Tracing the Influences of Praxis on the Development of an Open Corequisite Writing Textbook

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Abstract:	Although retrospective project reports are common in the materials development literature, accounts of textbook writing sessions are rare; so too are accounts of open textbook production. Open textbooks are learning resources that are free to use and oftentimes adapt by virtue of their copyright permissions. The authors used concurrent verbalization and interviews to document writing episodes while preparing their first book, an open textbook devised for corequisite technical writing courses. Corequisite designs pair content courses with explicit skill-building modules as a means to support underprepared learners in higher education in the United States. Qualitative content analysis of the data revealed how teaching and other praxis influenced the open textbook's composition: in the authors' applications of technical writing principles, pedagogical reasoning skills, and non-teaching work. The findings may encourage open textbook writers to exploit their established composing practices and knowledge bases to proceed with textbook production. In addition, the article highlights the usefulness of concurrent verbalization to textbook research and identifies the various materials development opportunities open textbook projects provide. It also contributes to the under-researched area of textbook production by exposing the complexities of open textbook development and how two novice authors negotiated them during writing episodes.

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Abstract

Although retrospective project reports are common in the materials development literature, accounts of

textbook writing sessions are rare; so too are accounts of open textbook production. Open textbooks

are learning resources that are free to use and oftentimes adapt by virtue of their copyright permissions.

The authors used concurrent verbalization and interviews to document writing episodes while preparing

their first book, an open textbook devised for corequisite technical writing courses. Corequisite designs

pair content courses with explicit skill-building modules as a means to support underprepared learners

in higher education in the United States. Qualitative content analysis of the data revealed how teaching

and other praxis influenced the open textbook's composition: in the authors' applications of technical

writing principles, pedagogical reasoning skills, and non-teaching work. The findings may encourage

open textbook writers to exploit their established composing practices and knowledge bases to proceed

with textbook production. In addition, the article highlights the usefulness of concurrent verbalization to

textbook research and identifies the various materials development opportunities open textbook

projects provide. It also contributes to the under-researched area of textbook production by exposing

the complexities of open textbook development and how two novice authors negotiated them during

writing episodes.

Keywords: materials development, open textbook production, concurrent verbalization,

corequisite courses, technical writing, pedagogical reasoning skills, novice textbook authors

The Influences of Teaching and Other Professional Experiences on Commercial Textbook Writing

Pedagogic materials-development research has highlighted the formative connection between teaching experience and textbook production. The 71 geography textbook writers from seven countries who participated in Lee et al.'s (2021, p. 64) survey research, for example, consistently cited teaching experience as a necessary precursor for textbook development, and Hatch (2007) described how her organizational theory textbook grew out of her course notes and the feedback she received from students on her pedagogic materials, which helped to boost their intelligibility. Writing about psychology textbook production, Sternberg and Hayes (2018, p. 278) likewise explained that instructors may formulate ideas for new textbooks based on their experiences in particular courses and perceived gaps in the existing textbook market. In the English language teaching (ELT) realm, a number of teachers-come-textbook-authors have similarly noted the confluence of the two professional domains in their work. Swales (1995a), for instance, made the point that several of his textbook projects found their origins in his experiences of teaching and designing lesson materials for various EAP (English for academic purposes) courses, and he mentioned the challenge of transforming homegrown materials into cohesive, coherent textbook products (p. 132). Swales (1995b, pp. 9-10) echoed this sentiment as he touched upon his classroom work when recounting the genesis of an EAP textbook, acknowledging the difficulty of reconfiguring lesson materials inspired by the particularities of certain classroom contexts into textbooks for wide-ranging consumption. Buchanan ("An Interview with Heather Buchanan ELT Coursebook Author," 2021, p. 42) stressed that ELT textbook writers must consider teachers with backgrounds and teaching styles different from their own, a factor that again speaks to the link between teaching experience and textbook authorship. The authors Kiai (2014) interviewed also emphasized the role of classroom experience in ELT textbook writing: specifically, they drew connections between the two domains when discussing their efforts to design materials for target learner groups in Kenya, encourage students' interest in lesson content, tackle instructional challenges, and facilitate fulfillment

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of learning objectives. These selections from the textbook development literature all point to the interaction between classroom instruction and textbook writing.

Textbook production clearly requires that authors look beyond their immediate teaching contexts to conceive of textbook use in classrooms further afield. To do so, they may reference subject-specific content knowledge and textbook design principles, as the expert (highly skilled) authors who participated in Atkinson's (2013) study of ELT textbook writing demonstrated. These sources of insight and direction were crucial for TW1, one of the authors in Atkinson's research, as he produced an ELT textbook for European students with literacy, mobility, and learning difficulties, a student demographic he had no experience teaching; for TW2, the other author in the study, the referential frames enabled her to address textbook vetting criteria and textbook users' priorities, which she was familiar with after having worked as a teacher and teacher trainer in the African country where her textbook would be used.

