Doctoral Candidates' Academic Writing Output and Strategies: Navigating the Challenges of Academic Writing during a Global Health Crisis

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Abstract

Aim/Purpose	To date, few studies have investigated the impact of global health crises on the academic writing of doctoral candidates. This paper seeks to start a conversation about the impact of the ongoing COVID-19 pandemic on doctoral candidates' academic writing output and strategies.
Background	This paper employs and analyses data elicited from surveys and interviews involving doctoral candidates from around the world. Data were collected during April 2020, at a time when government-mandated lockdowns and restrictions on movement were in full force in many countries around the world.
Methodology	Surveys were conducted with 118 doctoral candidates from over 40 institutions based in four continents. Follow-up interviews were carried out with four doctoral candidates enrolled in an Australian institution. A qualitative descriptive design, employing thematic analysis, is used to assess the impact of the COVID-19 pandemic on doctoral candidates' writing output and strategies. The data analysis includes statistical descriptions of the surveys.
Contribution	This paper provides insights into the myriad challenges and obstacles facing doctoral candidates during the COVID-19 pandemic. It describes the writing strategies adopted by doctoral candidates during a period of significant societal disruption, and illustrates how thematic analysis can be employed in research involving global health crises.
Findings	Despite the adoption of novel approaches to academic writing, which appear in an insignificant minority of respondents, doctoral candidates' overall commitment to academic writing has been negatively impacted by the pandemic. Similarly, delays to academic research activities caused by the pandemic have resulted in a significant decline in commitment (motivation) to academic writing and a substantial impact on doctoral candidates' ability to write about their research.

Recommendations for Practitioners	Supervisors and mentors should strive to provide doctoral candidates with timely feedback during the pandemic. Given the impact of the pandemic on doctoral candidates' mental health and motivation to write, increased institutional and peer support is required to help doctoral candidates overcome academic issues during the pandemic and future health crises. This researcher recommends consulting regularly with and offering individually tailored solutions to doctoral candidates who are struggling to work on their theses during the pandemic. Similarly, institutions should empower supervisors in ways that allow them to provide greater levels of support to doctoral candidates.
Recommendations for Researchers	Further research on the impacts of the pandemic on various academic cohorts, such as early career researchers (doctoral candidates, postdoctoral researchers, and assistant professors) and student cohorts (e.g., undergraduate and postgraduate), will clarify the extent to which the pandemic is impacting the academic writing of doctoral candidates.
Impact on Society	The pressure placed on doctoral candidates to produce quality academic writing seems to have been heightened by the pandemic. This has a range of adverse effects for the higher education sector, particularly administrators responsible for managing doctoral candidate success and the academe, which recruits many of its faculty from holders of doctorate degrees.
Future Research	Additional focus on academic writing of doctoral candidates during the pandemic is needed. Research should include randomised samples and represent a range of academic disciplines.
Keywords	COVID-19, academic writing, writing output, writing strategies

INTRODUCTION

The COVID-19 pandemic has had an unprecedented effect on the world economy, with agencies such as the International Monetary Fund describing the pandemic as ushering in the biggest economic downturn since the Great Depression (International Monetary Fund [IMF], 2020). One sector that has been heavily impacted by the pandemic is higher education, with many teachers and students having to abruptly stop instruction in the first four months of 2020 (Group of Eight Australia, 2020; International Association of Universities, 2020). Doctoral candidates, who represent a sizeable portion of newly recruited full-time faculty members and academics around the globe, have also been required to change their working habits and, in some cases, place their research on hold due to restrictions on movement and nation-wide lockdowns linked to the COVID-19 pandemic.

Recent literature on the impacts of the pandemic on doctoral candidates have been discipline-specific or written from a wellbeing perspective. Aydemir and Ulusu (2020) offer a cursory glance at the challenges and opportunities facing doctoral candidates in the fields of biochemistry and molecular biology. In a survey of 79 doctoral candidates engaged in the field of oncology, Dhont et al. (2020) demonstrate how working in isolation during the pandemic affects anxiety and depression among researchers. Abdellatif and Gatto (2020) concentrate on parenting and self-care among doctoral candidates during the pandemic, and argue that experiences of cultural differences during the pandemic can foster a sense of belonging and community.

While many doctoral candidates felt "stuck" during their candidature prior to the COVID-19 pandemic (Kiley, 2009), the climate of uncertainty created by the pandemic is likely to have an even greater effect on the research capabilities and writing output of many doctoral candidates. Similarly, disruptions caused by the pandemic may contribute to an increase in the numerous pressures and obstacles involved in academic writing and its development that have previously been identified by researchers (Aitchison et al., 2012; Cuthbert & Molla, 2015). This paper centres on data from a survey

and follow-up interviews investigating the effects of the COVID-19 pandemic on the writing output and strategies of doctoral candidates. A qualitative methodology is used to analyse the results of the survey and interviews in this study, and data are analysed using descriptive statistics and thematic analysis. The main research question this paper seeks to answer is as follows: How is the COVID-19 pandemic impacting academic writing output and/or the adoption of academic writing strategies among doctoral candidates?

LITERATURE REVIEW

Writing output has been studied by numerous researchers in the field of writing research. Studies revolve around theoretical frameworks, methodological innovations, and qualitative and quantitative applications of academic writing (MacArthur et al., 2008). The importance of acquiring and developing academic writing skills through practice during doctoral candidature has been a key focus within the field of academic writing for many years (Casanave & Hubbard, 1992; Kamler & Thomson 2006; Lee & Aitchison, 2009; Odena & Burgess, 2017). Current research points to the effectiveness of peer feedback in improving the quality of academic writing (Simonsmeier et al., 2020). Researchers have also conducted studies of the ideologies underpinning academic writing output (Dakka & Wade, 2019). During candidature, writing output is rarely limited to producing a thesis, but also involves producing written work for publication in academic journals and other outlets (Kamler, 2008; Pickering & Byrne, 2014).

ACADEMIC WRITING ESSENTIAL TO ADVANCES IN SCHOLARLY LITERATURE FROM DOCTORAL CANDIDATES

The growing contribution that doctoral candidates make through their academic writing output is also gaining recognition among scholars. For instance, Larivière (2012) likens advances in academic scholarship to standing on the "shoulders of [doctoral] students." While this observation may be oversimplified (it is easy to underplay the key role supervisors play in guiding students toward new insights), it is noteworthy in that it emphasises the contributions to knowledge creation and dissemination made through doctoral students' academic writing. It essentially states that writing output, throughout the candidature of a doctoral student, plays a crucial part in the cultivation of researcher identity and self-efficacy in ways that have long-lasting effects on academic disciplines (Kirkpatrick, 2019; Mantai, 2017, 2019).

