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Coping with information overload in email communication: Evaluation of a training intervention

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ABSTRACT

The present paper introduces three facets of information overload in email communication: A large amount of incoming information, inefficient workflow, and deficient communication quality. In order to cope with these facets of information overload, a training intervention was developed and evaluated. Data were collected from 90 employees on several evaluation levels within a longitudinal evaluation design (one pretest double posttest design). The results reveal that the training contributed to an increase in knowledge and media competencies. We also found evidence for a transfer of training contents to the workplace. Finally, strain diminished on several dimensions. In particular, problems with media usage and work impairment decline significantly, an effect that was stronger for those participants who face a large amount of email at their workplaces.

1. Introduction

During the last decades, email communication has found its way to the workplace and has become an inherent part of today's working life (Dabbish & Kraut, 2006). Email communication became popular due to its key advantage; easy and rapid exchange of information that simplifies communication in large and geographically distributed organizations (Sproull & Kiesler, 1991). In fact, Rice and Bair (1984) believed that the use of electronic media would increase both personal and organizational productivity (see also Crawford, 1982). However, due to the increasing diffusion of email communication in organizations, the volume of email received has steadily increased to the point where concerns have been raised as to whether email contributes to employees' "information overload" (e.g., Dabbish & Kraut, 2006; Edmunds & Morris, 2000; Farhoomand & Drury, 2002). Preliminarily, information overload can be defined as experiencing a large amount of information that exceeds an individuals' information processing capacity (Schultze & Vandenbosch, 1998). Though a considerable number of articles on information overload due to emails can be found in the popular press (e.g., Musgrove, 2007; Stross, 2008), only more recent research has both accumulated systematic evidence for increased information overload at the workplace and revealed its impact on strain (e.g., Hair, Renaud, & Ramsay, 2007). For example, Moser, Preising, Göritz, and Paul (2002) found evidence that information overload due to email communication is related to increased psychosomatic complaints and to less job satisfaction.

In respect of these problems, the aim of the current paper is the development and evaluation of a training intervention that enhances a more effective use of email communication, and therefore strives to cope with information overload. In the following we first specify the contents of such a training intervention. Afterwards we describe and report the results of an evaluation study that assesses the effectiveness of the training intervention.

2. Coping with information overload in the context of email communication: A training intervention

In order to derive the issues that should be addressed by a training intervention, we first introduce three facets of information overload in the context of email communication, namely a large amount of incoming information, inefficient workflow, and deficient communication quality.

2.1. Facets of information overload

2.1.1. Large amount of incoming information

There are several causes of the increase in the amount of email messages. Besides the steadily growing diffusion of email communication in general, the "ease of communication" leads to an augmentation of sent and received emails. Sending emails to a multitude of recipients requires only a modicum of effort since they do not have to be printed out and delivered to a post office. The consequence of this increased quantity of emails is obvious: Inboxes become jam-packed and result in a confusing mixture of relevant and irrelevant emails, which hinders efficient information processing (Whittaker & Sidner, 1997). In fact, the term

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"information entropy" describes email users' experience of incoming messages not being sufficiently organized by topic or content, nor of being easily recognized as important or as part of the history of communication on a given topic (Hiltz & Turoff, 1985).

2.1.2. Inefficient workflow

A large amount of incoming messages combined with inappropriate working habits may impair information processing capacity and therefore promote information overload (Whittaker & Sidner, 1997). For example, Lantz (1998) concluded that those employees reporting problems with emails are not those who received and sent the most emails, but those who have not developed an effective structure for filing incoming emails, e.g., in separate folders. Whittaker and Sidner (1997) used the term "email overload" to describe the dysfunctional use of email programs beyond their basic communication functions. For example, the collection of "To-do-emails" in the inbox can contribute to a cluttered and fragmented inbox, the result being that users lose track of their tasks (Bellotti, Ducheneaut, Howard, Smith, & Grinter, 2005; see also Dabbish & Kraut, 2006). Another challenge to efficient workflow is interruptions. New emails steadily reach recipients (Jackson, Dawson, & Wilson, 2001; Kraut & Attewell, 1997; Whittaker & Sidner, 1997), resulting in continuous interruptions and in loss of control over the receiving of information (Hiltz & Turoff, 1985). As a result, decision-making performance suffers, especially during completion of complex tasks (Speier, Valicich, & Vessey, 1999).

