Digital Writing in the Workplace: The Present and the Future

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Abstract
Writing is an omnipresent activity, both in our personal and professional lives. In professional settings in particular, writing receives growing attention from scholars because of its key role in the knowledge economy. Indeed, it is by writing that we transform knowledge into consumer products (the texts). As in most other fields of the humanities, writing has been greatly transformed by digital technologies, and this transformation is still undergoing. Many empirical studies have contributed to the understanding of computer-aided writing. However, scholarship lacks recent empirical knowledge on computer tools used by workplace writers.
In order to gather data on computer tools' usage and appreciation, I conducted a pan-Canadian survey with 414 professional writers. Unexpectedly, the quantitative analysis unveiled two paradoxical situations. First, professional writers would like to use more computer tools, but feel that they are already using too many of them. Second, the professional writers' appreciation of some computer tools is possibly inconsistent. This paper also reports on a qualitative analysis of 325 comments provided by the professional writers. This section of the survey revealed five predominant concerns about the future: voice recognition, collaboration, integration, user-friendliness, and training.

Keywords: digital writing, workplace writing, professional writing, writing with computers, survey research, empirical study

Introduction

Writing is an omnipresent activity, both in our personal and professional lives. In professional settings in particular, writing receives growing attention from scholars because of its key role in the knowledge economy. Indeed, it is by writing that we transform knowledge into consumer products, that is, the texts (Brandt, 2005). As in most other fields of the humanities, writing has been greatly transformed by digital technologies (Bowie & McGovern, 2013; Cellier, Terrier, & Alamargot, 2007; Crozat *et al.*, 2011; Goulet, 2012; Herrington & Moran, 2009; McKee & DeVoss, 2007; Porter, 2007; Takayoshi & Huot, 2003; Takayoshi & Sullivan, 2007; Tardy & Jeanneret, 2007), and this transformation is still undergoing. Many empirical studies have contributed to the understanding of computer-aided writing (Leijten *et al.*, 2014; Newbold & Gillam, 2010; Puerta Melguizo *et al.*, 2008; Spartz & Weber, 2015). However, scholarship lacks recent empirical knowledge on computer tools used by workplace writers.

This article is a gesture to fill that gap, as it presents results from a pan-Canadian survey with 414 professional writers[1]. Using descriptive statistical methods, I will discuss the computer tools' usage and appreciation by professional writers. More specifically, I will put to light two paradoxical situations: 1) the fact that professional writers would like to use more computer tools, but feel that they are already using too many of them; 2) the possible inconsistency of the professional writers' appreciation of some computer tools. The paper also reports on a qualitative analysis of 325 comments provided by the professional writers. This analysis reveals five predominant concerns: voice recognition, collaboration, integration, user-friendliness, and training.

The next part of the paper is devoted to the background of the research, where I will summarize some relevant studies related to digital writing in the workplace. Then, I will describe the methodology employed to conduct the survey. The results and a discussion will follow. In the last part of the paper, I analyze comments provided by the respondents concerning the future of writing tools. As I will demonstrate, this qualitative analysis provides solutions that could solve the contradictions identified in the quantitative analysis.

Background

Scholars use different terms to refer to the concept of "digital writing". To name just a few examples: *computers and writing* (Bowie & McGovern, 2013)*, electronic writing* (Ferris, 2002), *web writing* (Santos & Leahy, 2014), and, of course, *digital writing* (DeVoss *et al.*, 2010; McKee & Porter, 2008). DeVoss *et al.* (2010) define digital writing as "compositions created with, and oftentimes for reading or viewing on, a computer or other device that is connected to the Internet" (p. 7). This quote suggests that today most writing is done for reading on a screen. The "digitalization" that we are witnessing has not only affected writing, but also distribution, and publication (Porter, 2007). Second, DeVoss *et al.* (2010)'s definition indicates that digital writing involves the use of a computer or another device, for example peripheral devices,

[1] I wish to acknowledge the financial support from Quebec Research Fund – Society and Culture.

software, and surrogates, such as tablets or phones, and that this device is connected to the Internet. Digital writing refers to various forms of writing, such as e-mails, web sites, and social networks (Bowie & McGovern, 2013). Digital writing is also associated with the concept of *hypertext* (Beaufort, 2008; Schriver, 2012; Wysocki, 2008), and the web, from which was created the expression *web writing*. In brief, digital writing encompasses a large range of interests.

