HFE values for sustainable world: a preliminary demonstration of theory into practice.

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Introduction: Due to the imminent dangers of climate change and degradation to our planet, working towards sustainability is a priority for all disciplines. In previous papers, we proposed a group of values that we believe should be adopted if the Human Factors and Ergonomics (HFE) community really wishes to contribute to a more sustainable world (Lange-Morales et al, 2014). These values are stated as: respect for the Earth, respect for human rights, respect for ethical decision making, respect for transparency and openness, appreciation of complexity, and respect for diversity (Lange-Morales et al, 2014). On the one hand, these values have only been stated at a theoretical level, and in order to really contribute, we need to move these values from theory into practice. On the other hand, even if not explicitly acknowledged, we believe that a number of HFE investigations have already enacted at least some of the proposed values, giving us an opportunity to learn from their experiences. In order to move from theory into practice, we analyse several published practical studies that have implicitly shared the proposed values, asking how the values have been enacted in real-life HFE investigations. The three studies under consideration in this paper are a mixture of a problem-identification study, a problem-solving study, and a mixture of problem-identification and problem-solving.

Method: This is a qualitative, interpretive study. Three case studies were selected from the published HFE literature based on their stated aim to address a combination of issues related to social, environmental, and economic sustainability. The case studies were carefully content analysed to identify features that represented the six values specified by Lange-Morales et al (2014). Careful attention was paid to the type of study (i.e. problem-identification, problem-solving, or a combination) to ascertain whether there were any emergent patterns in the adoption of values in relation to the type of study.

Results: The first case study was a paper by Celestino et al (2012) that describes a macroergonomics investigation of raft fisherman in, Brazil. The paper presents the problems these fisherman are facing due to change of weather conditions and demographic density in the area. This case study carefully documents in the HFE problems but stops short of identifying solutions. The second case study by Kogi et al (2005) describes a participatory ergonomics intervention for subsistence farmers in four provinces in Vietnam. The project used a combination of “best ergonomics practice” pictures in six technical areas to train farmer trainers to go out into the farming areas and to work using a participatory approach to identify local, low-cost solutions to HFE problems. The case study emphasise problem-solving. The last case study by Saravia (2004), presents the application of the ergoeccological method to the construction of a ship at a shipyard in Colombia. The study focuses on the identification of high-risk problem areas, analysing negative impacts on the human working environment and natural environment, suggesting solutions.

Discussion and conclusion: The values of appreciation of complexity, respect for the Earth, and respect for human rights were found in all case studies, while the values of respect for transparency and openness, respect for diversity, and respect for ethical decision-making were only found in the study oriented towards problem-solving. Appreciation of complexity is a basic value in order to identify the problem from a more holistic perspective and this is necessary if one wishes to address sustainability beyond the economic and social dimensions. Respect for the Earth, respect for human
rights, respect for transparency and openness, and respect for diversity seem to be key aspects for both problem-identification and problem-solving. Lastly, respect for ethical decision-making acquires importance especially (but not exclusively) for problem-solving. While further investigation is needed, we conclude that the proposed values have a different weight depending on whether they are used for problem-identification or for problem-solving.

**Keywords:** Ergonomics, sustainability, values, problem-identification, problem-solving

**References**


