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Regular Article

"To discipline my writing process": How newcomers to open textbook development moderate affective states and sustain momentum while writing

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ABSTRACT

Despite the burgeoning presence of open textbooks in higher education and their influences on courses, learners, and teachers, few studies have tracked their production as it unfolds, and none have addressed authors' affective states and associated actions during open textbook construction. Open textbooks are freely available for use, and the length of the textbook genre and pressure to craft quality content may trigger emotional responses from authors during their creation, but without detailed accounts of open coursebook development from which to draw guidance, writers may resort to trial and error to sustain progress during their projects. To address the research gap and uncover insights that could be of practical use, this paper's authors utilized concurrent verbalization and interviews to document the creation of their first textbook, an open corequisite volume that stresses the growth of effective study skills in tandem with workplace and academic writing skills, designed for first-year university students. Corequisites combine remedial and credit-bearing coursework to offer underprepared learners in the United States scaffolded supports as they work toward university graduation. Qualitative content analysis of data collected during the open textbook project revealed the authors employed conceptual and spatial organizational strategies as precursors for writing efforts; considered the facilitative effects of writing times on their emotional conditions and capacity to craft textbook material; recognized the benefits and drawbacks of operating in prolonged flow states; and engaged in incubation and physical activity to sustain writing momentum. This study addresses how novice textbook authors manage the rigors of deliberate practice during coursebook construction, frames open textbook writing as an experiential learning opportunity for educators, and offers implications for materials development training and research. Its findings may be of interest to educators, textbook authors, and those who study materials development, writing, or expertise, regardless of national context.

1. Why does textbook-writing research matter?

Taking its cue from the opening line of Harwood's (2017) article, this paper contends that textbook-writing research is of consequence. It matters because textbook authors compose pedagogical artefacts that have the potential to shape education. In particular, textbooks may inform lessons, exams, assignments, and course organization (Harwood, 2022); reinforce the knowledge and skills students need to successfully demonstrate course learning objectives and prepare for their careers (Atkinson, 2013); and influence teachers' professional development (Mishan & Timmis, 2015). Their province is thus far far-reaching, though highly detailed investigations into their actual construction are scarce (Atkinson, 2021).

Scarce, too, are probes into open textbook construction: that is, research centered on how authors produce coursebooks with copyright terms that permit their free distribution and frequently allow for adaptation (United Nations Educational, Scientific and Cultural Organization, 2023). In recent years, open textbooks have proliferated in higher education contexts, and like their commercial cousins, they have the potential to greatly impact learning environments and users' experiences (see, e.g., (Cox et al., 2022, Jenkins et al., 2020, Jung et al., 2017, Wang & Wang, 2017, West, 2019); still, details of their actual creation are rare, apart from the few investigations that have sought to deconstruct open textbook-writing episodes as a way to trace authors'

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processes and identify findings that may inform other coursebook work (see Atkinson & Corbitt, 2022a, 2023a, 2023b). But such investigations have yet to examine writers' affective states during open textbook production, the centering conception for the current article.

Open textbook writing is a form of public writing that comes with its own particular stressors. Unlike their commercial counterparts, open textbooks do not rely on paywalls for user access, and their very openness is a factor that could inspire trepidation on the part of authors as they consider how their finished products may be perceived by a wide readership—essentially anyone who can access the books via the internet. The length of the textbook genre could also trigger anxiety as authors endeavor to produce clear writing and quality material for multiple chapters and simultaneously sustain drive. In addition, open textbook authors may serve as their own project managers, meaning they must oversee textbook progress and completion rather than share the responsibility with teams of editors and page designers, as is often the case in commercial publishing (see, e.g. Atkinson, 2021). Maybe unsurprisingly, the combined weight of these realities has the potential to color open textbook writers' affective states and associated actions, but a pressing question remains: how do authors operate within and moderate these states as they push forward toward textbook completion?

These observations resonate with the current article, which focuses on the emotionality of textbook-writing work. In particular, it addresses how two educators approached their first textbook project and managed to keep their affective states in check and sustain progress as they composed chapters. By concentrating on the emotional conditions and affiliated behaviors of open coursebook writers, the article offers a perspective on open textbook production thus far unaddressed in the research literature. Public writing is known to be a face-threatening act, as Kellogg (2018) acknowledged, and one rife with circumstances that may prompt affective reactions as authors pore over sentences and paragraphs and serve them up for public scrutiny. But how they balance internal and external responses during an extended writing project while still keeping publication and pedagogic goals in mind is a research area brimming with possibility, as forthcoming paragraphs explain. The article begins with a broad overview of the affective states and associated behaviors that professional writing work may prompt before concentrating more discretely on their manifestations during open textbook development.

2. The affective states and behaviors that accompany professional writing work

Writing scholarship has established the link between an array of affective states and professional writing work. Such work is carried out by individuals who use their writing skills to make a living and by those educators, scientists, and others who write on the job (Kellogg, 2018). Brand and Leckie (1988) gauged the emotions of professional writers, for instance, and found their moods largely remained stable whilst writing; they also generally held positive views of the writing process. Larson (2020) investigated the relationship between digital publishing and the working conditions and job precarity of romance writers and learned that while the publishing model offered them flexible work hours, they felt pressured to work continuously to sustain their livelihoods. Lois and Gregson's (2019) study of unpublished romance writers also revealed the affective tensions authors experienced when they tried to balance writing time with other career and family responsibilities, yet some of the participants viewed writing as a therapeutic activity and an escape from everyday stressors. Del Pilar Gallego Castaño et al. (2016) surveyed university foreign-language faculty about their feelings toward writing and discovered they attributed value to the activity but also perceived it as time-consuming and demanding. Among the academics in Boice's (1997) research, those classified as binge writers credited intense, extended writing episodes with feelings of euphoria and efficacy but also saw writing manuscripts for publication as grueling work. Roughly one-third of the 1223 university staff and students who responded to Sword et al.'s (2018) survey identified frustration as the primary emotion they associated with academic writing. While some saw frustration as a motivating force to spur their writing efforts, others expressed frustration with their writing behaviors, self-perceived writing inadequacies, and the limited time they had for writing tasks (Sword et al., 2018). Several eminent natural scientists in Rymer's (1988) study likewise expressed dissatisfaction, uncertainty, and even embarrassment with their writing processes; nevertheless, most expressed confidence in their written products and felt excited at the prospect of publication. The range of feelings associated with writing work can be perceived across genres and disciplines, as the literature reveals.