Digital writing receives growing attention from scholars. Leijten *et al.* (2014) carried out a case study with one professional writer, during the construction of one writing project. Drawing on keystroke and interview data, the authors illustrate how the professional writer searches extensively through multiple sources for content and ideas, and how he modifies and reuses others' content. Also worth mentioning are the studies on the use of specific computer tools for writing. For example, Puerta Melguizo *et al.* (2008) evaluated a system that automatically searches, retrieves, and recommends information relevant to the text currently being written. The results show that when the system offers relevant information, the time to complete the task is shorter, and the quality of the text increases compared with the control situations in which writers have to look actively for information. For their part, Ferro & Zachry (2014) conducted a survey on the use of publicly available online services (PAOSs) by knowledge workers in the United States. Their results indicate that many knowledge workers use PAOSs (for ex. Twitter, Goggle Docs) not only for personal purposes but also to complete work tasks.

In Canada, Lesage *et al.* (1993) conducted a survey on computer tools used by professional writers. This group of researchers interviewed 225 Canadians in 72 public and private organizations, in order to gather data on computers' characteristics, on software, on reasons for rejecting software or for consulting printed resources, and on appreciation of computer tools. Three types of computer tools were included in the questionnaire: the electronic dictionary, the dictionary of synonyms, and the grammar correction software. The results show that, at the time of the survey, 76% of the respondents were using the electronic dictionary integrated in the word processor (that was a condition to participate in the study), 50% of the respondents were using a grammar correction software, and 18% were using an electronic dictionary of synonyms. Many reasons for not using the writing tools were identified by Lesage *et al.* (1993), for example the feeling that the tools are not needed, the lack of training that would facilitate the effective use of the tools, and the perception that the tools are not efficient. As for the appreciation of computer tools, results from their study show that it is in general positive, even though the respondents made a few demands. To give just an example, the professional writers denounced the absence of specialized vocabulary in electronic dictionaries. While Lesage *et al.*'s research was comprehensive in 1993, we have to admit that workplace writing has changed a lot over the last 25 years: many writing tools have been created (Max, 2012) and the internet has been democratized. The research presented in this paper aimed exactly at gathering recent data on digital writing in the workplace. In the next section, I will describe the methodology employed to create the Canadian survey.

Survey methodology

To be eligible, participants had to meet the following criterion: either write texts on a daily basis as part of their job, or spend at least half of their work time writing. The recruitment consisted principally of sending out invitations by email. Email addresses were found directly on employers' websites. To a lesser extent, websites for language professionals such as writers.ca provided email addresses for self-employed writers. In total, 3,585 emails were sent and 414 full surveys were received, rendering a satisfactory response rate of 11.6%.

The survey was created with LimeSurvey (limesurvey.org), in both French and English, Canada's official languages. It comprises 97 questions. The survey was divided in three sections. The first section aimed to describe the professional writers' profiles and the genres of texts they write, the second addressed the frequency of use and appreciation of specific computer tools, and the third examined their opinion on advantages and disadvantages of using those tools for writing at work. Data collection took place in 2013, from May to October. All responses were saved in LimeSurvey and then imported into Excel. Descriptive statistics were automatically computed by LimeSurvey.

Results and discussion

This section provides some information about the participants' profiles. As shown in table 1, 27.9% of the participants work in public services, 20.7% work in universities, 11.1% work in the media, and 7.9% work in non-profit organizations. Also, a considerable proportion of participants (23.3%) are self-employed.

Table 1. Survey results for the question concerning the type of organization where professional writers work.

Type of organization	***n* (of 484)**	**Percentage**
Public services	135	27.9
Self-employed	113	23.3
University	100	20.7
Media	54	11.1
Non-profit organizations	38	7.9
Private sector	20	4.1
Research centers	10	2.1
Professional associations	9	1.9
Political parties	5	1.0

Note. Respondents could choose more than one answer.

Participants have between 1 and 55 years of experience in professional writing. One half of them write texts in English, and the other half in French. Table 2 shows the range of documents produced by Canadian professional writers. Note that the respondents could choose more than one response.

Table 2. Survey results for the question concerning the genres written by professional writers.