To establish perspective for their projects, textbook authors may also draw upon pedagogical reasoning skills, specialized analytical capacities that are grounded in teaching work and have been shown to transfer to the domain of textbook writing (see Atkinson, 2021a). According to Shulman (1987, p. 15), these capacities are realized in teachers' actions as they transform subject matter into effective instructional tools through materials preparation, representation, selection, and adaptation for learner groups. Through these processes of materials transformation, a teacher, and by extension a teacher who is also a textbook writer, "moves from personal comprehension to preparing for the comprehension of others," which is "the essence of the act of pedagogical reasoning" (Shulman, 1987, p. 15). Purpose and clarity of instructional content thus take on new importance as textbook writers work towards ever-higher levels of abstraction to make their products user-friendly for wide audiences (Spiro, 2022, pp. 475-476). Applying Shulman's (1987) explication of pedagogical reasoning skills to materials development for language teaching, Richards (2010, p. x; see also Richards, 2015) indicated that these

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skills enable materials writers to mobilize texts and other resources as potential teaching artifacts, to identify the learning aims associated with applying the artifacts, to envision potential issues that might arise during artifact use and ways to address them, and to make logistical decisions regarding the artifacts for optimal classroom functionality. While recounting the development of a conversation textbook series for English language learners, Richards (1995, p. 95) said he called upon these pedagogical reasoning skills to inform the book's design. Pedagogical reasoning, added Kavanagh et al. (2020, "1.1. Pedagogical Reasoning"), is what connects instructional goals and actions.

If we acknowledge the relationship between teaching and textbook writing, it stands to reason that other professional experiences might likewise influence textbook production. Reid (1995, pp. 64-65), for instance, commented that writing two romance novels for publication heightened her awareness of the connection between readers and the accessibility of her writing style and that her attention to audience carried through to her work on an ESL (English as a second language) composition textbook. One of the participants in Atkinson's (2020) study drew a parallel between how he approached ELT textbook production and other forms of professional writing, commenting that he sometimes utilized a "systematic framework" to initiate text development and other times immediately began writing and shaped the work afterwards (p. 492). Sternberg (2017, p. 79), too, remarked on the congruencies between academic and textbook writing in the field of psychology by explaining that, in both instances, an author must attend to audience needs and expectations and present accurate information in an engaging and memorable manner. Though not specific to textbook authorship, Spiro and Dymoke (2016) also found points of consonance between poetry and academic writing when collecting reflective data from 17 authors: while penning both types of texts, the participants said they weighed authorial choices with readers in mind (p. 84), applied equal amounts of conscientiousness (p. 85), discovered new ideas through the writing process (p. 85), and remained ever conscious of the presence and effect of their inner editors (p. 86). Lastly, in research focused on geography textbook

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production, Lee and Catling (2017, p. 346) noted the correlation between knowledge of current events,

geography, and set curriculums and the development of effective case study material.

The Influences of Praxis on Open Textbook Production

The research reviewed thus far sheds light on the effects that teaching and other professional

experiences can have on commercial textbook writing, but similar factors can also influence open

textbook development. Open textbooks represent a category of open educational resources (OERs),

which the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2021) has defined

as

> teaching, learning and research materials in any medium—digital or otherwise—that reside in
>
> the public domain or have been released under an open license that permits no-cost access,
>
> use, adaptation and redistribution by others with no or limited restrictions.

Because models of open textbook development shift work traditionally undertaken by commercial

textbook writers and publishing teams onto university faculty and staff (Wang & Wang, 2017, p. 232;

West, 2019, p. 234), faculty authors may naturally trace the origination of new open textbook titles and

content to their teaching and related professional experiences. A perceived gap in the existing library of

available textbook offerings coupled with institutional need, for instance, prompted Schmid (2020) and

co-authors to initiate the design of an open engineering economics textbook that incorporated material

for a specific course taught at a Canadian university. In a similar vein, Finlayson (2020) developed an

open textbook for world regional geography based on her teaching notes, course goals, desired

pedagogic approach, and knowledge of target learner audiences. As these examples illustrate, faculty

authors can draw upon their teaching experiences when customizing open textbook material relative to

particular disciplines, classes, students, and educational contexts (Fisher, 2018, p. 411; Jhangiani et al.,

2016, p. 193; Schmid, 2020, para. 13; West, 2019, p. 227); if the open textbooks are made available in a

digital public repository for wider institutional consumption, they also offer authors a far-reaching

means to showcase their knowledge and skills (Todorinova & Wilkinson, 2020, p. 2). Trouche et al.

(2018, p. 4) added that the development of open textbooks and other OERs can also contribute to a

faculty author's personal collection of course resources, which reflects the bidirectional impact of

textbooks on teaching practices (Atkinson, 2021a, p. 614). Given that faculty authors bring their

knowledge of course content and teaching approaches to bear when writing open textbooks, Chadwell

and Fisher (2016, p. 127) stressed that instructor contributions are vital to open textbook publishing.

