PERGAMON

Job characteristics and computer anxiety in the production industry

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Abstract

The present study was part of a larger Norwegian research effort termed "Learning in computer based industrial information networks," which is funded by the Norwegian Research Council. This action research based investigation was aimed at developing and implementing computer technology for improving profitability, employee well being, and work environment. The present study was conducted to investigate antecedents of computer anxiety, and was based upon a postal survey conducted in 1999. The sample included 336 employees. Data analyses were performed with structural equation modeling (LISREL). In addition to gender, age and education, the data analyses revealed that the job characteristics of decision authority and training were the most important determinants of computer anxiety. Job demands did not relate significantly to computer anxiety. Managers had less computer anxiety than non-managers. The practical implications of these findings corresponded with findings in a number of other Norwegian action research studies, and suggested that clear and specific goals should be expressed for any continuous improvement activity. New technology introductions should be accompanied by user involvement, training and active practical use. Special attention should be paid to women, lower educated, and older employees. © 2002 Elsevier Science Ltd. All rights reserved.

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The search for flexibility in knowledge and skills in working life puts new demands on the contemporary adult work force. Sophisticated computer systems, with ever increasing processing power, are becoming cheaper, smaller, and more widely used both for white-collar work and in the shop floor jobs. Computerized systems have become an integral part of modern business practice and it has become increasingly difficult to avoid daily interaction with computerized technology. The

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rate of end user growth (persons who interact with a computer as part of their job but are not programmers or analysts) particularly among employees with little or no data processing background, is phenomenal. Evidence suggests that the end user has become crucial to the success or failure of a computerized communication system (Cheney & Dickson, 1982).

The use of computers is no longer restricted to processing and computations; computers are the new tools for information delivery, data analysis, and all kinds of communication and production processes. This means that an employee is required to consider learning as a lifelong process of constructing and applying knowledge in contextualized and specialized problem areas. There are, however, groups of employees that experience computer anxiety or negative affective attitudes to computers (Cohen & Waugh, 1989; Worthington & Zhao, 1999). A review of the literature suggest that around one third of employees within most work environments experience computer anxiety to some degree (Brosnan & Davidson, 1994).

In the last two decades a lot of work has been done verifying the existence of the construct of computer anxiety (i.e. Cohen & Waugh, 1989; Loyd & Gressard, 1984; Marcoulides, Mayes, & Wiseman, 1995). Attention is given to clarify the relationship between computer anxiety and factors such as gender, age and level of familiarity with computers (Ayersman & Reed, 1995–1996; Gos, 1996). Other researchers have done important research to seek ways to predict who will experience computer anxiety and subsequently how to reduce it (Dupagne & Krendl, 1992; Szajna, 1994). However, within the body of empirical literature, computer anxiety is not understood in light of the prevailing and dominating models of occupational health, such as the demands–control model (Karasek & Theorell, 1990) or the effort–reward model (Siegrist, 1996). This paper will focus on the causes of computer anxiety, and independent variables include the theoretical framework of the demands–control model as well as individual coping style, user involvement and computer technology training.

1. Background and context

Computer anxiety has typically been characterized as fear about working with a computer or thinking about working with a computer (Worthington & Zhao, 1999). In the study of human–computer interaction, computer anxiety and negative attitudes toward computers have been identified. Negative attitudes toward computers emphasize people's feelings about the impact of computers on society and the quality of life in general, and their understanding of computers (Ahl, 1976; Lee, 1970). Computer anxiety involves a more affective response. Computer anxiety measures resistance to and avoidance of computer technology as a function of fear and apprehension, intimidation, hostility, and worries that one will be embarrassed, look stupid, or even damage the equipment (Heinssen, Glass, & Knight, 1987). Computer anxiety is evoked by the consideration of the broader implications of computer use for perceptions of the self, society and culture (Worthington & Zhao, 1999). The introduction of computer technology into a social setting may be seen as a cognitive