Genres	*n* (of 414)	Percentage
Letters and memos	217	52.4
Newspaper or magazine articles	172	41.5
Web pages	168	40.6
Press releases	135	32.6
Instructions	126	30.4
Minutes from meeting	116	28.0
Ads or promotional material	116	28.0
Briefing notes	112	27.1
Information in social media	111	26.8
PowerPoint presentations	108	26.1
Pedagogical material	97	23.4
Research reports	92	22.2
Blogs	90	21.7
Annual reports	89	21.5
Policies	55	13.3
Grant applications	55	13.3
Popular scientific work	54	13.0
Technical documents	52	12.6
Scientific documents	46	11.1

Note. Respondents could choose more than one answer.

As we can see in table 2, letters and memos are the most common documents written by the participants, while scientific documents are the least common ones. It should be reminded that 11.1% of the survey participants work in media, which could explain the relatively high proportion (41.5%) that reported writing newspaper or magazine articles. Also worth mentioning: 40.6% of professional writers produce web pages and 26.8% publish information in social media, and 21.7% in blogs more specifically.

The survey first aimed to measure computer tools' frequency of use. The 15 tools listed in the survey were selected after a focus group study with 8 participants (Goulet, 2012). For each tool, respondents were asked "How often do you use this tool?" This question was accompanied by 4 exclusive options: "always", "often", "occasionally, and "never".

The results are presented in table 3. Professional writers who always use a tool were merged with those who often use it.

Table 3. Survey results on computer tools' frequency of use, ranked by number of responses for "always" + "often" (n= 414).

Computer tools	**Frequency of use (always + often) %**
Web search engines	98.3
Word processors	96.6
MS® Word's review functions	65.5
MS® Word's spelling and grammar checker	57.0
Online reference materials	50.3
Electronic encyclopedia	50.2
Text correction software (WhiteSmoke® or Antidote®)	34.8
Terminological databases	28.7
File hosting services	26.6
Blogs	17.8
Collaborative work platforms	15.5
Discussion groups	7.9
Concordancers	7.2
Authoring memory systems	5.1
Mind mapping tools	1.4

Table 3 shows that, among the 15 computer tools listed in the survey, Web search engines and word processors are the two most frequently used computer tools, with respectively 98.3% and 96.6% of professional writers who use them "always" or "often". Four computer tools are frequently used by 50% or more: MS® Word's review functions, MS® Word's spelling and grammar checker, online reference materials (for ex. grammar books), and electronic encyclopedia (for ex. Wikipedia). Let me briefly comment on results for MS® Word package. The survey indicates that MS® Word's spelling and grammar checker is more frequently used (57.0%) than WhiteSmoke® or Antidote® (34.8%). However, these statistics have to be interpreted in light of the fact that MS® Word package is omnipresent in Canadian workplaces. In other words, this preference could be contextual.

Table 3 also reports that 50% of the respondents frequently use online reference materials and electronic encyclopedia, which confirms that professional writers use electronic resources to look for linguistic information and to find information relevant to a project. If we add the fact that 17.8% of the professional writers frequently use blogs, and that 7.9% frequently use discussion groups, we can conclude that the Web is becoming (or has already become) a predominant source of information for professional writers. This conclusion is in accordance with Ferro & Zachry (2014), who reported that many knowledge workers use publicly available services such as blogs and forums to complete work tasks.

Nine computer tools received scores below 50%. More precisely, 15-35% of professional writers frequently use text correction software (WhiteSmoke® or

Antidote®), terminological databases, file-hosting services, blogs, and collaborative work platforms. According to these results, two hypotheses can be drawn: either these tools are in the "process of spreading" or writers do not find them useful for professional purposes. As we will see later, the survey provides information about the reasons why some computer tools are not used by professional writers.

Finally, my research also shows that some tools are practically never used: 1-8% of professional writers frequently use authoring memory systems, concordancers, discussion groups, and mind mapping tools. These tools were added after the focus group study, because they were mentioned by some participants. However, results from the quantitative study clearly indicate that these three tools are not widespread in Canadian workplaces.

Secondly, the survey gathered data in order to determine why some computer tools are not used by Canadian professional writers. When respondents ticked the "never" option, a block of possible reasons appeared, and they had to decide which one(s) related to them. Reasons included in the survey were inspired by the focus group study (Goulet, 2012). Respondents were allowed to check more than one reason. For example, someone may have ticked "I do not need this tool" along with "This tool is not effective". Table 4 presents the proportion that each reason represents, all tools considered.