Few Studies Detail How Praxis Impacts Ongoing Textbook Construction

Although the materials development literature has established the relationship between

teaching and other professional experiences on textbook writing, few accounts have delineated *how*

other domains impact ongoing textbook production. This distinction is an important one since post-hoc

project reports, prevalent in the extant body of materials development scholarship (see, e.g., Finlayson,

2020; Hatch, 2007; Jhangiani et al., 2016; Schmid, 2020; Sternberg, 2017; Sternberg & Hayes, 2018;

Warriner & Morris, 2020), may overview influences in broad terms but omit the finer details that could

be instructive for those embarking on textbook projects of their own. In 1994, Johnsen (p. 304)

remarked that few accounts of textbook production reported on the actual processes involved in the

undertaking. A number of materials development researchers have since echoed the observation,

including Atkinson (2020, pp. 479-480), who focused on ELT textbook construction; Johnson (2003, p. 3)

and Tomlinson and Masuhara (2018, p. 117), who addressed ELT materials design; and Atkinson and

Corbitt (in press), who concentrated on open textbook production.

Of pertinence to the current study, Samuda (2005, p. 235) also commented that post-hoc

project reports rarely detail the knowledge bases materials writers mine when working, while Chang

(2020, p. 360) noted the limited body of research linking materials developers' specific writing

approaches with their pedagogic procedures. Atkinson (2021a) represented an anomalous case since it

drew upon concurrent verbalization data collected from two expert ELT textbook authors during writing

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episodes to discern the ways in which teaching and teacher training experience affected textbook

development. Expertise researchers—those who seek to uncover the behaviors and characteristics that

underpin superior human performance in particular areas of operation (Johnson, 2010, p. 217)—have

used concurrent verbalization to study various materials development activities, including textbook

evaluation (Johnson et al., 2008; Kim, 2010), exam-item writing (Salisbury, 2005), pedagogic task design

(Johnson, 2003; Samuda, 2005), and commercial textbook writing (Atkinson, 2013), and have valued its

capacity to capture the granular detail of participants' real-time operations. During a concurrent

verbalization session, a participant is asked to vocalize their thoughts while undertaking an activity in

order to produce a think-aloud protocol (TAP) that can be recorded, transcribed, and analyzed. After

using qualitative content analysis to analyze the expert textbook authors' TAPs, Atkinson (2021a, p. 2)

found that they called upon experience gained in the adjacent domains of teaching and teacher training

during writing episodes when activating pedagogical reasoning skills, invoking repertoire, negotiating

constraints, and solving problems. These instances of transfer from neighboring domains enabled the

authors to address unknowns regarding learners' characteristics, establish foundations for textbook

content, assess the necessity and appropriateness of textbook material, deliver useable resources to

students and teachers, and forge connections between textbook and exam content. The study revealed

that concurrent verbalization can afford insight into the range of intricate processes used during in-

progress textbook development, making it a useful tool in the quest to better understand the

complexities of materials writing work (Harwood, 2017, p. 272).

The Focus of This Study

The current study answers calls for process-oriented investigations of materials development by

examining how two novice textbook authors drew upon teaching and other professional experiences

while constructing an open textbook designed for use in corequisite course pairings of introduction to

technical writing and writing fundamentals. In particular, it responds to the perceived paucity of

empirical research tracking the processes used by writers during the ongoing production of open

textbook content (Atkinson & Corbitt, in press)—more specifically, the processes undertaken by

neophyte textbook authors—and contributes to the modest body of scholarship associating

"pedagogical frameworks for OER" with instructors' development of OER materials (Bradley & Vigmo,

2016, p. 284). Though the campaign to replace costly commercial products with open textbooks has

gained momentum in higher education in recent years due to the recognized impact of textbook prices

upon student success and welfare (see, e.g., Florida Virtual Campus, 2019; Nagle & Vitez, 2020;

Todorinova & Wilkinson, 2019), gaps in product offerings may impede open textbook adoptions

(Griffiths et al., 2022; Todorinova & Wilkinson, 2020). The authors perceived such a gap in the existing

catalog of open and commercial textbooks available and embarked on a project to create a textbook

focused on the development of workplace and academic writing skills in conjunction with effective study

skills that could be used in corequisite writing courses. For learners who place into developmental

university classes, corequisite models offer shortened routes to degree completion by combining credit-

granting courses with remedial coursework, removing the need to fulfill the requirements over multiple

semesters (Avni & Finn, 2019, p. 55).

Concurrent verbalization and interview data collected during the production of *Mindful*

Technical Writing: An Introduction to the Fundamentals (Atkinson & Corbitt, 2021) provided a close look

at the ways in which praxis influenced the authors' operations and, ultimately, the book's design,

offering a level of detail that may not be reflected in retrospective writing accounts, according to Abdel

Latif's (2019) research. Qualitative content analysis of the data revealed the authors designed material

that both communicated and reflected technical writing concepts, activated pedagogical reasoning skills

gained through classroom experience while composing, and called upon approaches developed through

non-teaching work—specifically, through supervising employees and composing workplace and research

documents—to devise textbook content with realistic contextual details and manage textbook editing,

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planning, and resource collecting processes. These findings underscore the usefulness of concurrent

verbalization to materials development research, and they may encourage other open textbook authors

to apply their standard composing practices and access diverse knowledge and skill sets to inspire

writing confidence and facilitate textbook direction and progress. This study also contributes to the

under-researched area of textbook production by exposing some of the complexities associated with

open textbook authorship, challenges the view that teachers inherently know how to write materials for

broad distribution as a result of their career choice (a topic also taken up by Hughes, 2022, pp. 512-513

and Samuda, 2005, p. 236), and characterizes open textbooks as resources ripe with materials

development opportunities.