The professional writing scholarship has also addressed the affective results of writing in flow states of consciousness: those intrinsically motivating, wholly absorbing, enjoyable, and energizing states when writers have clear goals and internal or external feedback mechanisms in place, when the challenges associated with their writing tasks align with their capabilities, and when their thoughts stream rather smoothly into their written products (Larson et al., 1988). Lois and Gregson (2019), for example, explained that flow states encouraged the unpublished romance writers they studied to persist with their craft and gain enjoyment, fulfillment, and a sense of identity as they aspired to publication. One of the exceptional poets Beatty and Ball (2011) interviewed similarly described the feelings of confidence that resulted from writing in states of flow. Among the ELT (English language teaching) materials developers who reflected on textbook authorship in Prowse (2011), one commented on the captivating quality of flow and the resultant trance-like state that can propel and extend writing sessions—sometimes past the point of effectiveness, according to another ELT textbook writer, which can lead to sleeplessness and lethargy the day after. For skilled writers working in various domains, time can pass swiftly during periods of flow as language and thought occupy attention (Kellogg, 2018).

Writing research has also revealed that writing preferences and behaviors, which are often associated with affective states, are highly individualistic. One of the ELT textbook writers in Atkinson's (2020) investigation indicated she liked to write at home in the early mornings when she felt clearheaded and that she balanced those demanding sessions with less strenuous afternoon work on her books. In comparison, the ELT coursebook authors in Prowse's (2011) chapter differed widely with respect to their preferred writing times and locations, as did the academic researchers and staff who participated in Sword's (2016) study. Some of Sword's (2016) interviewees also needed segments of undisturbed time to concentrate on their writing projects and avoided distractions by managing their email response rates, while others scheduled writing sessions into their daily routines. Cloutier's (2016) interviews with researchers in the field of organizational studies also revealed the idiosyncratic nature of personal writing behaviors: one participant physically arranged notecards with points written on them to conceptualize her ideas for papers in visual form, for example. Corroborating Kellogg's (2018) point that many professional writers across domains develop ritual ways of working that prime their abilities to produce text, Cloutier (2016) also found certain authors had to clean their work spaces and arrange chunks of uninterrupted writing time before commencing projects. One textbook author in Atkinson's (2020) study planned her chapters in detail and likewise considered this step a necessary precursor to her writing work. Some of Cloutier's (2016) participants also commented on the value of incubating—purposefully taking time away from writing difficulties to devise solutions through unconscious effort—and indicated that incubation coupled with physical activity and relaxation could stimulate writing progress. Sio and Ormerod's (Sio & Ormerod, 2009) meta-analytic review indeed revealed that incubation can help effect solutions to creative problems, those ill-defined problems characterized by imprecise goals and an absence of pre-set solution pathways, such as can be found in writing projects. Both

poets in Beatty and Ball's (2011) study also combined incubation with physical movement to address issues they encountered while writing, as did the textbook writers in Atkinson's (2020) investigation. Two poets Beatty and Ball (2010) interviewed intentionally put aside their completed poems and revised them weeks later, a finding that again speaks to the value of applying cognitive distance to writing projects. In the same way that writing can engender various affective states, the literature reveals that writing approaches and tendencies vary widely.

3. A study of the affective states and related actions exhibited during open textbook development

The literature reviewed thus far speaks to a range of emotional conditions and associated behaviors exhibited by those who engage in professional writing work, but the research landscape can be broadened by concentrating on the affective states that manifest during the creation of open textbooks and how authors handle them. Open textbooks are open educational resources, which the United Nations Educational, Scientific and Cultural Organization (2023) has defined as digital or other materials that are designed to support research and instruction and can freely be accessed, distributed, and oftentimes adapted due to their public domain designations or open license permissions; open textbook production, moreover, falls within Kellogg's (2018) definition of professional writing work since faculty typically construct these knowledge products while employed by educational institutions. Despite the attention affective states have garnered in the professional writing scholarship, research has not focused on feelings and accompanying actions *during* open textbook development. Studies tracking in-progress textbook development are rare, and investigations of open textbook-writing sessions are rarer still (for exceptions, see Atkinson & Corbitt, 2022a, 2023a, 2023b), an observation that points to a discernible gap in the pedagogic materials-development literature.

An expertise framework offers a theoretical foundation for exploring open textbook development, and, more specifically, for investigating the feelings and related actions open textbook-writing sessions may prompt. Society recognizes experts by their outstanding performance in defined areas of operation (Johnson, 2003)—performance guided by extensive, organized knowledge bases that shape what experts perceive and how they interpret and use information for problem solving and skill building (Persky & Robinson, 2017)—and Atkinson (2020) used an expertise perspective to identify how two highly skilled ELT coursebook authors sustained deliberate practice whilst producing commercial textbook content. Expertise researchers have identified deliberate practice as central to expertise development (Ericsson et al., 2018); this form of practice demands full attention and energy directed toward effortful but achievable domain-pertinent tasks, intrinsic drive to engage in the tasks, repetition of those tasks, feedback on said efforts, and determination to make steady gains in performance over time (Ericsson et al., 1993). The participants in Atkinson's (2020) study used several intentional tactics to perform optimally during periods of deliberate practice and make progress on their coursebooks: of note, they outlined textbook content in various levels of intricacy prior to building it out and incubated as a means to solve confounding problems. As newcomers to textbook writing and, indeed, to open textbook construction, this paper's authors resolved to chart a path different from Atkinson (2020) by concentrating on the textbook-writing efforts of neophytes. Investigations of expert textbook writers' approaches are undoubtedly useful, but to expand knowledge of how textbooks are written in practice, possibly to improve training in materials development, we also need an idea of how novices engage with their work, a statement that reflects the training goal of expertise study more broadly (Gobet, 2018).