Table 4. Survey results on the reasons for not using computer tools, all tools considered, ranked by number of responses.

Reasons	***n* (of 2534)**	**Percentage**
I did not know this tool existed.	1082	42.7
I do not need this tool.	847	33.4
I don't know how to use this tool.	241	9.5
This tool is not efficient.	89	3.5
I do not want to modify my work habits.	63	2.5
I prefer to use printed resources.	52	2.1
My work environment is resistant to this type of tool.	46	1.8
My employer does not want to buy this tool.	44	1.7
I fear that this tool would slow me down.	42	1.7
I cannot afford to buy this tool.	28	1.1
		100

Note. Respondents could choose more than one answer.

Table 4 shows that from a purely quantitative point of view, the most important reason for not using a computer tool is not knowing about its existence, which represents 42.7% of all cases. In second place, the belief that the tool is not needed represents 33.4%. Together, these two reasons account for 76.1% of all cases for not using a tool. In third place, but less prevalent, the lack of knowledge on how to use a computer tool represents 9.5% of all reasons for not using a tool. All tools considered, the seven other reasons listed in the survey were not very popular. For example, "I cannot afford to buy this tool" represents 1.1% of all cases.

For the rest of this section, I will concentrate on the three main motives chosen by Canadian professional writers to justify why they do not use some tools. Table 5

reports on the three main reasons chosen by professional writers, for each tool listed in the survey.

Table 5. Survey results on the reasons for not using specific computer tools, ranked by number of responses.

Computer tools	**Main reasons for not using %**			**N**
	Did not know it existed	Do not need it	Do not know how to use it	
Authoring memory systems	64.2	11.4	11.4	405
Concordancers	64.4	20.1	10.3	379
Mind mapping tools	38.2	39.3	11.6	361
Text correction software (WhiteSmoke® or Antidote®)	63.5	11.1	4.8	271
Collaborative work platforms	23.5	48.6	12.5	255
File hosting services	19.7	47.6	7.5	147
Discussion groups	2.6	67.1	5.1	234
Blogs	0.5	74.2	6.7	209
Terminological databases	47.9	30.2	10.4	192
MS® Word's checker	2.3	23.0	1.1	87
MS® Word's review functions	5.4	32.4	13.5	37
Online reference materials	25.0	39.3	14.3	28
Electronic encyclopedia	19.2	26.9	3.8	26
Word processors	0	60.0	20.0	5
Web search engines	0	0	0	1
				2637

We first notice, in table 5, that the most frequent reason for not using a tool, "I did not know that tool existed", is the most important one for four tools: the authoring memory systems, the concordancers, the text correction software (either WhiteSmoke® or Antidote®), and the terminological databases[2]. Certainly, these results suggest that many Canadian professional writers are not aware of all the possibilities that the industry has to offer. If we also consider that there exists much more computer tools than the 15 listed in the survey, the gap between the professional writers and the software industry could be in reality much more important.

We also notice that the second most frequent reason for not using a tool, "I do not need that tool", is the most important one for nine tools: mind mapping tools (although almost equal to the first reason), collaborative work platforms, file hosting services, discussion groups, blogs, MS® Word's review functions, online reference materials, electronic encyclopedia, and word processors (only one case). We can assume that the professional writers who chose this reason are aware of the existence of the computer tool in question, but believe that they do not need it. This assumption could suggest that professional writers have different needs.

[2] It is interesting to note that in Lesage *et al.* (1993)' study, the professional writers had denounced the absence of specialized vocabulary in electronic dictionaries.

The third reason included in table 5, "I do not know how to use this tool," is not the most important reason, for any of the tools listed in the survey. However, this reason is slightly over-represented for authoring memory systems (11.4%), concordancers (10.3%), mind mapping tools (11.6%), collaborative work platforms (12.5%), terminological databases (10%), MS® Word's review functions (13.5%), online reference materials (14.3%), and word processors (20.0%)[3]. However, if we agree that the professional writers who admitted not knowing about a tool in particular – which represents 43% of all cases – do not know how to use this tool, and that some professional writers who chose this reason would like to use new computer tools, then training could be viewed as an important issue.