Academic writing output is increasingly being equated with research productivity, turning academic writing into a demonstration of one's own value within academia (Huerta et al., 2017; Stanley et al., 2017). Nygaard (2017) challenges the quantitative approach to research productivity (i.e., systems of evaluation that calculate the number of publications researchers' produce) in favour of a broader definition of research productivity and academic writing. While academic writing output continues to be a vital part of doctoral training, the adoption of effective and sustainable writing strategies is equally crucial to the development of academic writing among doctoral candidates (Lee & Aitchison, 2009).

IMPORTANCE OF WRITING STRATEGIES TO SCHOLARS

Writing strategies have been the focus of educational scholars, writing research scholars, and scholars working in a host of disciplines (Pelias, 2018; Richardson, 1990; Thomson & Kamler, 2017). Caffarella and Barnett (2000) explore the efficacy of feedback and critique in the development of academic writing skills among humanities doctoral candidates. As a strategy for developing writing, feedback and critique allow doctoral candidates to share their knowledge and experiences of academic writing with peers and faculty, while also honing their written work in an iterative manner (Huisman et al., 2019). Mentors – typically faculty members – play a significant role in guiding doctoral candidates' use of academic writing and sound research methods (Roberts et al., 2019).

Another strategy identified in the literature is the absorption of disciplinary styles of writing through prolonged engagement with the academic writing conventions and habits of established scholars (Starke-Meyerring, 2011). This strategy promotes "sounding like" a scholar in the field while also finding one's voice, a highly important facet of doctoral writing (Botelho de Magalhães et al., 2019; Odena & Burgess, 2017). Prolonged engagement can be challenging, as even doctoral supervisors struggle to clearly express and explicate disciplinary writing conventions and habits (Paré, 2011).

At a number of institutions, doctoral candidates seek assistance from non-faculty members who are trained to help students with their academic writing (Padmanabhan & Rossetto, 2017). So-called "doctoral writing advisers" or "learning skills advisers" are becoming more common across universities around the world, and are often housed in writing centres or libraries to ensure equal and easy access among students (Mackiewicz & Thomson, 2018). Though research on the doctoral candidates' perspective of writing advisers is scant, advisers are a vital writing resource in the practice and development of writing strategies, as they are able to bolster the quality and quantity of writing produced (Fleming-May & Yuro, 2009; Libutti & Kopala, 1995).

WRITING STRATEGIES MOVE BEYOND THE INDIVIDUAL

Recent research into the writing strategies of doctoral candidates has moved beyond the individual academic writer and concentrates on writing groups as an effective strategy for improving the quality and quantity of writing (Aitchison, 2009; Aitchison & Guerin, 2014; Cahusac de Caux et al., 2017; Ferguson, 2009; Johnson et al., 2017; Li & Vandermensbrugghe, 2011). Writing groups provide doctoral students with opportunities to participate in a community of practice that fosters the development of scholarly identity (Guerin, 2013; Lassig et al., 2013). They also improve wellbeing (Beasy et al., 2020), and provide doctoral candidates with a space where they can safely share their concerns about and demystify the writing process (Maher et al., 2008).

Similarly, Papen and Thériault (2018) advocate the use of writing retreats for doctoral candidates as a means of improving academic writing and doctoral candidates' relationship with literacy. Paltridge (2016) describes the benefits of writing retreats as a strategy for increasing academic publications among doctoral candidates and academic faculty alike. Davis et al. (2016) make similar claims about the overall effectiveness of writing retreats, but stress the need to be more inclusive when planning retreats (e.g. by tailoring retreats in ways that consider the needs of part-time doctoral candidates). Petrova and Coughlin (2012) maintain that structured writing retreats foster the development of academic practices (i.e., writing) and identity among novice researchers.

SELF-REGULATION AS A CRITICAL WRITING STRATEGY

Researchers have also identified self-regulation as a key writing strategy for doctoral candidates (Odena & Burgess, 2017; Salani et al., 2016). Self-regulation is a broad umbrella term used to denote practices such as goal-setting, planning, keeping records, self-evaluation, and organising information. Within the literature on doctoral education, goal-setting, self-evaluation, and organising information have received significant levels of attention (Bair & Haworth, 2004; Mullen, 2011). An early study by Seijts at al. (1998) points to the need to incorporate goal-setting in doctoral studies programmes. Anecdotal evidence in Lindsay (2015) also highlights the importance of goal-setting within the context of doctoral thesis completion.

The ability to self-regulate is typically diminished during times of significant social upheaval. To date, few studies have investigated the impact of global health crises on the academic writing of doctoral candidates. The Organisation for Economic Co-operation and Development's Science Barometer 2020 may be the only rigorous study (in progress) that addresses the impact of the COVID-19 pandemic on academic research output (Organisation for Economic Cooperation and Development [OECD], 2020). However, the study is likely to overlook the impact of the pandemic on doctoral

candidates, since its main data gathering instrument (an online survey) fails to include "doctoral candidate" or "PhD student" as a self-identifying category; the status of doctoral candidates is subsumed under two broad categories ("scientist or researcher" or "other").

DOCTORAL CANDIDATES AND THE CHALLENGES OF COVID TO RESEARCH

While few studies focus exclusively on the academic writing of doctoral candidates during the pandemic, researchers have started exploring the impact of COVID-19 on the research capabilities of doctoral candidates. A Spanish study discusses the deleterious effects of the pandemic on academia, mentioning the vulnerability of doctoral candidates due to their living arrangements and access to adequate workspaces (Corbera et al., 2020). The authors ask, "How can we expect quality reflection or analysis from someone confined in a single bedroom, or who has had to change drastically her life and study routines?" (Corbera et al., 2020, pp. 192–193). Cheng and Song (2020, p. 1229) present anecdotal evidence that doctoral candidates "bear the brunt of the blow" in terms of disruption to research output and career development.

Issues surrounding completing dissertations in a timely manner have also been linked to the pandemic. For instance, an Indian study of 138 postgraduates demonstrated that over two-thirds of students experienced difficulties completing their dissertation during the pandemic (Upadhyaya et al., 2020). Work by the Student Experience in the Research University Consortium provides ample evidence that major depressive disorder and generalised anxiety disorder have increased among postgraduates since the start of the pandemic (Chirikov et al., 2020). The group that was most significantly impacted was "research doctoral" students, with over a third sampled (n=7,565) screening positive for major depressive disorder and close to 45% screening positive for anxiety disorder (Chirikov et al., 2020). Such findings have significant implications for doctoral candidates engaged in thesis work and research publication.