Recognizing the lack of research focused on the intricacies of open textbook creation, including the feelings and related behaviors writers exhibit while completing projects, this paper's authors used concurrent verbalization (thinking aloud) and pre- and post-concurrent verbalization interviews to document the construction of their first book, *Mindful Technical Writing: An Introduction to the Fundamentals* (Atkinson & Corbitt, 2021), an open textbook developed for corequisite writing courses that enroll first-year university students. Corequisite models pair content-area instruction with tailored supports, such as study skills modules, and offer underprepared university students in the United States scaffolded routes to graduation (Daugherty et al., 2021); hence, the authors' corequisite textbook mingled learner training material with workplace and academic writing content. What distinguishes this study from other investigations of textbook production is its focus on novice textbook authors' affective states and accompanying actions as exhibited *during* the writing episodes that contributed to the creation of an open textbook. It offers inroads to understanding how open textbooks are developed in practice by writing instructors experienced at designing pedagogical materials for their classes but new to textbook production. This distinction is an important one since textbook writing is a protracted activity during which authors must consider audiences and contexts beyond their immediate locales. Qualitative content analysis of the authors' data revealed they employed multiple strategies to encourage writing momentum and textbook progress. These strategies subsequently facilitated the deliberate practice necessary to building textbook-writing skills, although they were not innate to the novice textbook authors who used trial and error to refine their approaches over the course of textbook development, a reality that showcases the experiential learning opportunities open textbook-writing projects offer and reinforces the value of documenting materials production as it unfolds so others might learn from writers' experiences.

4. Data collection and analysis[1]

Because the authors sought to document ongoing coursebook production, they used concurrent verbalization as their primary method of data collection. During a concurrent verbalization session, a participant orally articulates their thoughts while executing an activity to produce a think-aloud protocol (TAP) that is recorded, transcribed, and analyzed. The adjacency of this method relative to writing activity means it has the capacity to generate detailed and extensive data, making it a useful tool for undertaking writing process research, and studies such as Rymer (1988) and Berkenkotter (1983) evidence there is a long history of using concurrent verbalization to study the composing processes of writers producing various genres, but the tradition has yet to find widespread prominence in textbook-writing studies (Harwood, 2017). The extended length of the textbook genre could factor into this situation; indeed, writing process studies that use concurrent verbalization tend to concentrate on less lengthy types of writing: for example, journal articles (Rymer, 1988), language teaching tasks (Johnson, 2003), essays (Abdel Latif, 2019), and exam questions (Salisbury, 2005). Taking this point into account, along with their other workplace commitments and textbook project timeline, TWS (Textbook Writer Stacey) and TWD (Textbook Writer Dawn) decided to think aloud while writing two chapters each, those produced at the beginning and end of the project's lifecycle, to make data transcription and analysis manageable, and they read about concurrent verbalization and reviewed transcribed TAP data from Atkinson (2013) to become comfortable with the method before using it. The pressure to perform under researcher-recorded conditions for prolonged durations while composing and thinking aloud could also help explain why few textbook studies use concurrent verbalization. Some participants have expressed difficulty with this aspect of the method even when writing shorter texts, such as journal (Rymer, 1988) and magazine articles (Murray, 1983). In light of this consideration, as well as preferences regarding their writing schedules, TWS and TWD decided to audio record their own concurrent verbalization sessions. This aspect of the research design meant they could collect data during lengthy writing sessions, which sometimes occurred late at night or over multiple-day spans, and simultaneously make progress on textbook completion; it also meant they could compose in their homes and offices, locations where they ordinarily undertook writing projects, at their

convenience. Atkinson (2013), Berkenkotter (1983), and Salisbury (2005) similarly implemented participant-recorded concurrent verbalization to study writing practices. The authenticity of the writing project chronicled herein and locale for data collection speak to the ecological validity of the research, an important consideration when gauging affective states during writing sessions according to D'Mello and Mills (2014). TWS and TWD used interviews to supplement the think-aloud data, and they focused their semi-structured interview questions around writing plans, preferences, and proclivities.[2] All told, they conducted four pre-concurrent verbalization interviews, collected four TAPs recorded over several-day spans, and participated in two post-concurrent verbalization interviews to generate the 897 double-spaced pages of transcribed data presented in Atkinson and Corbitt (2022b).

Using qualitative content analysis, TWS and TWD applied codes to the data by parsing them into meaning units; they then determined how the codes coalesced into themes. They independently coded the data and then compared their work to establish agreement on codes, themes, and areas of analytic prominence. Because of the expansiveness of the data, their comparisons focused on transcript selections rather than every transcript page, and they undertook the comparison procedure twice: after they finished their first TAPs and associated interviews, and again after they finished the textbook and data transcription to refine their original codes and themes based on those emerging from the later data. External coders could not be hired because of project funding limits, so these measures were intended to encourage systematicity and trustworthiness in analytical practices. Like the open textbook authors, Salisbury (2005) both thought aloud and examined her dataset when researching test-item writing, and Hadfield (2014) collected and analyzed reflective diary entries to document her materials-writing practices. These examples evince a tradition of materials developers investigating their own work that establishes a research foundation for the current study (see also Atkinson & Corbitt, 2023b). Necessary precursors for writing, flow, and writing momentum emerged as salient themes during analysis,[3] as discussed herein; furthermore, affective states intermixed with these particular themes as the authors contended with the rigors of deliberate practice during textbook construction.