This leaves us with the MS® Word's checker and the web search engines. As we can deduct from table 5, the most important reason for not using the MS® Word's checker is not one of the three most prevailing ones. In fact, the most important reason for not using the MS® Word's checker is the belief that it is not efficient with 43%. Considering that this reason represents only 3.5% of all cases in the survey (see table 4), it is clearly over-represented for this tool. Finally, the reason for not using web search engines (only one case) is the preference for printed resources.

The third section of the survey was designed to quantify the professional writers' opinions regarding the advantages and disadvantages of using computer tools. The first strategy used to measure the professional writers' appreciation was to present them with nine statements about computer tools. The statements were divided into two separate blocks, a block of positive statements and a block of negative statements.

Fig. 1 summarizes the general statistics for this section of the survey.

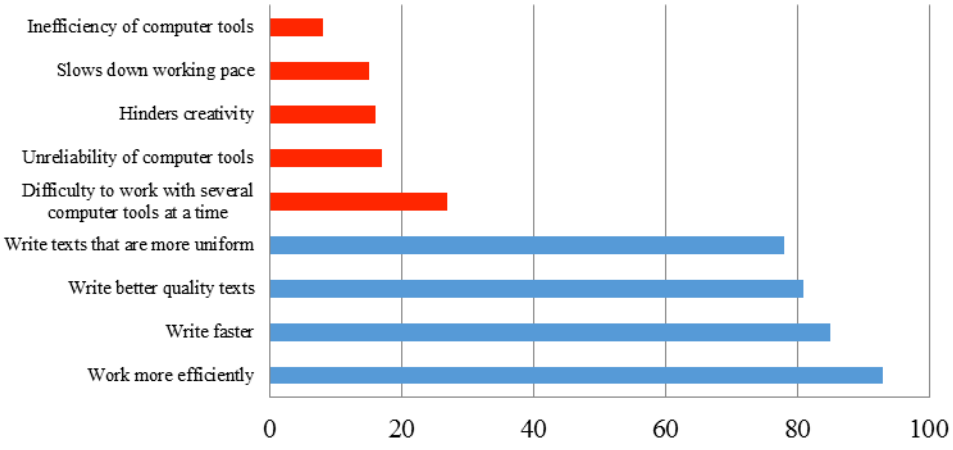

Fig. 1. A chart of the proportions of professional writers who agree or strongly agree with statements describing advantages (blue) and drawbacks (red) of using computer tools.

[3] The reader should note that there are only 5 cases all in all for the word processors.

As we can see in fig. 1, 78-92% of the professional writers "agree or strongly agree" that computer tools allow them to work more efficiently, write faster, write better quality texts, and write texts that are more uniform. On the other hand, 8-27% of professional writers "agree or strongly agree" that computer tools are inefficient, slow down their working pace, hinder creativity, are unreliable, or that it is difficult to work with several computer tools at the same time. Concerning the latter, in 1993 Lesage *et al.* advised the language industry to integrate writing technologies in a generic tool. While some steps have been made towards that goal, for example in MS® Word, it seems that improvement is desirable. But generally, it can be concluded that positive evaluations are more important than negative ones.

The second strategy used to gather information on computer tools' appreciation by professional writers was to present them with statements each time they confirmed using a tool. The respondents could select one or more statements among the following: "I like using it", "I could not work without it", "I like using it, but can work without it", "I would like to know how to use it better", "It is difficult to work with it", and "I do not like using it". Results from this part of the survey are presented in table 6.

Table 6. Survey results for computer tools' appreciation, ranked by total number of responses.

	% Like using it.	Could not work without it.	Like using it, but can work without it.	Would like to know how to use it better.	Difficult to work with it.	Do not like to use it.	N
Word processors	28.7	43.7	11.0	14.3	1.0	1.4	575
Web search engines	28.9	58.0	4.5	8.5	0	0	553
MS® review functions	29.0	18.1	27.0	15.5	4.4	6.2	504
Electronic encyclopedia	40.3	14.9	36.3	5.9	0.2	2.4	424
Online reference materials	36.1	11.5	36.3	12.2	1.7	2.2	410
MS® spelling and grammar checker	30.7	13.9	34.8	9.1	1.5	10.0	378
File hosting services	32.2	16.6	26.3	15.9	4.7	4.4	320
Terminological databases	33.0	23.4	22.7	15.6	5.0	0	282
Correction software (WhiteSmoke® or Antidote®)	29.9	40.3	14.5	11.3	2.3	1.8	221
Blogs	37.3	12.3	34.3	9.3	2.9	3.9	204
Collaborative work platforms	26.0	8.3	26.5	20.4	13.3	5.5	181
Discussion groups	38.4	6.7	34.1	10.4	6.7	3.7	164
Mind mapping tools	23.0	4.9	34.4	31.1	6.6	0	61
Concordancers	40.0	34.5	16.4	9.1	0	0	55
Authoring memory systems	45.5	36.4	21.2	24.2	6.1	3.0	33
Total	32.1	25.7	23.9	12.4	2.8	3.1	
N	1393	1113	1036	538	122	136	4326