The pandemic may have generated some positive benefits for some doctoral candidates. A study by Danish and American researchers indicates that doctoral candidates, especially at the early stages of candidature, may be less susceptible to economic downturns and their effects on future academic career prospects (Haas et al., 2020). Similarly, doctoral candidates in the study indicated that they were able to manage their stress and that their academic departments were meeting their needs. However, the researchers concede the possibility that "students were still processing the consequences of COVID-19" (Haas et al., 2020, p. 19). Given that the bulk of data gathered by these researchers derives from a survey conducted in March 2020, it is likely that doctoral candidates were unable to accurately forecast the long-term impact of the pandemic on academia and the global economy.

This paper seeks to start a conversation about the implications of a global health crisis for doctoral candidates' academic writing output and strategies. The main aim of this study is to provide doctoral candidates and their institutions with evidence-based insights into the obstacles and challenges facing doctoral candidates worldwide.

METHODOLOGY

This paper adopts a qualitative methodology with a qualitative descriptive design using surveys and semi-structured interviews for data collection. The research question guiding the project was "How is the COVID-19 pandemic impacting academic writing output and/or the adoption of academic writing strategies among doctoral candidates?"

SURVEY DESIGN AND SAMPLING

Over a two-week period – April 14–28, 2020 – a survey consisting of 13 questions was sent to doctoral candidates around the world. Google Forms was used to create and administer the survey. The aims of the survey were twofold: to gather data related to doctoral candidates' experiences of the pandemic and to record the impact the pandemic had on academic writing. Respondents were

prompted to confirm their status as currently enrolled doctoral candidates, in addition to providing information about their institutional affiliation and area(s) of specialisation. Being enrolled at a higher education or research institution as a doctoral candidate at the time of the survey was the only eligibility criterion for the study.

Purposive and snowball sampling were used to recruit survey respondents. In early April 2020, details of the survey were shared on the social media platform Twitter. The author also shared details of the survey with university postgraduate associations in the United Kingdom and Australia, doctoral candidates at several universities in the United Kingdom and Australia, and faculty members at a university in Australia. The eligibility criterion was explained along with the details of the study. From the outset, the researcher made it clear that doctoral candidates were being sought to participate in a study. Once potential respondents were identified, they were invited to complete the survey and subsequently share information relating to the survey with other doctoral candidates (snowballing), with the intention of increasing the number of survey responses.

Three kinds of questions were employed in the survey: dichotomous, Likert response scale, and open-ended. Dichotomous questions (e.g., yes/no) were used to determine the respondent's status as a doctoral candidate. Questions employing a Likert response scale of 1–5 provided respondents with the ability to indicate the degree to which they (dis)agreed with a statement. Open-ended questions allowed respondents to express their opinions with the researcher in a free and unhampered manner. The survey questions and structure are appended to the paper (see Appendix A).

Descriptive statistics was used to analyse and visualise the survey results. Qualitative analysis was used to report dichotomous and Likert response scale responses. Braun and Clarke's (2006) thematic analysis, based on a six-step approach, was adopted in the analysis of open-ended questions, as it allows the voices of doctoral candidates to assume centre stage in the research. Braun and Clarke's six-step thematic analysis framework, as detailed in Kiger and Varpio (2020), centres on a recursive process of analysis employing the following steps: (1) familiarising oneself with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report (Braun & Clarke, 2006). The thematic analysis in this paper was conducted in an inductive and data-driven manner, allowing themes to emerge from the data generated by the survey and memos made by the researcher during various stages of analysis. NVivo was used to code data and analyse themes identified in doctoral candidates' responses.

INTERVIEW STRUCTURE

To elicit further feedback related to the potential impact of the COVID-19 pandemic, a semi-structured follow-up interview was conducted with doctoral candidates who had taken the survey. Interviews were conducted via the Zoom videoconferencing platform. A convenience sample was used to locate eligible participants. Interviews consisted of an explanatory statement and eight questions. The purpose and scope of the research was shared with participants, and consent to record and use interviews for research purposes was obtained from all participants prior to commencing.

Topics covered in the interview included academic writing support, writing strategies, attitudes toward academic writing, and the pressure to publish during the COVID-19 pandemic. Given the semi-structured nature of the interview, probing questions were asked to elicit elaboration where necessary. Participants were given the opportunity to digress in their responses. Semi-structured interviews were used because they generate richer data and insights, while also making interviews more flexible, than their structured counterparts (McIntosh & Morse, 2015). Questions used to guide the interview are appended to the paper (see Appendix B).

Braun and Clarke's (2006) six-step framework of thematic analysis (detailed above) was employed in interview analysis. Interviews were recorded in Zoom and transcribed verbatim. NVivo was used to code data found in the interview transcripts.

RESULTS

SURVEY

A total of 121 respondents completed the survey. Of those, three did not meet the eligibility criterion. Their responses are excluded from the following analysis. Descriptive statistics was used to analyse and visualise the data. For open-ended questions, thematic analysis based on Braun and Clarke's (2006) six-step framework was employed. The qualitative data analysis software NVivo was used to analyse all data generated throughout the project.

Institutional affiliation

At the time of the survey, respondents were pursuing their doctoral studies at a range of higher education institutions and research institutes around the world. A list of respondents' institutional affiliations is provided in Table 1.

Table 1. Respondents' institutional affiliations (arranged geographically)