Research Participants and Procedures

To gain insight into textbook development, as well as writing practices more generally, the

authors decided to collect data on composing processes when initializing plans for an open corequisite

writing textbook, and they approached the undertaking as newcomers to textbook production;

nevertheless, their other professional experiences contributed to their textbook writing efforts, as this

article reveals. Corbitt, hereafter referred to as TWS (for Textbook Writer Stacey), held a master's

degree in technical communication and worked in that capacity for 15 years while also teaching writing

and sociology courses before she transitioned into employment as a full-time university writing

instructor. When data collection began, she had taught for a total of 11 years, over the course of which

she had developed materials for use in her own classroom. Atkinson, referred to herein as TWD

(Textbook Writer Dawn), held a master's degree in journalism and a Ph.D. in applied linguistics and had

taught university-level EFL (English as a foreign language), EAP, and writing classes for a total of 15 years

when data collection commenced. She also designed her own lesson materials and investigated ELT

textbook development (see, e.g., Atkinson, 2013; 2020; 2021a; 2021b; 2022). The authors provide these

details in recognition of Lee and Yuan's (2021, Section 2.1) observation about the tendency to

characterize experts as omniscient and novices as the inverse, a perspective that contributes to a fixed rather than a developmental view of expertise.

Expertise studies may recruit both expert and novice participants (or experts, intermediates, and novices) to determine what characteristics and behaviors differentiate the groups, or they may focus solely on one group to derive meaning from their operations (Chi, 2006, pp. 21-22). In the case of expert/novice comparisons, metrics with socially ascribed importance, such as colleague recommendations, awards, or performance ratings, may be used to separate the groups, with the understanding that expertise is societally recognized (Johnson, 2003, p. 138). The current study, in contrast, used convenience sampling to identify participants: specifically, the authors collected data during their inaugural textbook project to explore novice textbook writers' operations. The investigation thus adopted a novice-only orientation, not unlike other textbook studies that have employed expert-only designs (e.g., Atkinson, 2013; 2020; 2021a; 2021b; 2022). Though experience cannot be equated with expertise (Johnson, 2003, p. 16), domain-relevant experience is essential to building expertise (Ericsson, 2018b, p. 745), which is why the inexperienced textbook authors in this article are referred to as *novices*. Nonetheless, we recognize the complicated nature of this label, particularly since open textbooks are overwhelmingly written by faculty authors (Vitez, 2018, p. 6), and these individuals concomitantly function in both teaching and textbook production domains. When comparing how published textbook authors and teachers who developed their own lesson materials operated as they wrote tasks for English language teaching, Samuda (2005) acknowledged that both groups of participants "share[d] task design as a sphere of professional activity," although the specialisms of the groups were different (p. 240). The implication is that overlapping knowledge and skill strands exist in teaching and textbook writing, a finding born out in the current study.

The authors researched their own textbook project, an approach not uncommon in the existing body of materials development scholarship, as accounts such as Hatch (2007) and Richards (1995)

illustrate, but the current study sought a novel perspective by tracking neophyte authors' operations *during* open textbook production. As a first step, the authors requested and received approval to proceed with the research from the University of Montana's Institutional Review Board (IRB #102-19). They then collected concurrent verbalization data by self-recording TAPs while each composing two textbook chapters—conceived early in the textbook's development and near its completion—over a series of days; this aspect of the research design was intended to encourage productive writing output since the authors could develop chapters at their convenience in their chosen work spaces while audio recording writing episodes. Atkinson (2013), Berkenkotter (1983), and Salisbury (2005) also used participant-recorded concurrent verbalization when investigating writing processes with productive results, and the authors anticipated the approach, coupled with the naturalistic sites for data collection and their self-determined writing project, would help mitigate the influence of the observer's paradox during recording sessions and enhance the veridicality of data gathered. They did however recognize that self-recording the TAPs could potentially influence the flavor of data collected, particularly during the early stages of recording when they were adjusting to the procedure of thinking aloud while writing. Regardless, they found that the tandem process became more normalized over successive data-collection sessions, an observation similarly made by one of the expert textbook writers in Atkinson's (2013) investigation. Concurrent verbalization has the capacity to document the intricate nature of textbook writing episodes in fine-grained detail—intricacies that reflective accounts of textbook production might miss (Atkinson, 2020, p. 480)—but TAPs can be lengthy and take considerable time to transcribe and analyze (Johnson, 2002, p. 148), and thinking aloud can likewise increase time spent on activities (Ericsson, 2018a, p. 196), which is why the authors recorded a limited number of TAPs for this study. To complement the data for purposes of methodological triangulation, they also conducted pre- and post-concurrent verbalization interviews to probe each other's writing preferences, approaches, and chapter plans.