5. Necessary precursors for textbook development

Reflective of Kellogg's (2018) contention that professional authors often establish working conditions that prime their capacities to write and engage in the essential deliberate practice that leads to skill enhancement, the theme of necessary precursors for writing emerged as prominent in the data, and it could be glimpsed, for instance, in the authors' organizational strategies. To illustrate, during TWS's first pre-concurrent verbalization interview, the author mentioned the need to formulate a standardized design scheme prior to producing the textbook's "Integrating Graphic Elements" chapter:

> R[4]: do you have a plan for applying a basic design to the chapter?
>
> TWS: I have to have that (necessary precursor)[5] for it to come together (structure) so … [6] I'd build a basic … outline (planning tool) ….and … in terms of design (structure) probably just block it out in six sections (structure) … with an eye toward are these gonna work for the other chapters … I'm going to write (applies to all chapters).

Formulating a standard design configuration helped TWS conceptualize her chapter's development in instantiable terms and simultaneously consider how other chapters could be built, but the author acknowledged the strategy also gave her comfort and conditioned her capacity to proceed with chapter construction. During her second pre-concurrent verbalization interview, TWS again indicated that a precursory focus on design anchored and ordered her subsequent writing efforts: she thus used design "to discipline my writing process," as she remarked. TWS's need to establish a chapter design manifested as a conceptual planning operation that predated the creation of chapter text; TWD, in contrast, expressed the need to organize her physical space before she could erect chapters. In her first pre-concurrent verbalization interview, TWD discussed her practice of creating physical piles of resources as a planning mechanism "to get going" with chapters, as she put it (see also Cloutier (2016) for a discussion of authors physically arranging their materials and work spaces prior to writing), and during subsequent data-collection sessions, TWD reiterated the need to keep the piles intact and her desk clear to proceed with textbook production. Open textbook authors must craft ways to manage the cognitive and emotional demands incumbent to composing extended pedagogical artefacts over months, a challenge that necessitates the implementation of self-regulatory mechanisms, just as they are used by individuals producing other lengthy types of texts (Kellogg, 2022), and TWS and TWD regarded conceptual and spatial organization as precursors for chapter development and attendant deliberate practice sessions.

Time also emerged as a pronounced factor that impacted the authors' affective states and capabilities to proceed with chapter construction. For instance, TWS relayed during her first pre-concurrent verbalization interview that her capacity to realize creativity in her writing tasks—-that is, novelty produced in the service of an aim (Weisberg, 2006)—was linked with her ability to relax and that this positive affective state generally accompanied writing at a certain time of day:

> eight to eleven in the evening is generally my favorite time [to write] … it's the time when everything that is … going through my head all day long shuts down and … I start to relax and … I need to be relaxed to be creative.

Lee and Catling (2017) observed that problem-solving opportunities abound in commercial textbook production, but in contrast to a commercial textbook author who may write to fulfill the content and design criteria established by a publisher (see, e.g. Atkinson, 2021), open textbook writers are overwhelmingly free to set their own project parameters, a situation that may create ill-defined sub-problems to navigate on the way to textbook completion. Solving such problems demands creativity and focused vision, and for TWS, these conditions were predicated on relaxation, which meant writing at a certain time. During her first pre-concurrent verbalization interview, TWD also

[1] Atkinson and Corbitt (2022a, 2023a, 2023b) drew from the same dataset as this paper (Atkinson & Corbitt, 2022b) and also described the research design used, although those articles addressed different findings. The University of Montana's Institutional Review Board approved the investigation (IRB #102–19).

[2] The lists of questions TWS and TWD devised for the interviews can be found in Appendices A, B, and C. The authors developed the pre-TAP interview questions after reading the existing literature on commercial and open materials development. The post-TAP interview questions focused on their impressions of chapter construction and concurrent verbalization. For additional coverage of data collection and analysis during the project, see Atkinson and Corbitt (2022a, 2023a, 2023b).

[3] For discussions of other analytic themes detected in the dataset, see Atkinson and Corbitt (2022a, 2023a, 2023b).

[4] In the interview excerpts, *R* stands for researcher, TWD in this instance.

[5] To demonstrate how codes were applied to the data, they have been inserted into the first extended transcript excerpt for TWS and TWD presented in this paper. The codes are enclosed in parentheses to differentiate them from transcript content and are defined in Appendix D. A full list of codes and accompanying definitions for the entire dataset is beyond the breadth of this paper given the dataset's substantial size, ongoing analysis of its contents, and salient themes pertinent to other areas of analysis.

[6] Ellipses signify the omission of irrelevant transcript content (e.g., word repetitions).

discussed the relationship between time, her capability to produce textbook material, and her affective state:

> I have to have (necessary precursor) total quiet (music/sound) to concentrate (staying focused) so if I … can spend from … 5 'till 8 [a.m. on the weekdays] (time management) … before the students show up … I can be quite productive (progressing) … it's not necessarily my favorite time to write (self-assessment) it's the fact that it has to be (necessary precursor) totally quiet (music/sound) … but … on the weekends (writing experience) … I like to have … a very long sleep (sleep) and … start [writing] at 9 or 10 (time management) … after that refreshing sleep (sleep) … I can be quite productive (progressing).

TWD's preferred writing time was defined by atmospheric rather than temporal factors, and her ability to sustain concentration, a cognitive state that depended on quiet and recuperation, produced positive affective outcomes that enabled her to make progress on the textbook project. Similar to Larson (2020), Lois and Gregson (2019), del Pilar Gallego Castaño et al. (2016), and Sword et al. (2018) who found correlations between authors' emotional states and the time they afforded to writing projects, productive affective conditions and the need and ability to generate these—and engage in deliberate practice—could be traced to time in TWS and TWD's datasets.

