of subgroups were related to group performance. Moreover, this link to performance is only supported by the SMM about team members’ skills (SMMteam) and about the process of interaction (SMMprocess). As a conclusion of the latter result, more attention should be paid to the development of a common knowledge about group interaction and team members’ abilities in every day work life of project teams. In addition, observational data showed that motivational aspects like the feeling of competence should be considered when analysing the influence of SMM. Finally, a conceptualisation of the development and interplay of mental sub-models is proposed.

Keywords: Shared mental models; complex problem solving; process-oriented research; multidisciplinary design teams