The authors transcribed the think-aloud and interview data using a broad level of detail, meaning they focused on verbal expressions and noted laughter, yawns, coughs, and interrupting sounds, such as ringing telephones, in the transcripts but did not document further specifics since the research concentrated on the content of spoken language rather than its articulation. This approach aligned with Edwards' (2005, p. 321) contention that transcription conventions should reflect the focus of a study. By transcribing the data themselves, the authors gained an initial familiarity with the substantial data set, which totaled 897 double-spaced pages.

The authors used qualitative content analysis to scrutinize the data. Hence, rather than approaching the data set with an a priori coding list, they worked inductively by repeatedly reviewing the transcripts while looking for connections and outliers in their content and parsed them by meaning units: words, phrases, and sentences that conveyed meanings. Meaning units in the data were present at both manifest (surface) and latent (underlying) levels (Vaismoradi & Snelgrove, 2019, "Introduction"), and the authors tended to code (assign descriptive labels to) the data in this order, although the levels often intersected during recursive coding sequences. They applied the codes to both the interview and concurrent verbalization data, a factor that speaks to consistency and thoroughness in the coding process. As they coded, they looked for relationships amongst the codes that pointed to initial themes and made analytic jottings to record their conceptual understandings of the data, as Miles et al. (2020) and Saldaña (2016) recommended when describing qualitative analysis.

The authors met to compare the outcomes of their analytic procedures on two different occasions: after they finished their first TAPs and associated pre- and post-concurrent verbalization interviews and, again, after they completed their second sets of think-aloud and interview sessions. During the discussions, they focused on transcript sections rather than the entire data set given its substantial size, and their comparisons helped them further delineate salient themes. Since textbook project and funding parameters did not afford access to research assistants, these procedures were

meant to build systematicity and trustworthiness into the coding scheme and data analysis approach

used. While researching exam-item writing, Salisbury (2005) served as both investigator and participant,

and like this article's authors, she thought aloud while writing and analyzed her data set;[i] Hadfield

(2014) also operated as both participant and researcher when she generated and coded reflective diary

entries to document her composing processes while coauthoring a materials resource book for teachers.

These examples from the materials development literature evidence a tradition of authors researching

their own procedures that helps to establish the legitimacy of the current investigation's design. In this

study, the influences of other-domain praxis on open textbook development emerged as a salient theme

during data analysis, as the authors discuss here.

Technical Writing Concepts as Drivers for Textbook Content Creation

In their textbook, the authors stressed that technical writing prioritizes courtesy, clarity,

conciseness, completeness, correctness, coherency, and concreteness; envisions specific readers;

incorporates design to enhance usability; and infuses pragmatic purposes into various genres "to help

individuals perform workplace tasks, carry out a series of operations, understand concepts or research,

solve problems, operate technology, or communicate in a professional manner" (Atkinson & Raymond,

2021, pp. 6-7)—all characteristics they likewise emphasized when teaching technical writing courses—

and these attributes anchored textbook content creation as the authors articulated learning goals.

When TWS developed a chapter entitled "Integrating Graphic Elements," for example, she mentioned

her focus on learning objectives and how these were tied with technical writing concepts. Specifically,

she wanted to encourage students to select types of graphics based on their intended communicative

functions and give them guidance for incorporating visuals into texts, as she remarked during concurrent

verbalization:[ii]

"to recognize the rhetorical situation"[iii] (reviewing)…"in which illustrations (integrating graphics)

should be employed" (reviewing). So that's a learning objective (learning objective)…[iv] to figure

out when it's the right time (relevance of content) to use an…illustration (integrating

graphics)…those are things that…come from the way that I already try to teach this…topic

(teaching experience)…two learning objectives (learning objective)[v]…remain here that have to

do with the…correct (correctness) technical integration of illustrations (integrating

graphics)…we always say (teaching experience) don't just drop (correctness) a picture in this

document (integrating graphics) make sure…you have considered…the purpose (audience and

purpose) of the illustration (integrating graphics)…that you're gonna use (relevance of content)

…to further the…understanding (relevance of content) of the audience (audience and

purpose)…that objective (learning objective)…and then…the rest of it that comes along

with…the technical side (correctness) of using illustrations (integrating graphics) is going to be to

properly (correctness) apply captions…and then cite the sources (acknowledging sources) of the

illustration properly (correctness).

Similar to the authors in Kiai's (2014) study who connected their teaching experiences with their efforts

to address learning outcomes during ELT textbook creation, TWS indicated her learning objectives for

the chapter reflected her pedagogical approach in the classroom and key technical writing concepts,

which centered her ideas about chapter development. TWD likewise referred to technical writing

concepts when tying chapter material to learning goals, and she drew upon her teaching experience to

inform textbook production. She prioritized conciseness in textbook content, for instance, to exemplify

succinct writing for learners:

"While it is true that"…"I argue that"…Wait a minute. I'm gonna take out the second that

because it sounds ridiculous…with those two thats there…when we write materials…for

classes…we do this but just trying to model…for students what we hope…they can also

demonstrate so I don't wanna be overly wordy here.