6. Effects of flow on textbook development

An extended writing project such as an open textbook may place considerable demands upon an author's time and inner resources, as indicated herein, but the capacity to sustain full concentration during deliberate practice periods may also inspire flow, a state of consciousness associated with positive affect (Kellogg et al., 2018; see also Beatty et al., 2011; Lois & Gregson, 2019). TWD's dataset evidenced the effects of operating in a flow state. During her first pre-concurrent verbalization interview, TWD indicated she needed quiet to engender concentration while writing, as mentioned, but she also spoke of her tendency to write in lengthy stints once she achieved that facilitative condition, and her concurrent verbalization sessions verified the truth of this personal assessment: while composing a textbook chapter focused on academic integrity during her first TAP, she worked for nearly three hours, with one brief office interruption, before she concluded the session to teach a face-to-face class. When TWD recommenced writing after the office interruption, she made an introspective comment about the difficulty she had recalibrating her focus:

> I find it … difficult to only work for a couple minutes and then take a break and … try to come back to it I prefer to have a … long block of … uninterrupted time … to work … because … of my concentration … but I've got a couple minutes before class so that's why I'm doing this now.

Email interruptions could certainly derail TWD's concentration, and by the time she composed another chapter entitled "Writing to Persuade" and recorded a second TAP, she had reconfigured her writing habits to encourage concentration during periods of extended deliberate practice and the flow state that inspired textbook productivity and a positive mood. The impact of COVID-19 meant TWD's classes moved online, so rather than trying to juggle email responses, meetings, face-to-face classes, other employment responsibilities, and writing sessions, she rearranged her work schedule so that she handled everything non-writing related during the day and reserved nights for extended writing periods. During TWD's second concurrent verbalization session, she remarked that she had "been writing like crazy" as a result of the scheduling reconfiguration and later commented on the captivating nature of writing in an undisturbed flow state: "time flies … when you're engrossed in a writing project … I can work for hours and really not notice … how much time I've spent … I don't feel like it's a burden." The engrossing quality of flow (Kellogg, 2018) resulted in textbook progress and a desirable affective outcome for TWD, and, like some of the participants in Sword's (2016) study who reported managing their email replies and needing blocks of uninterrupted time to focus on writing projects, she adjusted her writing approach to reap its benefits and achieve sustained deliberate practice in the domain of open textbook writing.

While a flow state could stimulate positive results for TWD, the intense concentration extended deliberate practice sessions demanded and their reciprocal absorbing nature could also have less-than-ideal aftereffects, both physical and emotional. Several commercial textbook authors in Prowse's (2011) research reflected that flow can propel and extend writing sessions, sometimes past the point of optimum effectualness, as composition consumes consciousness and actions, and although TWD said she preferred lengthy, undisturbed writing sessions—as did writers in Boice's (1997) study who attributed feelings of euphoria to them—she sometimes struggled to disengage from the immersive experience of flow to rest in between the deliberate practice periods that accompanied textbook production. Her second TAP evidenced the reality of this situation as she began composing the "Writing to Persuade" chapter in the middle of the night and explored the reason for that circumstance:

> I'm a bit scattered … I worked on the book yesterday for … a long time. It was a good stint … And then … I was tired and I went to bed. And then slept … two hours and woke up at … silly o'clock in the morning so … I'm running on empty.

TWD also recognized the facilitative effects of sleep to her writing regime but acknowledged during concurrent verbalization that she would have to manage regardless: "Tiredness does play a part in … effectiveness as a writer … when I'm fresh I'm much more capable of producing effective content but … we just have to work with the situations … that arise." After making that comment and working on the chapter for 24 more minutes, TWD indicated she was "fading," so she concluded the writing episode at 5:54 in the morning. With the recuperating effects of sleep, she recommenced working on the chapter and wrote for another lengthy period that spanned 151 transcribed pages. As this sequence illustrates, self-recorded TAPs enabled capture of the strains to physical and emotional functioning that emerged during chapter production and exhibited how an author might need to mobilize stores of internal motivation, a key component of deliberate practice (Ericsson et al., 1993), to sustain a productive pace while completing an extended writing project.

7. Efforts to sustain writing momentum

TWS and TWD had a target publication date for their open textbook, and this deadline coupled with their other professional responsibilities meant time, progress, and writing efficiency consistently occupied their attention during chapter construction and inspired feelings of anxiousness. These interrelated attentional matters came to the fore in TWS's dataset, for instance, as the author discussed her conflict over wishing to revise her chapters indefinitely versus moving on to compose other chapters and the accompanying anxiety that resulted. After TWS finished the "Integrating Graphic Elements" chapter, she noted the difficulty in an interview response: "it is a challenge when … I want to finish this chapter and move to the next chapter … to be able to say … I'm done because … I'm never really done." One of the commercial ELT textbook writers in Atkinson's (2021) study similarly mentioned the struggle to resist perpetual revision of textbook chapters, although she acknowledged the role of editors in helping to curb this tendency. In contrast, TWS had to forge her own methods for maintaining progress on the open textbook to meet its rollout deadline and curtail anxiety, and during her second TAP, as she wrote a chapter entitled "Identifying Secondary Sources," she showcased a pair of techniques that counteracted her want to comprehensively overhaul material following its creation: coded as *return in future* and *incubate*. As TWS began crafting a

definition for *information literacy*, she consulted several Creative Commons-licensed[7] resources to solidify her understanding of the term's scope but became distracted by the embedded hyperlinks to other sources that also defined the term. "[I]t's so … easy to go down the rabbit hole," she commented during the TAP as she recognized the distraction; subsequently, TWS indicated she would "skip the definition and come back to it … at some point … so that I don't keep spinning my wheels," a situation that could cause writing stasis and engender frustration and nervousness as the deadline for textbook completion approached. After defining another vocabulary item, TWS returned to *information literacy* to produce a working definition and then signaled her intention to incubate in order to proceed with chapter development: "I'm gonna move on … and leave that [definition] to … simmer and maybe I'll change my mind when I get further into it [the chapter]." The working definition thus acted as placeholder text to establish a baseline for chapter inception, and TWS preemptively incubated to counter her desire to revise extensively post-chapter construction. By acknowledging her intention to return in future to the vocabulary item, a technique also used by two of the expert poets in Beatty and Ball's (2010) study, and incubate as a means to refine its definition, TWS established a focused target for possible revision and narrowed the extent of content that might ultimately need to be reworked. During a post-concurrent verbalization interview, TWS acknowledged the learning curve that accompanied her use of the return-in-future and incubation processes:

> I sometimes allow the … writing I've done to sit and then purposely go back and look at it … because it … works itself out … so I … can embrace that [feeling of never being done] a little bit better now … and just say … I'm really not done but I'm done with this draft of this piece and … it's time to draft the next piece and realize … I can always … at the right times go back.

