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COMPUTER KEYSTROKE LOGGING AND WRITING: METHODS AND APPLICATIONS

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Chapter 1

Keystroke Logging: An Introduction

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This chapter introduces the reader to keystroke logging of writing processes as a research method and places this method at the centre of writing research. We overview the features of the keystroke logging software that is currently available, indicate its domain of application and set the stage for the topics interrogated in this volume.

Keywords: keystroke, writing, revision, pause, logging.

1 Introduction

At a time when there is much debate internationally concerning approaches to writing research and their applications, this volume aims to contribute to the discussion by defining and illustrating a research method, which is attracting growing interest within the international research community. The approach, called keystroke logging, consists of the computer recording of writing activity as writers compose on the computer. As an observational tool, keystroke logging offers the opportunity to capture details of the activity of writing, not only for the purposes of the linguistic, textual and cognitive study of writing, but also for broader applications concerning the development of language learning, literacy and language pedagogy.

The work presented in this volume shares one common focus: the use of keystroke logging in a range of contexts. The purposes of the volume are to bring together work from a number of researchers to present both a retrospective and a prospective view on this approach to writing scholarship. This introductory chapter will define in general terms the main principles of keystroke logging as a research tool, both against the background of the writing process research agenda and in comparison with other methodological tools.

This will allow us to situate the chapters, which make up this volume, within the broader debate on writing research and in terms of main lines of research in the field and their applications.

2 Positioning Keystroke Research

Historically, keystroke logging has its theoretical underpinnings in a cognitive approach to writing, which is concerned with how language users navigate through the task of producing or understanding text. By definition such an approach is concerned with ‘what the writer does (planning, revising and the like) instead of [on] what the final product looks like (patterns of organization, spelling, grammar)’ (Applebee, 1986, p. 96), that is, presenting a writer- (rather than text-) based perspective on writing.

Focus on the process of writing has been a major force within composition and second-language writing research and pedagogy since the latter part of the last century, although there is controversy and difference of opinion as to its precise definition. Given the various strands of interest, which have emerged over the last few decades (for historical reviews see Grabe & Kaplan, 1996; Johns, 1990 and for an interesting critique of its complex historical development see Matsuda, 2003), ‘process’ is best understood as an umbrella term, spanning different disciplinary influences and concerns, including expressive, cognitive and social perspectives.

Of these, the cognitive dimension in writing research, appearing from the 1970s onwards, draws heavily on the interests and empirical methods of cognitive psychology. The concern here is with exploring the inner workings of the mind, that is, the component processes which underpin complex mental activity (Kellogg, 1994, p. 10). This perspective views writing as involving a complex set of hierarchically arranged cognitive activities or operations, which appear to be involved in all directed thinking tasks. These include the operations of collecting, generating and organising ideas according to a set of goals, the translating of these into text and the reviewing of both ideas and textual output. In this sense, writing is viewed as an exemplary form of human thinking, involving problem-solving and decision-making within clearly defined goals (Kellogg, 1994, p. 13). Indeed, the cognitive psychological stance (e.g. Nickerson, Perkins, & Smith, 1985) may even suggest that the study of writing opens up a window on the nature of thinking itself.

The origin of this angle on the study of the writing process is often claimed to be the early work of Emig (1971), whose case studies of individual writers used introspective techniques in an attempt to uncover the otherwise hidden process of writing. Other studies by researchers such as Perl (1979), Selfe (1981, 1984) and Sommers (1980) further developed these insights, using similar introspective and observational methods. From the late 1970s onwards, attempts were made to bring together these findings in a coherent model of the cognitive process of writing. The work of Flower and Hayes (1977, 1980, 1981, 1984; Hayes & Flower, 1980, 1983) is best known in this respect, and their attempts at developing a theoretical framework or cognitive model of the writing process are still widely recognised today.

Flower and Hayes’s (1980) representation of writing became extremely influential both in research and in pedagogic domains, providing the basis for much discussion of
the basic principles of a cognitive process approach to writing, namely that writing is a complex, goal-directed activity, comprising composing processes, which are ‘interactive, intermingling, and potentially simultaneous’ (Grabe & Kaplan, 1996, p. 91). Despite criticisms about the power of this as a model of writing (see, in particular, North, 1987) on the grounds of a lack of refinement of components, its limited explanatory power and weaknesses in protocol methodology on which the model is based, the framework that it provides for writing research and pedagogy remains of considerable significance. Emphasis on content and involvement over grammar and usage, the development of the writer’s voice, response and accommodation towards reactions from the writer’s audience, self-expression and procedural features, such as planning, drafting, revising as part of a nonlinear process, are all recognised nowadays as general principles of writing orthodoxy.

Further developments in the model (e.g. Flower et al., 1990; Hayes, 1996; Hayes, Flower, Schriver, Statman, & Carey, 1987; Hayes & Nash, 1996) have led to elaborations of the subcomponents of writing, and, consonant with the general shift of attention towards the social dimension in writing (see Atkinson, 2003; Bizzell, 1982; Tobin, 1994; Trimbur, 1994), a broadening of the more narrowly cognitivist perspective is seen in the work of those such as Flower et al. (1990) who now conceptualise writing as both a ‘cognitive activity’ and a ‘contextually constrained activity’ (Grabe & Kaplan, 1996, p. 115). This appears to be in line with widespread calls for a more comprehensive theory of writing to take account of a number of interconnected dimensions, namely cognitive, textual and sociocontextual aspects (Candlin & Hyland, 1999; Cumming & Riazi, 1996; Grabe & Kaplan, 1996; Witte, 1992). We see arguments, such as that made by Reither (1985):

writing and what writers do during writing cannot be artificially separated from the social rhetorical situation in which writing gets done, from the conditions which enable writers to do what they do, and from the motives writers have for doing what they do. (p. 621)

echoed in later statements by those such as Candlin and Hyland (1999), concerning the socially situated nature of writing:

writing research needs to move beyond a focus on the page or the screen to explore the uses to which writing is put, and to offer candidate explanations of how these uses may engender particular conditions of production and interpretation of texts in context. [...] Every act of writing is thus linked in complex ways to a set of communicative purposes which occur in a context of social, interpersonal and occupational practices. (p. 2)

The acknowledgement that writing research and pedagogy are now moving to embrace diversification and a genuine multidimensionality, as articulated in Matsuda’s (2003) reference to a movement ‘towards the era of multiplicity’ (p. 79), is to be welcomed. It allows the broadening of the research agenda to include cognitive, textual and social dimensions, legitimising concerns not only with the detail (in some senses abstract and largely asocial) of internal, individualistic and cognitive processing but also with the textual output of the