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During this concurrent verbalization session, as TWD composed a chapter focused on persuasive writing

and created templates that students could use as frames for acknowledging counterarguments, she

indicated that pedagogy grounded her efforts to infuse conciseness—a central tenet of technical

writing—into the book to underscore its importance, and her pedagogical reasoning skills came into

view as she scrutinized the material she prepared relative to that objective. By using their pedagogical

reasoning skills, both authors operationalized technical writing concepts as learning goals during chapter

construction and thereby evidenced what Kavanagh et al. (2020, "1.1. Pedagogical Reasoning")

described as a connection between informed instructional aims and actions.

In addition to anchoring textbook content creation and associated learning goals, technical

writing principles could also be detected in the features TWS and TWD integrated into their chapters,

and they engaged pedagogical reasoning skills as they strived to represent instructional material that

was comprehensible to students (see Shulman, 1987, p. 16). Both authors focused on vocabulary, for

instance, to enhance the clarity of chapters, heighten the target learner audience's understanding of key

terms, and infuse pedagogic purpose and functionality into the textbook. "[I] learned to use vocabulary

as a…learning tool early on in…teaching," TWS explained during a pre-concurrent verbalization

interview, and when she composed the chapter on incorporating graphic elements, she tellingly used

vocabulary as a foundation for building out textbook content, as her TAP session illustrated:

> as I think about the learning objectives I keep coming into the…terms…I use all the time…in
>
> trying to teach technical writing…like audience and purpose…Clear concise complete correct
>
> writing those things just come into every conversation I have…in my classes…they
>
> become…second nature in terms of things…students are going to be familiar with.

TWS subsequently incorporated a key terminology section into the textbook chapter for the target

learner audience's benefit and included *illustration*, among other terms, in the vocabulary list. The

inclusion of this term caused her to list tables and figures as illustration categories, define those terms,

and provide examples of the two types of illustrations before she discussed the conventions for

integrating them into documents. Regarding her focus on vocabulary during the chapter's creation, TWS

commented during concurrent verbalization, "those are my terms...that's a place that I can...start." The

author, in other words, conceptualized her chapter's framework by applying her pedagogical reasoning

skills, which she developed through experience teaching technical writing, and built chapter content

using vocabulary as an instantiation tool to make the text clear, readable, and operable for users. TWD's

data also reflected a focus on vocabulary with these objectives in view. TWD activated her pedagogical

reasoning skills, for instance, when she italicized key terms to cue textbook users' attention to them; she

discussed the full rationale for this decision during a TAP session when she composed a chapter

centered on academic integrity:

> "Plagiarism is defined as using someone else's"…"text words ideas or visuals without
>
> acknowledging the source"…I'm gonna…italicize plagiarism because I'm defining it…I've been
>
> doing that throughout the chapters…[and] if instructors want to…develop…quizzes based on the
>
> reading…some of these terms…the students need to be familiar with them…it's…easy to
>
> recognize the terms when they're italicized…it's a working definition [of plagiarism] and
>
> then…later in the chapter…I'm gonna expand on that.

TWD thus employed italics to draw attention to key terms in the textbook and indicated she also used

the vocabulary items and their definitions to build out textbook content, similar to TWS. Furthermore,

she drew upon her pedagogical reasoning skills, developed through teaching and using educational

materials in the classroom, to envision how instructors might encourage students to engage with the

textbook and attend to language items central to writing development.

Technical writing concepts could anchor and influence textbook content; however, at times,

they could also complexify issues for the authors during textbook production. In these instances, the

writers again called upon their pedagogical reasoning skills, and their accompanying teaching

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experience, as they prepared and critically interpreted material for the textbook (see Richards, 2010, p.

x; Shulman, 1987, p. 16). When TWS composed the incorporating graphic elements chapter, for

example, she decided to integrate two checklists for students to reference as they created an incident

report deliverable with an illustration: the checklists focused on "requirements for success on the part of

the writer and the audience" she explained during concurrent verbalization. As TWS constructed the

latter checklist, she acknowledged during her TAP that she had not decided how detailed it would need

to be for the textbook's target learner audience:

> I'm really struggling with this section…how detailed does this need to be…my audience [is] 100
>
> level [first-year undergraduate] writing students and…these checklists need to…make sense…for
>
> [them]…I really have to think about the audience…for this document that I'm developing in
>
> order to explain to that audience how to think about their own…audience for
>
> documents…because…they're developing…an incident report…they have a specified audience
>
> but they may not have any direct real life experience with members of that audience.

This transcript excerpt reveals concurrent verbalization's capacity to capture the intricacies of a writer's

in-the-moment analytical processes during chapter construction. After thinking about the checklist issue

during a break from writing, TWS returned to the concurrent verbalization session with a pathway

forward that reflected her pedagogical reasoning skills:

> thinking of graphics being used to enhance or clarify a message…that's the appropriate way to
>
> put that…one of the overarching things…I address always with technical writing students is…the
>
> things…we practice and do are intended…to give them confidence in their ability…to develop
>
> good documents…And their ability to communicate clearly and…the graphic elements that are
>
> properly done will…help the audience…"gain confidence in the writer and the
>
> material…provided in the document."