As we can see in the last row of this table, the most predominant assertion, all tools considered, is “I like using it” (32.1%). In second and third places, we have respectively “I could not work without it” (25.7%) and “I like using it, but can work without it” (23.9%). “I would like to know how to use it better” comes in fourth place with 12.4%. Finally, the two negative statements “It is difficult to work with it” and “I do not like using it” respectively represents 2.8% and 3.1% of all cases. If we compare this general distribution with individual results, we detect that for some tools, the negative opinions seem over-represented. First, while the assertion “It is difficult to work with it” accounts for only 2.8% of all cases (sixth column), it represents 13.3% for collaborative work platforms, 6.7% for discussion groups, 6.6% for mind mapping tools, and 6.1% for authoring memory systems. Second, while the assertion “I do not like using it” accounts for only 3.1% of all cases (seventh column), it represents 10.0% for the MS® Word’s spelling and grammar checker, 6.2% for the MS® Word’s review functions, and 5.5% for the collaborative work platforms. However, we have to take into consideration that, for these same tools, the positive assertions are in important number. For the authoring memory systems for example, “I like using it” represents 45.5% and “I could not work without it” represents 36.4%, two proportions higher than the general result (see last row). In light of this analysis, I am drawn to conclude that, overall, positive opinions about computer tools are more important than negative ones.

Last, but not least, the assertion “I would like to know how to use it better” (fifth column) represents 12.4% of all cases. Once again, these results suggest that a considerable number of professional writers would like to gain more confidence in using some computer tools. It is also worth noting that for at least five computer tools, this desire seems over-represented: 31.1% for mind mapping tools, 24.2% for authoring memory systems, 20.4% for collaborative work platforms, 15.66% for terminological databases, and 15.9% for file hosting services. In the case of the mind mapping tools, the authoring memory systems, the collaborative work platforms, and the terminological databases, this perceived need for training is corroborated by the fact that the reason “I do not know how to use this tool” was slightly over-represented, as we saw previously. To sum up, professional writers have different needs and different opinions about computer tools.

From a general perspective, the survey results put to light two contradictions. First, there seems to be a contradiction in the number of tools available, the desire (at least for some professional writers) to use more tools, and the feeling that they are already using too many of them. A second inconsistency is observed in the professional writers’ perceptions with respect to the quality of computer tools. As we have seen, more professional writers have positive opinions about computer tools than negative ones, and this conclusion applies to all tools listed in the survey. This doesn’t mean, however, that professional writers do not want their tools to be more effective. How could the professional writers’ experience with computer tools be improved?

Part of the response can be found in what the participants had to say in the last question of the survey: How do you envision the future of writing tools? 325 participants (out of 414) provided a comment for this non-mandatory question, which rendered a 15,000-word text. I have conducted a coarse-grained qualitative analysis of this data, which allowed me to identify five recurrent subjects: voice recognition, collaboration, integration of tools, user-friendliness, and training. Let me first present

some quotes for each subject and then I will discuss the implications of these "predictions".

Voice recognition:

> "I have great hopes for voice recognition software becoming more accurate and more efficient."
>
> "Voice recognition software (when perfected) will replace typing. This will speed up the process."
>
> "50-100 years from now technology will be implanted and activated by speech and thought".

Collaboration:

> "I see everything as being more collaborative and cloud-based."
>
> "[…] I also see the possibility of working simultaneously with collaborators as a plus."