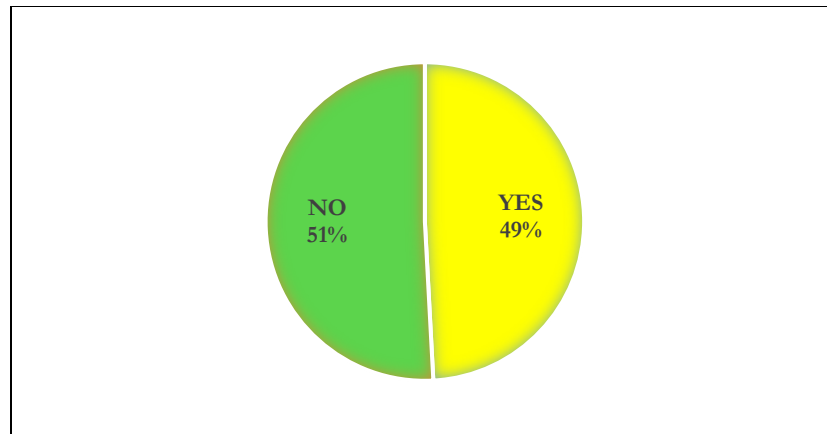| Country	Institution
United States of America	University of Alabama at Birmingham; Arizona State University; Boston University; University of California, Riverside; Colorado State University; Duke University; University of Kansas; Michigan State University; University of Nevada; University of Utah; Virginia Polytechnic Institute and State University
Canada	University of Alberta; Université de Montreal; Simon Fraser University
United Kingdom	Aston University; University of Birmingham; University College London; University of Edinburgh; University of Huddersfield; University of Kent; King's College London; University of Leeds; London School of Hygiene and Tropical Medicine; University of Nottingham; Staffordshire University; University of Southampton; University of Stirling; University of Warwick; University of Windsor; University of York; Queen Mary University of London
India	Indian Institute of Technology, Bombay; Indian Institute of Technology, Dhanbad
Malaysia	University Malaysia Sabah; Monash University Malaysia
Australia	Macquarie University; Monash University; University of the Sunshine Coast
Others	Trinity College (IE); University of Bremen (DE); Erasmus Medical Centre (NL); University of Lisbon (PT); University of Science and Technology (CN); The Graduate Institute, Geneva (IHEID) (CH)

Due to the specific nature of many respondents' research foci, areas of specialisation were divided into two disciplinary categories: humanities and social sciences (HASS) and science, technology, engineering, medicine, and mathematics (STEMM) (see Table 2). A detailed list of respondents' areas of specialisation is appended to this paper (see Appendix C).
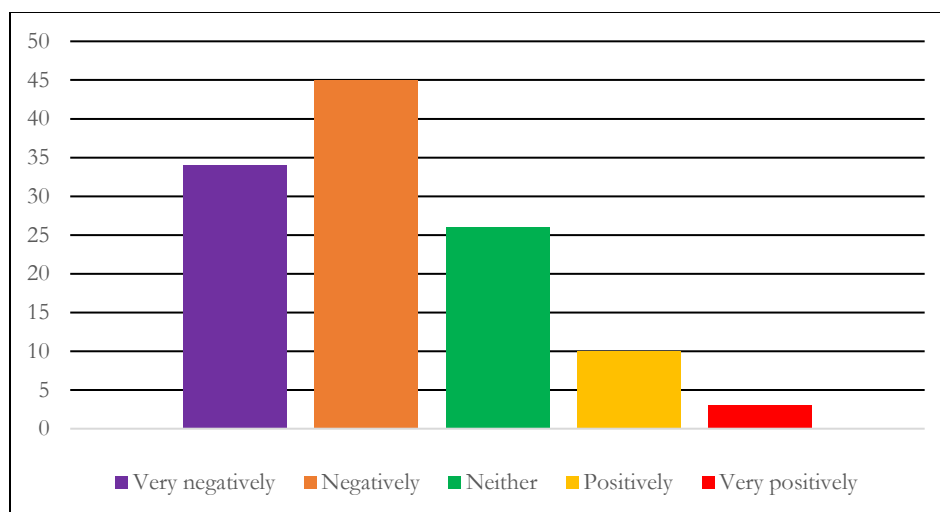
Table 2. Respondents' overarching disciplines

	HASS	STEMM
No. of respondents	83	35

Thesis submission, writing output, and writing strategies

Respondents were asked whether disruptions caused by the COVID-19 pandemic had resulted in a delay to their thesis submission deadline. Almost half of all respondents reported a delay to their submission deadline due to the COVID-19 pandemic (see Figure 1).
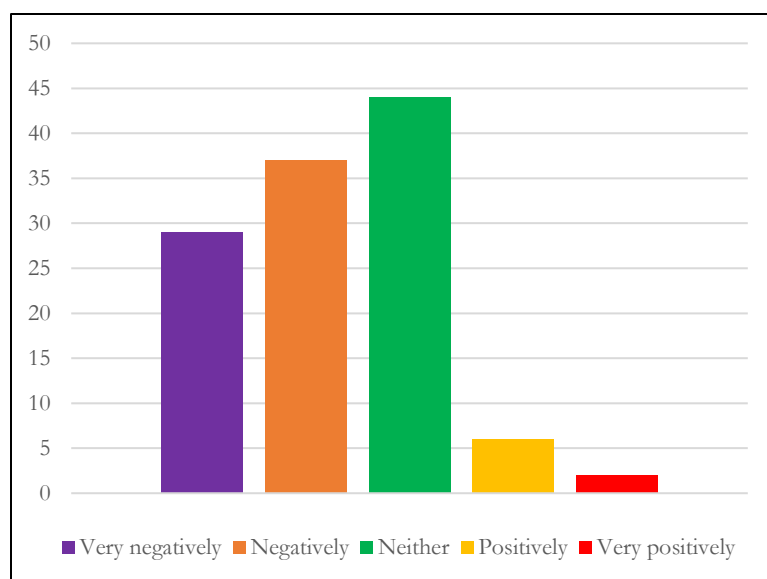
Figure 1. Delayed deadlines due to COVID-19

Respondents were also asked about their writing output and strategies since the start of the COVID-19 pandemic. The questions asked were as follows: "How has the COVID-19 pandemic affected your writing output?" and "How has the COVID-19 pandemic affected your writing strategies?" A Likert scale was provided, with respondents able to select between a value of one ("very negatively") to five ("very positively"). Over two-thirds of respondents reported that the COVID-19 pandemic had negatively affected their writing output, with only three respondents stating the pandemic had a "very positive" effect on their writing output (see Figure 2).