Despite the challenge she encountered, TWS articulated that her experience in the classroom helped

her proceed with the chapter and address the key technical writing concept of audience with the

textbook's learner audience in mind, and she emphasized the purpose and clarity of her material, as

Spiro (2022, pp. 475-476) recommended, when troubleshooting. TWD also problematized textbook

content as she considered technical writing concepts and engaged her pedagogical reasoning skills to

negotiate challenges. When TWD thought aloud whilst composing the persuasive writing chapter, for

example, she discussed correctness in terms of producing textbook content in an ethical manner:

> when we…started this project I…anticipated being able to use…my in class lessons and turn
>
> them into content…But…with a lot of the activities I use in class I…pull from
>
> many…sources...and…I had to…revisit…my class materials and really transform them…so they
>
> could be used in a Creative Commons licensed textbook…having now…written quite a few
>
> textbook chapters one of the realizations is…it's not…just a matter of taking your in class
>
> lessons…and turning them into chapters.

Like Swales (1995a, p. 132; 1995b, pp. 9-10), TWD acknowledged the challenge associated with

reimagining homegrown course materials for inclusion in a textbook, specifically the ethical publishing

considerations that came into play with the open textbook project, and the work of making the textbook

appropriate for use in classrooms beyond her own. In both scenarios described in this paragraph, TWS

and TWD demonstrated that textbook writing represented applied pedagogy, and they took care to

ensure their book reflected the technical writing principles they stressed in classes.

Pedagogical Reasoning Skills as Catalysts for Textbook Development

Pedagogical reasoning skills helped steer the authors' efforts during textbook writing episodes,

as the previous section explained, but they also inspired textbook content creation. To illustrate, as TWD

developed the academic integrity chapter and endeavored to create a logical flow of information, she

encouraged learners to consider the meaning of *academic integrity* by first defining the phrase and then

asking them to translate the definition in practical terms. By mobilizing her pedagogical reasoning skills, she selected a personalized activity that students might find meaningful in order to represent a key writing concept (Shulman, 1987, p. 16). TWD also decided to integrate graphic organizers into the chapter in the form of blank text boxes to prompt learners' responses, and she discussed this approach during concurrent verbalization:

> "Having read through how others define academic integrity how would you interpret it…record your answer below"…I want them to actually do this and…I've read that using these…boxes…to encourage students to write their answers down…can actually encourage them to do that more so than just…posing the question and…leaving it for them to do or think about in their own heads…in…Virginia Samuda's…task design work…the person [she quoted] called these things [blank text boxes] structured stationery.

As TWD explained her rationale for including the "structured stationery" boxes (J. Ridgway, personal communication, as cited in Samuda, 2005, p. 245), she referenced her pedagogic objective for the formatting feature, as well as her own research into materials development, both of which helped to motivate and shape her efforts. Her pedagogical reasoning skills thus came into play as she prepared material and clarified its purpose (Shulman, 1987, p. 16). TWS also mentioned structured stationery during data collection, and during a pre-concurrent verbalization interview, she relayed that pedagogic usefulness, as well as a focus on chapter design, inspired her to include it in chapters:

> the design elements come into the process of…developing the chapters for me…I'm looking for students to engage while they're…reading a chapter…I have included some…text boxes for them to respond in…those are elements…that I've incorporated to some extent…for discussion purposes of using chapters during class.

TWD and TWS ultimately decided to incorporate the blank text boxes into every chapter to encourage learner engagement with ideas en route to a scaffolded progression of textbook material. When Samuda

(2005) investigated how participants constructed tasks for English language teaching, she commented

that such design detail—that is, "the provision of advance organisers and within-task 'thinking space'"—

evidenced an ability to thoroughly schematize materials (p. 245). In another instance of pedagogical

reasoning skills inspiring textbook content creation, TWD incorporated purposeful, varied repetition into

chapters to reinforce learners' knowledge and skills, a materials development approach supported by

Timmis (2016, p. 152) and used by the expert textbook writers in Atkinson's (2021b) study. TWD

indicated that pedagogical reasoning skills underpinned her efforts to infuse varied repetition into the

book, for example, as she thought aloud while composing the persuasive writing chapter:

> I find…when teaching…sometimes students…read chapters and…feel like…I don't need to go
>
> back to that information whereas…that information they're gonna need throughout their time
>
> in the class and…beyond. So I decided to use some…Creative Commons writing center
>
> handouts…as reminders…in each chapter…It's…that varied repetition because…students in the
>
> co-req…need…that reinforcement…of…essential skills essential knowledge…framed in different
>
> ways so that they meet it again and again and…the importance of the information is reinforced
>
> in their minds by meeting it again and again.

As TWD discussed her efforts to apply varied repetition to textbook chapters, she referenced her

teaching experience and knowledge of the textbook's target learner audience and employed

pedagogical reasoning skills to tailor textbook content for users: specifically, she selected and adapted

outside resources so they could be included in the book (Shulman, 1987, p. 16). TWD's knowledge of

materials development research and TWS's focus on design guided their writing efforts, but their

pedagogical reasoning skills, born of their teaching experiences and interactions with the textbook's

target learner audience, enabled them to conceptualize textbook coverage in pragmatic terms.