Integration:

> "I work in a Microsoft environment. A tool that works better at integrating the various products would be useful."
>
> "I see further integration… I see mainstream platforms like Word acquiring and offering more software tools on their platforms, increasing their use but also hurting the innovative that created them in the first place."
>
> "I imagine compatibility of use between several tools will become more necessary but also more difficult to manage because it's difficult for hardware, software/applications and browsers to keep up with each other."
>
> "I think the most important thing is integration of tools. People try too hard to make the perfect writing tool but it's inevitable that some tools will be better at doing certain things than others. So there's a lot that needs to be done to improve how tools interact with each other."
>
> "A better interconnectivity of the tools, like Antidote into Word. Other tools should follow this example, to avoid using numerous tools." (translated from French)
>
> "I suspect that the integration of further functionality (e.g., reference information, expanded dictionaries, thesaurus, etc. as mentioned in this survey) is imminent, although not necessary to the completion of most writing."

User-friendliness:

> "In a way, software evolution should become increasingly more user-friendly and not be tied to updates for the sake of updating so that companies can sell new versions of the same system […]"

> "Yes it is important for different programs and file formats to work together. Features like track changes are brutal when you have to convert files or else prepare them for typesetting or publishing (electronically or in print). "Keeping it simple" is still the best policy. Thanks."

Training:

> "I think they will continue to get better and more interactive. The key is for employers to upgrade the systems running the software so the employee gets the most out of the system. Also important is keeping employees properly trained, so they can utilize all the functions available to them."

> "Like it always has been. Changes will be made, some of which I will like/find useful and some I won't. Either way, these change/evolution will require a learning curve / training which will take up my time but which is necessary in order to use the tools properly."

The qualitative analysis of the 325 comments suggests that professional writers will use more voice recognition software and collaborative writing tools. According to one participant, voice recognition software could even replace keyboards in the near future. However, in order for voice recognition to be successfully integrated into the writing process, some working environments will have to be adapted. For example, how could one possibly use voice recognition in a shared office?

The qualitative analysis also suggests that it has become crucial to reflect on the possibility to (better) integrate writing tools into one system. This suggestion is the more important that new writing tools are expected to be developed (Max, 2012). The integration of tools into a coherent system could reduce the tension between the desire to use more tools and the feeling that too many tools are already used. This evolution towards a unified writing system will not be without challenges. For example, research will have to address many questions such as: How do professional writers customize their writing environment? What are the most popular combinations? What individual factors should be taken into consideration?

Moreover, user-friendliness of the tools seems like an important issue, according to the professional writers. To quote one participant, the software industry should "keep it simple". In computer-related disciplines, researchers have been evaluating software and other tools for a long time. However, it seems that writing studies are being slow to reflect on the technological aspects of digital writing. Many research questions come to mind: What are the concrete affordances of existing as well as emerging computer tools? Do professional writers make unusual use of some tools? How could computer tools be more user-friendly?

Last, but not least, the qualitative analysis confirms that training should be considered as a predominant factor, not only to use new tools, but also to use more efficiently existing tools. In Canada, and possibly in other countries, pressure is put on universities to take responsibility for practical training. Whether we agree or not with this transformation of the university, we, as teachers, ought to give our students the necessary practical and critical skills in order for them to become effective and intelligent users of writing tools. Hopefully, the empirical data gathered in this paper can contribute, even modestly, to guide instructors and administrators in the implementation and use of technologies in writing classes (Kastman Breuch, 2002).

Conclusion

In this paper, I presented results from a survey conducted with 414 professional writers. Originally, the survey aimed to quantify usage, reasons for not using some tools, and appreciation of computer tools. Unexpectedly, the analysis revealed two paradoxical situations. First, there seems to be a contradiction related to the number of tools available, the desire (at least for some professional writers) to use more tools, and the feeling that they are already using too many of them. A second inconsistency was observed in the professional writers' perceptions with respect to the quality of computer tools. As we have seen, more professional writers have positive opinions than negative ones about computer tools, and this conclusion applies to all tools listed in the survey. This doesn't mean, however, that professional writers do not want their tools to be more effective. For example, as we have seen with the qualitative analysis of the 325 comments, professional writers are concerned with user-friendliness.

In conclusion, the results presented in this paper certainly have implications for research. Considering that the industry will continue to offer new computer tools (Max, 2012) and that one of the professional writers' predominant concern is the integration of computer tools, it is my opinion that we need to think differently about the way we write with computers in the workplace. Instead of augmenting individual tools and forcing users to alternate between them when writing documents, couldn't we develop an innovative comprehensive writing system?

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