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How We Write with Crowds

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Writing is a common task for crowdsourcing researchers exploring complex and creative work. To better understand how we write with crowds, we conducted both a literature review of crowd-writing systems and structured interviews with designers of such systems. We argue that the cognitive process theory of writing described by Flower and Hayes [16], originally proposed as a theory of how solo writers write, offers a useful analytic lens for examining the design of crowd-writing systems. This lens enabled us to identify system design challenges that are inherent to the process of writing as well as design challenges that are introduced by crowdsourcing. The findings present both similarities and differences between how solo writers write versus how we write with crowds. To conclude, we discuss how the research community might apply and transcend the cognitive process model to identify opportunities for future research in crowd-writing systems.

CCS Concepts: • **Human-centered computing** → **Collaborative and social computing systems and tools**; *HCI theory, concepts and models*.

Additional Key Words and Phrases: crowd-writing; crowdsourcing; writing; writing theory; collaborative writing

1 INTRODUCTION

Writing is a powerful form of communication which most people encounter daily. Despite its pervasiveness, learning how to write well is not easy [6]. One successful method writers use is to decompose the act of writing into a process that involves a collection of tasks performed by the writer(s). Research about how people write has appeared in a wide range of academic disciplines, from psychology to education to computer science. For example, Flower and Hayes [16] detail a series of steps involved with writing as a solo writer.

While being a solo writer can be difficult, writing with multiple authors introduces additional complexity [40]. Effectively working with multiple authors requires understanding how people write together and how they communicate [3, 35, 45]. Wikipedia is one example of performing collaborative writing online and at-scale between writers working independently [71]. Yet, even in distributed collaborative efforts, like Wikipedia, writers have some control over what topics they choose to write about and how they choose to participate. Additionally, Wikipedia contributors have some understanding of how their work contributes to the collaborative effort.

Over the last decade a new form of crowdsourced writing has emerged in which online, distributed groups of workers with minimal mutual interaction [59] are brought together to generate

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