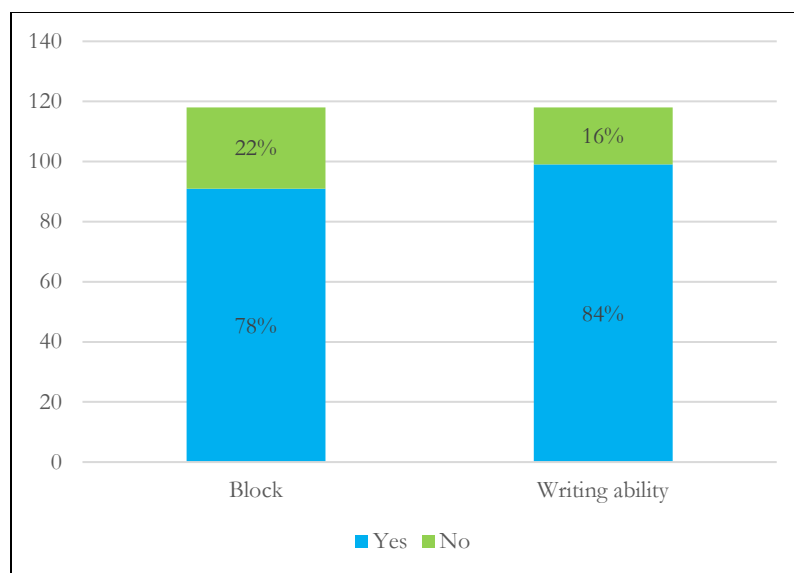**Figure 2. Impact of COVID-19 on writing output**

Over half of respondents reported that their writing strategies had been negatively affected by the COVID-19 pandemic. However, a significant proportion of respondents claimed that the pandemic had neither a positive nor negative effect on their writing strategies (see Figure 3).

Figure 3. Impact of COVID-19 on writing strategies

Writer's block and ability to write research

Respondents were asked whether they were experiencing writer's block or other issues writing about their research. The results are shown below (see Figure 4).

Figure 4. Impact of COVID-19 on writer's block and research writing ability

Most respondents reported that they had experienced writer's block since the start of the COVID-19 pandemic. Ninety-one doctoral candidates (78% of those surveyed) claimed they had writer's block. An even larger proportion (84%) reported that the pandemic had affected their ability to write about their research, indicating the significance of the disruption to academic writing caused by the pandemic.

Commitment to academic writing before and during the pandemic

Respondents were asked about their commitment to their academic writing before and since the beginning of the COVID-19 pandemic. Questions used a Likert scale, and ranged from a value of one ("not committed at all") to five ("highly committed"). The results are shown in Figure 5.

Figure 5. Commitment to academic writing

Compared to the pre-pandemic state, there was a steep decline in commitment to academic writing among doctoral candidates. While 76% of doctoral candidates (90 respondents) reported feeling either committed or highly committed to their academic writing before the start of the pandemic, a mere 27% of doctoral candidates (32 respondents) reported feeling the same way since the start of the COVID-19 pandemic.

Similarly, there was a sizeable increase in the number of doctoral candidates who did not feel committed to their academic writing. Compared to the pre-pandemic state, approximately 48 percent of doctoral candidates (57 respondents) reported feeling either not very committed or not committed at all to their academic writing. When contrasted with the pre-pandemic state, this represents more than a nine-fold increase in doctoral candidates who felt either not very committed or not committed at all to academic writing.

Writing strategies adopted since the start of the pandemic

Survey respondents were asked to elaborate on any writing strategies they had employed since the start of the pandemic. To this end, the following open-ended question was asked: "What strategies (if any) have you adopted since the start of the COVID-19 pandemic?" Based on an iterative analysis, several recurring themes were identified in the data (see Table 3).

Table 3. Writing strategies adopted since the start of the pandemic

Strategy Type	Specific Strategy
Scheduling chunks of time	morning after breakfast, two hours a day, Pomodoro Technique, Shut Up and Write!, virtual writing retreats, "snack writing," virtual writing groups…
Producing *x* number of words	writing a certain number of sentences, producing 1000 words a day…

Strategy Type	Specific Strategy
Goal-specific	finishing chapters, transcribing, writing reflective pieces, technical aspects of thesis, writing summaries
Do-or-die	write all day, "binge writing"…
Self-motivation	yoga, meditation, running, walking, hanging motivational quotes in room
Writing/working collaboratively	writing groups, virtual writing retreats, Shut Up and Write!
Minimising distractions/disturbances	turning off electronic devices, spend less time watching the news, spending less time on social media…
Securing space for writing	home office, writing on the floor, working in the laundry…
Emotional responses	anxiety, frustration, confusion, crying, despair…

Scheduling chunks of time was the most prevalent theme in the responses to this question. Doctoral candidates endeavoured to create time during the day for academic writing and thesis-related work. As one respondent states: "Morning is for writing. Treat writing as a job." Other doctoral candidates segmented work related to their academic writing output into "mandatory" thirty-minute "blocks," and some made efforts to write in the evenings because of family commitments. Doctoral candidates also made efforts to regularly set aside time for participation in virtual writing groups, writing sessions, and virtual writing retreats involving other doctoral candidates.

Another salient theme among doctoral candidates' writing strategies was being "goal-specific." In many cases, this meant producing a thesis chapter (introductory chapter, main chapters, etc.) or section of the doctoral thesis. In other cases, being goal-specific meant doing more "tedious work" such as transcription, data entry, and analysis.

A "do-or-die" writing strategy was also identified as a recurring theme among doctoral candidates' responses. This strategy included prolonged periods of writing (commonly known as "binge writing") and intensified use of the Pomodoro Technique. While this method was not as commonly reported as "scheduling chunks of time" and being "goal-specific," it demonstrates the urgency with which some doctoral candidates are engaged in academic writing. It may also signal heightened pressure to produce academic writing during the pandemic.

Doctoral candidates also expressed a range of emotional responses to the open-ended question about writing strategies. This theme was the second most prevalent theme (after "scheduling chunks of time"). A lack of concentration and inability to focus was reported by numerous doctoral candidates. In addition, candidates reported feeling distracted, anxious, depressed, and frustrated. One candidate claimed to be "staring at the computer in despair," while another was "trying to ignore … writing" until they were "mentally healthy." While not directly related to the actual adoption of writing strategies, emotional responses demonstrate the extent to which doctoral candidates may be experiencing difficulties adopting writing strategies (e.g., due to mental health issues) during the pandemic.

Lastly, several other themes were identified in the data. These include "producing *x*-number of words," "writing/working collaboratively," "self-motivation," "minimising distractions," and "securing space for writing." Some of these themes reflect the practical necessities of academic writing during the COVID-19 pandemic (e.g., staying in touch with peers, finding a suitable workspace, and avoiding external disruptions during government-mandated curfews and lockdowns), while others are linked to the writing output and wellbeing of individual doctoral candidates (e.g., writing 1000 words a day, doing yoga). An area of interest within the "writing/working collaboratively" theme is the vir-

tual writing retreat, which is mentioned by a minority of respondents in the survey. The use of technology to work collaboratively with peers in the relaxed yet structured parameters of a retreat makes it a novel solution to the academic writing issues that doctoral candidates associate with the pandemic.