2.1.3. Deficient communication quality

Up to this point, information overload has been characterized as the delivery of too many messages to be able to properly deal with or to respond to (e.g., Farhoomand & Drury, 2002). Beyond this quantitative issue, email messages are often deficient in their quality. For example, compared to business letters, email communication is often considered a spontaneous and less formal communication medium (Nantz & Drexel, 1995). This notion of email communication often leads to superficially and ambiguously formulated messages that fail to give the recipients enough information to act upon, and therefore fosters misunderstandings (Burgess, Jackson, & Edwards, 2005; see also Friedman & Currall, 2003). In addition, social and contextual cues are often missing in email communication, rendering messages even more difficult to understand (Sproull, 1991). Finally, email messages can contribute to ambiguity because communication rules are not well developed (Kiesler, Siegel, & McGuire, 1984). One example of ambiguity due to unclear communication rules occurs when senders expect recipients to respond to a message within a short time frame (Markus, 1994; Renaud, Ramsay, & Hair, 2006).

2.2. Addressing information overload

Information overload results from a discrepancy between the amount of information people receive and (the limits of) their information processing capacity (Schultze & Vandenbosch, 1998). Accordingly, there exist two general approaches to reducing information overload, (1) reducing the amount of incoming information and (2) enhancing recipients' information processing capabilities. Intervention strategies that aim to reduce the amount of incoming email can address various levels: Technical interventions concern features of corporate email systems that help to administer email, e.g., filters that automatically sort out unsolicited emails. Organizational interventions concern, e.g., the implementation of email policies that provide guidelines for email use at the workplace like an adequate use of the carbon copy (cc) function (see Barron & Yechiam, 2002). Our paper presents a training intervention that aims to deal with information overload at the individual level by enhancing information processing. Relating to the facets of information overload a training intervention should improve media competencies in order to cope with a large amount of email, improve personal workflow, and enhance email literacy.

2.2.1. Improving media competencies

The increased amount of incoming emails results in a mixture of relevant and irrelevant messages, which hinders efficient information processing. In order to cope with the given amount of email, a training intervention must enhance the participants' knowledge and readiness to use functions that permit a more efficient handling of incoming emails (see also Ducheneaut & Watts, 2005). For example, an email client can collect and file incoming emails according to pre-defined criteria like sender, date, topic, etc. (Dabbish & Kraut, 2006). This "email classification" helps to pre-structure a recipient's inbox and therefore supports subsequent information processing (Whittaker, Bellotti, & Gwizdka, 2007; see also Dredze, Lau, & Kushmerick, 2006). Another example is to highlight emails received in carbon copy ("cc emails") with another color in order to distinguish them from emails that are directly targeted to the recipient and therefore may be more important. In sum, the enhancement of media competencies that facilitate the management of incoming emails should help to reduce email overload. However, a training intervention should exceed the mere demonstration of functions provided by email programs, i.e., training should take into account an appropriate utilization of email functions at the workplace (see also Whittaker et al., 2007). In particular, categorizing and filing of emails (Whittaker & Sidner, 1997) as well as setting up appropriate structures of folders should be addressed (Lantz, 1998). That way, the training not only presents various technical means for coping with a high amount of incoming information but encourages the participants to decide what functions would be useful at their particular workplaces.

2.2.2. Improving personal workflow

Appropriate self-management techniques can help to optimize information processing, e.g., priority setting and task management (Whittaker et al., 2007). For example, a training intervention should recapitulate the principles of task management and address how these principles can be effectively implemented within email programs (e.g., definition of special folders, marking emails with flags, reminders, etc.). Furthermore, interruptions of work tasks by incoming emails occur when email communication has not been efficiently integrated into personal workflow and task management (Whittaker, Bellotti, & Gwizdka, 2006). In order to address this issue, one strategy can be to perceive email communication as a daily task that is subject to scheduling and workflow management. For example, an employee can schedule his emailing activities every two hours. In order to avoid interruptions in the meantime, the email program could be closed or the new email alert box could be turned off (Jackson, Dawson, & Wilson, 2003). Note that the aim of a training program should be to advise the trainees on how to modify or extend their already existing self-management techniques to email management that fits their working routines. For example, a recent study suggested that under certain conditions, frequent checking of incoming email can reduce email overload (Dabbish & Kraut, 2006).

2.2.3. Enhancing email literacy

In order to cope with superficial and ambiguous communication, a respective training intervention should address basic principles of email communication. Participants should learn how to write effective subject lines and write emails that are more concise and to the point (Jackson, Burgess, & Edwards, 2006). Further topics are targeting of emails (see also Kimble, Hildreth, & Grimshaw, 1998) and handling of email attachments. Basically, trainees should learn when to communicate via email. In this context, users