The facilitative effects of the return-in-future and incubation processes accordingly helped TWS concentrate her revision efforts and mitigate anxiety to make progress on the textbook. Though she articulated during her second pre-concurrent verbalization interview that changing her writing procedure was "uncomfortable," TWS nevertheless demonstrated flexibility in the face of a new type of writing project with its acute challenges. To enhance their skill levels in a domain, Ericsson (2008) relatedly made the point that practitioners must be able to respond to dynamic task demands as they emerge.

TWS and TWD both used incubation during composing episodes, and as their project advanced, they intentionally employed the technique to manage the stressors that time, progress, and writing efficiency placed on their writing processes. More specifically, incubation created the thinking space they needed to resolve issues that arose during composing episodes—away from the intense concentration, central to deliberate practice (Ericsson et al., 1993), those episodes demanded—and stimulated a positive affective state that accompanied textbook progression. To illustrate, as TWS composed the "Integrating Graphic Elements" chapter during concurrent verbalization and considered the checklists[8] she might incorporate to scaffold students' success in preparing an incident report, she made notes about the items she planned to address; however, she said she encountered a "roadblock" as she tried to decide on the composition and focus for the checklists. TWS subsequently engaged the incubation process to clarify her ideas, and when she recommenced concurrent verbalization, she discussed the facilitative nature of incubation to her writing momentum and positive mood:

> I have … taken a break and given … more thought to the things … I identified as my action items in the last session … backed away from the … issue I was having with the checklists … I was … too close to that … in terms of not being sure what I wanted it [a checklist] to do and I think I've figured that out … so I'll … work out what those … items will be in that checklist it … doesn't need to be as big of a deal as … I was making it into.

As TWS "backed away" from the checklist matter by engaging the incubation process, she established the cognitive distance necessary to gain perspective and make headway toward chapter completion, a circumstance that inspired feelings of relief as she overcame her self-described "roadblock." Incubation could also be detected in TWD's first think-aloud protocol as the author endeavored to integrate case studies exploring varieties of plagiarism into the textbook using a cohesive design framework. Initially, TWD enclosed the cases in separate text boxes to distinguish them but then realized the boxes "looked very bitty on the page," making them "hard to follow." She could not decide how to address the issue during the writing episode, so she incubated as a problem-solving measure. TWD then decided to combine the case studies into one text box separated by headings to address the design issue, and in her TAP, she commented on the facilitative nature of incubation to her textbook-writing progress: "sometimes … you take a break and then you think oh that's a simple thing to fix … but you don't see it … when you're working sometimes so you just need … time away." Incubation can conduce solutions to ill-defined creative problems, according to Sio and Ormerod's (2009) research, such as those encountered during an open textbook project, and TWS and TWD recognized its value to chapter development and their associated emotional states.

The combined effects of incubation and physical activity in between intensive deliberate-practice sessions could likewise produce results beneficial to open textbook progress and the authors' affective conditions, just as the combination produced positive effects for the writers who participated in Beatty and Ball (2011), Atkinson (2020), and Cloutier's (2016) studies. In her first pre-concurrent verbalization interview, TWS listed the types of physical activity she found useful during incubation:

> for a break I will usually do something physical and probably think about the writing … and go back to it … I like [to] physically move around … that's what I generally need … mentally and certainly physically … I generally like … to do … an active meditation … a yoga pose or two … I try to listen to music while I do something like that … maybe walking a couple of blocks … [is] a useful thing … stretch … in general.

When composing the "Integrating Graphic Elements" chapter, TWS encountered the checklist matter mentioned in the previous paragraph, and she usefully combined incubation with physical activity to make headway on the textbook. TWD, in comparison, realized the beneficial effects of the paired approaches while bathing, and in the interview following her first TAP, she referred back to the previously mentioned text box issue and how a bath helped her tackle the problem:

> when I was writing that chapter [about academic integrity] it was quite broken up … I got stuck … and … had to get away from it and … I … had a bath and … maybe … it relaxes you or you're … disengaged from the other thing and … I remember saying … on the … recording … it came to me as something so completely easy to think of but sometimes when you're in those problems it's … hard to work out … how to proceed and taking that time away … sometimes helps.

The close proximity of data collection to writing episodes captured the realities of open textbook development for two novice coursebook authors and revealed the techniques they used to sustain writing momentum and encourage positive affect, including incubation intermixed with physical activity.

[7] These licenses allow copyright holders to release their pieces for open adoption and sometimes adaption by others with attribution (Creative Commons, 2023).

[8] The look and content of these checklists evolved over the course of textbook development. Appendix E presents a sampling of the checklist items TWS produced while drafting the "Integrating Graphic Elements" chapter.