INTERVIEWS

Four doctoral candidates from a Group of Eight university in Australia participated in individual follow-up interviews. Interviews were conducted using Zoom and lasted between 20 and 30 minutes. The names and institutional affiliations of interview participants have been anonymised for privacy and ethical reasons. For the purposes of this paper, the four participants will be referred to as P1, P2, P3, and P4.

P1 is a Caucasian domestic student conducting research in a HASS field. At the time of the interview, P1 was nearing the end of their doctoral studies and was close to submitting their thesis for examination. P2 is an international student of Persian origin conducting research in a HASS field. P2 had concluded half of their research and successfully achieved two of their three candidature milestones. P3 is a domestic student of East Asian origin conducting research in a STEMM field. At the time of interviewing, P3 was in the final stages of data collection (laboratory work). P4 is an East African international student conducting research in a HASS field. P4 was writing up their thesis, with the hope of producing a final draft for submission by the end of the year 2020.

Three recurring themes were identified in the interview transcripts. These are listed in Table 4.

Table 4. Themes identified in interviews with doctoral candidates

Thematic Category	Specific Themes
Focus and concentration [Ability to pay attention to ongoing tasks]	Inability to concentrate on writing, lack of focus …
Financial stability [Concerns, or lack thereof, about present and future monetary needs]	Current employment, future academic job prospects…
Delays [Waiting longer than expected for certain developments or outcomes]	Tardy feedback, postponement of calls for papers, thesis submission extensions …

Delays affecting the production of academic writing were a salient theme discussed by all interview participants. For instance, P1 shared their experiences of the effects the pandemic was having on getting in the "flow" and working efficiently.

> Now, because of the pandemic … my timeline's sort of been blown out a little bit, but also there's been huge disruptions to my work life … I'm having to balance … an academic job, so that's still part of my academic identity. Adapting that, whilst also adapting my PhD, has meant that I have very rarely felt relaxed and in the flow and focussed on the work. It's more of a scrambling just to get everything done.

P1 expressed frustration at the sudden need to "adapt" to new writing and work arrangements created by the pandemic. (At the time of interview, P1 had embarked on a research fellowship that required them to regularly write for publication.) However, P1 was also aware that these challenges were affecting many in academia, including supervisors. P1 notes this in their discussion of the timeliness of supervisor feedback:

> I have found that whilst they've been my primary support for my academic writing, in terms of the final stages of my PhD, I found that they have been a little bit slower than usual in providing me with feedback throughout this sensitive time ….

But I'm sort of giving them the benefit of the doubt, as well, it's that they're also trying to manage themselves in terms of their shift from the work-life balance.

Similar sentiments were echoed by P2, who felt the need to put collaborative academic writing on hold due to the pandemic's effects on the quality of their writing:

I think [the pandemic] degraded my writing. I wanted to start an article, which I was about to do … When I was doing my bachelor degree, I had a supervisor; he's in US now. He is a lecturer at university in … I can't remember the city. So, he asked me to write something and we'd planned something, and we wanted to start and I feel guilty that I'm not texting him to say that, "Okay, I won't be able to do that."

This delay to P2's plans to publish an article with a former supervisor was a source of guilt. Another source of guilt and concern for P2 was related to academic writing output during the pandemic. Despite feeling "positive" after losing and subsequently regaining academic employment at their university, P2 expressed concern at an inability to produce a draft of a paper they had planned. P2 compared this drop in academic writing output to the length of time it took to write during the start of their candidature.

Focus and concentration – also found within the "emotional" responses of survey respondents – was another prevalent theme among interview participants. Focus and concentration warranted selection as a theme due to the comparative lack of emotionally driven responses provided by interview participants. Three of the four interview participants touched on the effects of developments associated with the COVID-19 pandemic on their ability to focus and concentrate on their academic writing.

A mixture of temporal references was made by participants in relation to their academic writing. For instance, P1 and P4 discussed feeling more focussed before the start of the pandemic. Since the start of the pandemic, however, P1 felt like they were "throwing punches with [their] eyes closed, and just hoping that one of them is going to land." This attests to the difficulty of focussing on academic writing during the global health crisis.

P4 struggled to concentrate on their academic writing due to their preoccupation with the health and safety of loved ones. P4 gave the following response when answering a question about how they feel about their academic writing:

The outbreak [of COVID-19]. That's consumed some of your time. You can't help but thinking about the safety of the loved ones. That's reflected, in the time that I spend to writing on the concentration, it's sometimes very difficult to … concentrate while those things are going on.

P2 also encountered issues staying focussed while writing, despite the abundance of time they had to draft publications and write their thesis:

I feel I have abundant time. I have lots of time to start writing. Yet still I wake up at 7:30. I haven't missed my timeframe to start writing, sitting behind my desk. I haven't missed that, but my mind is not here.

For P2, an abundance of time and a predetermined routine did not provide them with the concentration and focus needed to write. Instead, such time was "consumed" by matters not related to writing (e.g., the outbreak of the COVID-19 pandemic).

Financial security was another common theme found in participants' responses. Anxiety surrounding future employment prospects in academia and current sources of employment were mentioned by three participants. For instance, P3 notes,

Certainly of course you need financial security or job security, to actually make you feel like you are surviving, at the same time you're making a difference, I think.

> Yeah, because some of my teaching roles, hours got reduced as well, and of course it affects the motivation of a researcher overall.

In the case of P3, financial security is directly linked to the motivation to conduct research. Another participant expressed concerns about the ability to find stable employment in academia after graduation. P1 made the following remark:

> If you hang around in any PhD space where students congregate … Well, I know, at least within the Australian context or even conferences, the one thing that everybody talks about is, are we going to get jobs? "Will we get a job? Oh, everything's so tough to get a job. What are you doing? You got to teach. You got to publish. How's your CV looking?"

P1 envisioned a state of heightened competition affecting their early career research trajectory. The participant linked this to a perceived increase in the need to publish to secure an academic position after graduating with a doctoral degree. Advice P1 had received from a mid-level career academic confirmed this view: "Just keep writing. Just keep writing. Just keep publishing. Even if you don't have a job, even if you're not getting paid, just keep writing, just keep publishing."

CONCLUSION

WRITING OUTPUT

Based on the results of the survey, the writing output of at least three-quarters of doctoral candidates has been affected by the COVID-19 pandemic (see Figure 4). The vast majority of doctoral candidates have experienced writer's block since the start of the pandemic. While writer's block is common among doctoral candidates (Lonka, 2003); the numbers reported in this study demonstrate the extent to which the pandemic may have driven a significant increase in the incidence of writer's block.

The findings of this study also demonstrate a noticeable decline in commitment to academic writing among doctoral candidates since the start of the pandemic (see Figure 5). Various factors contributed to doctoral candidates feeling less able to write about their research. These include a lack of focus and mental health issues, corroborating the findings of the large-scale survey presented in Chirikov et al. (2020). The pandemic poses a serious threat to the overall academic writing output of doctoral candidates and signals the need for intervention by higher education institutions and other stakeholders. While the short-term consequences may be manageable, it is important to note the potential long-term impact of the pandemic on attrition rates and the future shape of academia. Doctoral candidates require additional motivation and support to restore their commitment to academic writing. Failure to intervene in the near future may prolong the problem and cost candidates and academic institutions around the world significant time and money (in addition to other resources required to remedy the lack of commitment to academic writing).

The follow-up interviews indicated how delays in a range of academic activities (feedback, publication, collaborative research) caused by the COVID-19 pandemic have been detrimental to doctoral candidates' writing output. While extensions of thesis submission deadlines have been granted to many candidates, an inability to focus and concentrate on academic writing, coupled with mental health concerns, may have negated the efficacy of "stopping the clock." Universities and other stakeholders need to adopt additional measures to support doctoral candidates who are struggling to write during the pandemic. What shape or form such measures take depends on the context in which doctoral candidates are conducting their research (e.g., disciplinary norms), as well as the stage of research of individual candidates (early, mid, and final). Doctoral candidates could certainly benefit from tailored solutions that take into consideration the obstacles to completion that they currently face.

WRITING STRATEGIES

Doctoral candidates are employing a range of writing strategies during the COVID-19 pandemic. Writing strategies identified in this study include scheduling chunks of time, being goal-specific, writing or working collaboratively, minimising distractions, securing space for writing, and self-motivation. While the majority of writing strategies identified in this study represent a balanced and healthy approach to academic writing, a number of excessive strategies are also being used. The use of so-called "binge writing" and "writing all day" by doctoral candidates creates unnecessary pressure and may lead to mental health issues that outlast the COVID-19 pandemic.

While the writing strategies employed by doctoral candidates may be enabling some level of progress in academic writing, a lack of focus and concentration is hindering candidates from reaching their full potential as early career researchers and leaders in their respective fields. The COVID-19 pandemic has cost candidates countless hours of writing productivity, despite their best efforts to self-regulate their behaviour through goal-setting and scheduling. As one of the interview participants states, doctoral candidates are throwing punches in the dark; they are making an effort to produce written work using a variety of writing strategies while simultaneously acknowledging that some of their strategies may be ineffective.

One writing strategy that is quite novel, but underreported in the data, is participation in virtual writing retreats. Securing opportunities to write from the comfort of one's digital device is an example of how doctoral candidates are overcoming structural and movement restrictions in ways that increase productivity, motivation, and a sense of belonging within the academe. This new mode of virtually-based group writing deserves further attention in the literature, as it may provide key insights into the ways in which future group writing may take place in academia.

A number of themes that emerged from this study have previously been identified in research on academic writing among doctoral candidates. For instance, anxiety and procrastination, in addition to writer's block, continue to feature in the testimonies of doctoral candidates, both before and during the pandemic (Chirikov et al., 2020; Levecque et al., 2017; Lonka et al., 2014). Fortunately, this pandemic has occurred at a time when increasing attention is being paid to the wellbeing and mental health of doctoral candidates within academia (Aitchison & Mowbray, 2013; Pretorius et al., 2019). Nevertheless, the "emotional responses" of survey respondents warrant an investigation of the correlation between mental health and academic writing strategies and output during health crises. A longitudinal study by Huckins et al. (2020) has already demonstrated links between the pandemic and rates of depression and anxiety among college students. The overarching theme here is that during global health crises doctoral candidates, who are typically under immense pressure to produce high-quality academic writing (Stoilescu & McDougall, 2010), are exposed to a decline in mental health and a drop in motivation.

Finally, another means of providing doctoral candidates with increased support during a health crisis may be through more regular and lengthy supervisory meetings and college- or discipline-based relationship building. Interview participants in this study note how tardy feedback from supervisors affects their motivation to produce academic writing. Recent research by Hill and Conceição (2020) found that a doctoral candidate's relationship with faculty supervisors has a significant impact on the progress a candidate makes. At an emotionally and economically challenging time, there is an ever-greater need for stronger student-supervisor relationships (Cassuto, 2020). Institutions must support their supervisors in ways that allow them to provide their doctoral candidates with meaningful and timely feedback, while also providing pastoral care (beyond thesis writing) that ensures a smooth and safe transition to gainful employment – whether in academia or beyond.

This paper has demonstrated the myriad ways in which the COVID-19 pandemic is impacting the academic writing output and strategies of doctoral candidates. Both academic writing output and strategies have suffered as a result of this global health crisis, with candidates reporting a fall in com-

mitment to academic writing and the adoption of unsustainable writing strategies. While the interviews analysed in this paper indicate a certain level of resilience among doctoral candidates, the emotional toll of the pandemic on academic writing is clear.

LIMITATIONS

The present study has several limitations. These stem predominantly from the research and sampling methods adopted in the study. Surveys and interviews rely on self-reporting by respondents and participants, which is highly subjective. One way to overcome the limitation of results based on self-reporting would be to conduct observational studies and longitudinal case-studies of doctoral candidates' writing output and strategies during the COVID-19 pandemic. While this paper represents one of the first global investigations of doctoral candidates' writing output and strategies during the COVID-19 pandemic, more research needs to be done to understand the impact of the pandemic on doctoral candidates and other researchers in academia as the global health crisis unfolds.

The second limitation stems from the sampling methods used in the survey. Due to the non-randomised nature of purposive and snowball sampling, it is difficult to estimate how accurately the sample used in this study represents the overall population. Therefore, these sampling methods need to be complemented by randomised sampling methods in future studies, to evaluate the impact of the pandemic on doctoral candidates more accurately.

The third limitation relates to the geographical representation of doctoral candidates' institutional affiliations. While this study received responses from institutions based in 11 countries spread across four continents, the overwhelming majority of respondents and participants were conducting research at Anglophone institutions in four countries: United Kingdom, United States of America, Canada, and Australia. Further research into the effects of the pandemic on doctoral candidates at institutions in East Asia (e.g., China and Japan), non-Anglophone institutions in continental Europe (e.g., Germany, France, and Spain), African and Central and South American institutions, needs to be conducted, in order to produce a global understanding of the impact of the COVID-19 pandemic on academic writing output.