8. Conclusions and implications

Textbook-writing work is infused with effort, challenge, and emotion; to sustain this work and the deliberate practice essential to skill building in the domain, an author must devise productive modes of operation and ways of moderating affective states so they do not derail forward momentum. To this end, the novice textbook writers who participated in this research used conceptual and spatial organizers to initiate writing sessions, tried to write when they were relaxed and focused, realized the positive and negative effects of operating in prolonged flow states, and employed incubation and physical activity to tackle the difficulties they encountered while writing. The intrinsic motivation and tenacity essential to deliberate practice and skill augmentation could be glimpsed in TWS and TWD's determination to make progress on the textbook by assessing the efficacy of their writing practices and adjusting as necessary to refine their techniques. This study bears out observations about the complexity of open textbook development made by Atkinson and Corbitt (2022a, 2023a, 2023b) and emphasizes the value of a flexible and intentional work approach for open textbook writers. TWS and TWD often used trial and error to establish productive ways forward with their project, but a study such as this one that examines writing episodes may reduce some of the uncertainty about how open textbooks are produced in practice.

The authors could not locate any studies focused on the affective states that accompany behaviors during open textbook-writing episodes, a gap that speaks to the broader dearth of research exploring coursebook production (Lee & Catling, 2017). The fact that concurrent verbalization remains an underused approach in coursebook development research (Harwood, 2017) coupled with efforts to rapidly prototype open textbooks to provide affordable learning resources may help explain the research void, despite the considerable presence of open textbooks in the educational landscape. Given the vitality of deliberate practice to skill building, it would seem that scrutinizing composing episodes as a means to understand how open textbook authors contend with its rigors, moderate affective states, and sustain momentum while writing is useful to encouraging a scaling up of open textbook development: if aspiring coursebook creators are given a view of the intricacies of open textbook authorship and witness how newcomers to the domain negotiate them, they might be more inclined to embark on projects, and embark on them armed with knowledge that might inform their own practices.

Open textbook production presents a dynamic experiential learning opportunity and a chance for educators to engage in the deliberate practice essential to skill building through projects with authentic situational parameters. Of course, such activity can be guided by contextual frames and materials development research, as this paper articulates, but the ill-defined nature of open textbook construction makes it a complex domain of operation, with affordances and constraints that authors must navigate en route to textbook completion. Its ill-defined character is indeed what makes open textbook authorship an exciting area for practical activity and empirical inquiry. The experiential learning opportunities present in open textbook production also speak to the endeavor being ripe with prospects for teachers' professional development, a point likewise raised by Atkinson and Corbitt (2022a, 2023b). By embracing the idea of open textbook production as a form of experiential learning, experienced instructors who have never written textbooks can reposition themselves as learners who make discoveries and gain skills through hands-on textbook development work. Open textbook authorship, in short, offers possibilities for knowledge and skill enhancement through challenge—processes central to expertise development.

Beyond the implications of this study for educators, it also offers implications for the research field of materials development, in particular through its use of self-recorded concurrent verbalization to investigate the writing procedures deployed during the creation of a bespoke, open textbook composed in situ. Atkinson (2013) commented on the value of participant-recorded concurrent verbalization to textbook research when studying commercial coursebook authors' writing processes, and the current study again bears out the efficaciousness of this approach, but in the context of an open textbook-development project. Concurrent verbalization is useful for bringing to the surface what may be unspoken operations and motivating factors (Johnson, 2003), and the research reported herein also reveals its usefulness in documenting participants' affective states and deducing how authors productively manage them during the course of an extended, and self-guided, writing project. The intimacy of self-recorded concurrent verbalization enabled capture of how two novice textbook authors negotiated with themselves to discipline their writing processes, engage in deliberate practice, and chart positive ways forward over the months that comprised their textbook project timeline. Self-recorded concurrent verbalization also provided a view of the interim stages of textbook production and the accompanying challenges that prompted physical and affective responses, such as when TWD began composing the "Writing to Persuade" chapter exhausted in the middle of the night after the residual effects of operating in a prolonged flow state affected her sleep, and thus offered a level of detail other data-collection methods may not be able to match—a claim substantiated in Abdel Latif's (2019) research. TWS and TWD's datasets indeed revealed the delicate balance open textbook authors must achieve between formulating a productive writing regime and exceeding the point of maximal effectiveness (see also Prowse, 2011). TWS and TWD used between-class breaks, early mornings, and late nights to make progress on their book, and many of these writing periods were impromptu as they carved time out of their days for writing work, a reality captured in their self-recorded TAPs.

Viewed through the lens of expertise research, the neophyte textbook writers' efforts to engage in and sustain rigorous deliberate practice during writing periods signaled their commitment to enhancing their skills within the domain of open textbook writing. Further, their attempts to discipline their writing processes evidenced a desire to impose intentionality and structure on expansive and intensive writing tasks: for example, chapter production that spanned days and demanded concerted attention. Capturing the extent of TWS and TWD's efforts to sustain deliberate practice would have proven difficult if not impossible had it not been for the use of self-recorded concurrent verbalization since the method chronicled writing episodes that spanned lengthy periods over day and nighttime hours in different writing locations. Unlike the expert ELT coursebook writers who featured in Atkinson's (2020) study, TWS and TWD spent the length of their first textbook project trying to discover and hone personally productive writing practices in the domain; a look at the details of both groups' composing sessions nevertheless reveals intersections that hold meaning for materials development training: specifically, in the area of incubation. The experts and novices both employed incubation during periods of deliberate practice and realized positive effects on writing momentum and their emotional states as a result, and they, like the writers in Beatty and Ball (2011) and Cloutier's (2016) studies, usefully combined incubation with physical activity to amplify these outcomes. Communicating the facilitative effects of incubation (and incubation plus physical activity) to trainee teachers and open textbook-writing initiates seems a useful way to encourage their pedagogic materials-writing efforts. Teachers in training might also be asked to document a materials writing experience via self-recorded concurrent verbalization, transcribe their vocalizations, and compare their data with classmates to determine if and how they employed incubation, and if they did not, to identify times when incubation might have usefully complemented their practices.