Lastly, the majority of respondents in this study were writing their doctoral dissertations in HASS fields. Though a significant minority of respondents belonged to STEMM fields, future research needs to include the voices of a larger cohort of STEMM doctoral candidates. Upcoming research also needs to focus more exclusively on the academic writing of doctoral candidates during the pandemic and other global health crises, while making use of randomised sampling methods to capture a more representative spread of academic disciplines.

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APPENDICES

APPENDIX A: SURVEY

The Effects of COVID-19 on Academic Writing Output and Strategies

Thanks in advance for taking this survey.

This survey asks current PhD students about the effects of the COVID-19 pandemic on their academic writing output and strategies. Please take this survey if you are currently enrolled as a PhD student or doctoral candidate.

Any personal information you share on this survey is privileged. Your name, contact details, and any other sensitive information you provide will not be shared with a third party. The researcher will anonymise your information for publication purposes.
*Required

1. Are you currently a PhD student? *

    Mark only one oval.

    ◯ Yes
    ◯ No

2. What is the name of your university/ institution? *

    _____

3. What is your field(s) of specialisation? *

    _____

4. Has the COVID-19 pandemic affected your thesis submission date? *

    Mark only one oval.

    ◯ Yes
    ◯ No

5. How has the COVID-19 pandemic affected your writing output? *

    Mark only one oval.

	1	2	3	4	5	
Very negatively	◯	◯	◯	◯	◯	Very positively

6. How has the COVID-19 pandemic affected your writing strategies? *

    Mark only one oval.

	1	2	3	4	5	
Very negatively	◯	◯	◯	◯	◯	Very positively

7. Have you experienced writer's block since the start of the COVID-19 pandemic? *

    Mark only one oval.

    ◯ Yes

    ◯ No

8. Has the COVID-19 pandemic affected your ability to write about your research? *

    Mark only one oval.

    ◯ Yes

    ◯ No

9. What writing strategies (if any) have you adopted since the start of the COVID-19 pandemic? *

_____

_____

_____

_____

_____

10. In one sentence, describe your attitude toward your academic writing since the start of the COVID-19 pandemic. *

_____

11. How would you rate your mental health since the start of the COVID-19 pandemic? *

Mark only one oval.

	1	2	3	4	5	
Very poor	◯	◯	◯	◯	◯	Very good

12. How committed to your academic writing were you before the start of the COVID-19 pandemic? *

Mark only one oval.

	1	2	3	4	5	
Not committed at all	◯	◯	◯	◯	◯	Highly committed

13. How committed to your academic writing have you been since the start of the COVID-19 pandemic? *

Mark only one oval.

	1	2	3	4	5	
Not committed at all	◯	◯	◯	◯	◯	Highly committed

APPENDIX B: FOLLOW-UP INTERVIEW

Thanks for agreeing to participate in this study of the effects of the COVID-19 pandemic on the writing output and strategies of PhD students. Any information you provide is privileged and will only be used for research purposes. Please note that this interview will be recorded. In the event that parts of this recording are shared, I will notify you beforehand. You have the right to refuse the sharing of this recording with any third parties. You also have a right to request a copy of this recording for personal use.

Guiding questions

- How is your university assisting with your academic writing? (In terms of workshops, seminars, etc.) How effective is their assistance?
- Are there any support mechanisms you wish you had now, to help improve your academic writing? Who should be responsible for providing such support mechanisms?
- What about your academic life before the pandemic do you miss the most and why?
- What about your academic life before the pandemic do you miss the least and why?
- How do you feel about your academic writing overall? Have you had the chance to improve the quality of your writing since the start of the pandemic?
- Do you write to a broader audience or about things that are not directly related to your research? If so, when did you begin doing so and what do you write about?
- For those seeking a career in academia, do you feel the need to publish has increased, decreased or stayed the same? Explain why.

APPENDIX C: SURVEY RESPONDENTS' SPECIALISATIONS

Anthropology and Indigeneity
Anthropology (3)
Anthropology/Museology
Applied Linguistics (4)
Arts
Behavioural Neuropharmacology
Biochemistry
Biological Anthropology
Biology
Biomedical/Cell Biology/Neuroscience
Biotechnology, Structural Biology
Cell Biology
Chemistry
Children's and Young Adult Literature; masculinity in young adult fantasy fiction
Communication
Communications and Media Studies (2)
Comparative Literature

Corrosion protection of metals and alloys
Creative Writing - Literary and Cultural Studies
Criminology
Dentistry
Ecology
Economic History
Education (2)
Education/Youth Studies/Refugee Studies
Engineering
Environmental Sustainability
Film and Literature
Film and Media
Film and Screen Studies
Film Studies
Forensic Chemistry
Forensic Science
Forensics (2)
Gender
Health Science
Higher Ed Leadership
Higher Education
History (6)
History (Medieval)
History, Religion
Human Geography
Human Physiology
Information Studies (2)
Interaction Analysis
International Political Economy
International Relations Theory, Great Powers, Russia
International Relations, Gender, Peace and Security Study
Journalism
Kinesiology
Linguistics (4)
Literary and Cultural studies (2)
Literary Studies

Literature (2)
Media and International Relations
Media Studies (2)
Media Studies/History/Australian Broadcasting Corporation/Music/1940s to 1990s
Medieval Studies
Meteorology
Microbial diseases
Microplastics
Migration, diversity, inclusion
Mindfulness in creative arts practice
Molecular Biology (2)
Neuroscience (2)
Neuroscience and Biological Sciences
Nutrition Epidemiology
Peace and Conflict Studies
Pharmaceutical Science
Philosophy
Political Economy
Psychology
Psychology in Education
Research at institute of dentistry (non-clinical)
Social Epidemiology, and Medical Statistics
Social Psychology, Health Psychology
Social Science
Sociology (6)
Sociology & Criminology
Sociology/Social Justice
Speech Language and Hearing Sciences
Statistics
Stem cell research in kidney
TESOL/Sociolinguistics
Theatre and Performance
Theatre and Performance (Doctoral subject: Adoption Trauma)
Translation Studies (4)
Wildlife Biology

AUTHOR

Basil Cahusac de Caux is an academic and researcher who specialises in language reform, academic writing groups, and wellbeing in academia. He is the co-editor of *Wellbeing in Doctoral Education: Insights and Guidance from the Student Experience* (Springer Nature, 2019).