9. A limitation and direction for further research

Without funding for research assistants, TWS and TWD were obliged to code their own data, a circumstance that may be considered a limitation of the study, though they did implement reliability checks into their coding procedures, as reported herein. Still, they recognized others might have coded the data differently given the interpretive nature of

data analysis. That TWS and TWD detected writing processes parallel to those found in other studies—for example, incubation and incubation coupled with physical activity (see Atkinson, 2020, 2021; Beatty & Ball, 2011)—helps strengthen confidence in their analysis, but future writing process studies focused on open textbook production might utilize independent coders. Coauthors working together on open textbook projects might also code each other's datasets to encourage further trustworthiness in analytic procedures.

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CRediT authorship contribution statement

Dawn Atkinson: Conceptualization, Methodology, Investigation, Data curation, Writing – original draft, Writing – review & editing, Funding acquisition. **Stacey Corbitt:** Conceptualization, Methodology, Investigation, Data curation, Writing – original draft, Writing – review & editing, Funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A

Questions: First Pre-Concurrent Verbalization Interview

1. Which chapter will you focus on during your concurrent verbalization session?
2. How do you intend to approach writing the chapter?
3. Do you intend to draw upon any outside resources when working on the chapter? If so, which ones?
4. How do you plan to use the outside resources?
5. Do you have a plan for applying a basic design to the chapter?
6. What considerations will you make regarding use of illustrations in your chapter?
7. Will your chapter contain live links to outside referenced materials? If so, which ones?
8. What assumptions will you make regarding the student users' software and technology for accessing the content?
9. When producing documents, do you typically plan extensively before beginning, begin right away, or plan while writing?
10. Will you use your typical planning strategy when working on the textbook chapter?
11. Do you foresee any challenges with the chapter you will be working on?
12. If you do foresee challenges, how do you intend to tackle them?
13. How do you typically write: in long sessions, short sessions, or somewhere in between? Do you like to take breaks or not?
14. Do you prefer to write at a certain time of the day? If so, what time and why?
15. Is there anything else you would like to add that we have not already discussed?

Appendix B

Questions: Second Pre-Concurrent Verbalization Interview

1. How has your work been going so far?
2. Have you been able to find and use Creative Commons licensed materials when developing your chapters?
3. What, if any, challenges have you faced in the process of writing? Were these expected or unexpected challenges?
4. To what extent have you thought about or developed design elements for the chapters and/or the book as a whole?
5. Have you changed your mind about any of the chapter topics insofar as any that should be added, changed, or removed?
6. Discuss how your process has evolved in terms of planning, drafting, supporting, revising, and/or other process steps.
7. Which chapter will you focus on during your next concurrent verbalization session?
8. How do you intend to approach writing the chapter?
9. Do you intend to draw upon any outside resources when working on the chapter? If so, which ones?
10. How do you plan to use the outside resources?
11. Do you have a plan for applying a basic design to the chapter?
12. What considerations will you make regarding use of illustrations in your chapter?
13. Will your chapter contain live links to outside materials? If so, which ones?
14. What assumptions will you make regarding the student users' software and technology for accessing the content?
15. Do you anticipate that you will use the same planning process as when you wrote your first chapter while thinking aloud? In other words, do you think you will plan extensively before beginning, begin right away, or plan while writing?
16. Do you foresee any challenges with the chapter you will be working on? If so, how do you intend to tackle them?
17. Do you anticipate that you will use the same writing approach as when you wrote your first chapter while thinking aloud? In other words, do you think you will write in long sessions, short sessions, or somewhere in between?
18. Is there anything else you would like to add that we have not already discussed?

Appendix C

Questions: Post-Concurrent Verbalization Interviews

1. Which chapter did you focus on during your concurrent verbalization session?
2. How did the chapter go?
3. What challenges did you encounter when writing the chapter?
4. How did you tackle the challenges?
5. Will you discuss how the concurrent verbalization went?
6. Is there anything you would like to add that we have not already discussed?

Appendix D

Code Definitions

The following codes were applied to the first extended transcript excerpt for TWS and TWD presented in this paper. The codes are alphabetized here for easy reference.

- Applies to all chapters = Applying textbook development principles, organizational structure, a design element, or content to every textbook chapter.
- Music/sound = Having music or sound in the background.
- Necessary precursor = Being unable to proceed with one thing until another thing is done or in place.

- Planning tool = Making an outline, list, or note; arranging resource piles; grouping information; referring to the textbook scope and sequence or design principles; printing outside resources; constructing a route map in a chapter introduction.
- Progressing = Spinning my wheels (trying to do something without avail and wasting time in the process); becoming frozen (being unable to produce textbook content); plowing through it (grinding out content); getting bogged down; getting stuck; figuring out a way forward; proceeding with work.
- Self-assessment = Giving an impression of a chapter, data-collection session, or moment during a writing episode; expressing self-awareness; experiencing discovery during the think-aloud process; expressing writing preferences.
- Sleep = Resting to recuperate.
- Staying focused = Encountering interruptions; disengaging from the writing; taking a side trip (digressing); going down a rabbit hole (pursuing a distraction); procrastinating.
- Structure = Referring to titles, headings, sections, or the textbook design framework within units, among units, within chapters, among chapters, or throughout the book.
- Time management = Establishing a writing schedule; setting or meeting internal deadlines; setting or meeting external deadlines; pre-setting time limits for writing-related activities; writing during a certain period of time; rushing; saving time for something; using chunks of time; staying efficient/productive.
- Writing experience = Addressing an aspect of writing experience; mentioning one's own approach as a writer.

When these codes are applied to the authors' first extended transcript excerpts, they speak to the influences of necessary precursors for writing and time on TWS and TWD's textbook project.

Appendix E

Checklist Items TWS Drafted While Writing the "Integrating Graphic Elements" Chapter

- Are the included graphic elements of acceptably high quality?
- Are the illustrations complete, including introduction in text and captions with labels and citations?
- Are the illustrations integrated in proximity to relevant/related text?
- Did the writer avoid including graphics that do not serve a purpose related to the text?
- Are the graphics precisely chosen or created for their purpose?

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