Other-Domain Employment and Writing Experiences as Touchpoints for Textbook Work

Teaching experience influenced how TWS and TWD produced textbook material, as explained

herein, but other-domain work also impacted open textbook development, specifically content

production. To illustrate, when TWS composed the integrating graphics chapter during concurrent

verbalization, she introduced a scenario to stimulate students' thoughts about the chapter's deliverable,

an incident report with a visual, and she called upon her employment experience outside the classroom

to flesh out the situation's details:

> this is a student intern…who has gone through…the safety orientation…12 hours of…small group
>
> education reviewing safety policy reviewing procedures…being tested on those and signing the
>
> statement that says I understand…and will be responsible for…adhering to and…enforcing all of
>
> the safety policies of the company…to give the students the understanding…of their sense of
>
> responsibility in this situation…and that's probably coming from my experience…in supervising
>
> interns…that piece…does lend some…credibility and…gives…insight…particularly for 100 level
>
> writing students who maybe haven't had that experience.

This data extract demonstrates how TWS called upon her other-domain employment experience to

instantiate textbook content by formulating true-to-life contextual details of a situation as a means to

inspire students' thoughts about the deliverable; it also shows the author's eye for detail and drive to

make textbook information relevant and meaningful to students, as textbook writer Sternberg (2017, p.

79) encouraged.

Influences of other-domain work could also be glimpsed in the procedures TWS and TWD

followed while writing the open textbook. Aside from composing the textbook and their own lesson

materials, the authors had also written various types of workplace and research documents throughout

their careers, and these experiences contributed to their work on the textbook. Like the authors in Spiro

and Dymoke's (2016, p. 86) research, TWS said during a post-concurrent verbalization interview that she

found it challenging to balance the effects of her internal editor with impending textbook deadlines, for

instance, a situation that was heightened by the open textbook model, wherein she and her co-author

shouldered the responsibility for completing the book rather than sharing it with a publishing team as

would be the case in a commercial textbook endeavor. However, she had encountered similar

challenges with other writing projects and invoked those experiences to guide her operations while

producing textbook chapters:

R:[vi]   Do you go more by your internal feelings of this is done as much as it can be or do

external forces help you to think this has to be done?

TWS: More often than not I stick with the internal thing...I have a pretty good understanding

of...how I progress versus how I procrastinate or...become immobilized and...I get a lot

of comfort from knowing that my history is...when I look back at something it's way

better...than I remember...I wrote...so I've kind of learned to trust that.

TWS indicated that she drew confidence from her established writing practices to proceed with the

work of creating an open textbook. Despite being a novice textbook developer, her existing writing

schema enabled her to function productively when fashioning textbook chapters. TWD likewise relied on

her standard writing procedures as she composed textbook material, and she discussed the facilitative

quality of her planning processes, in particular, at various points during data collection. She mentioned

planning, for example, during a pre-concurrent verbalization interview:

our scope and sequence...I found that...helpful...as far as getting an overall picture of...each

chapter...I do not typically plan extensively before writing...I might...gather resources and put

them into physical piles and that's how I sometimes start to plan...But I do tend to plan while

writing...so what I tend to do is...we're not talking about textbook chapters per se but I...use the

introduction...to plan the rest of the document.

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One of the textbook authors in Atkinson's (2020, p. 492) study sometimes performed little structured

planning before writing, similar to TWD, and shaped his text while or after producing it. During a

subsequent pre-concurrent verbalization interview, TWD indicated that she had maintained her typical

planning and text generation process throughout the length of the textbook project:

> I have been using…our textbook plan [scope and sequence] and…making notes…as I go along
>
> which is what I tend to do…And then…the process of drafting…I tend to read over things again
>
> and again…as I'm going along and then I revise as I'm doing that and…that also…helps to
>
> establish…a running jump into what's coming next…it's…the same way that I write…in other
>
> situations.

Kellogg (2018) observed the idiosyncratic processes followed by experienced writers and noted their

different pre-writing techniques: some contemplate and plan projects in considerable detail before

composing, whereas others draft text to formulate their thoughts and revise extensively while writing

(p. 418). TWD's processes aligned with the latter composition style, and she called upon her non-

textbook writing experiences to infuse structure and progress into her inaugural textbook project.

TWD also related her materials development research to her planning procedures, which again

exemplified how her other writing pursuits contributed to textbook development. As she thought aloud

when composing the academic integrity chapter, for instance, she referred to opportunistic resource

collection, an approach similarly used by one of the participants in Atkinson's (2020, pp. 495, 497) study

of ELT textbook production, and said the activity contributed to her planning process:

> I was looking for something for this chapter…and…found something interesting and then that
>
> led me to something else…what happened…is…one of my typical ways
>
> of…planning…I…formulate what the chapter will look like…in my head and…look for things…to
>
> plug into the chapter…I…think about my own research when I'm doing this…I was using…an
>
> opportunistic approach to looking at outside resources that can potentially be helpful.

Here, TWD interpreted and attributed meaning to her resource collecting procedures by likening them a technique used by an author in her textbook development research; by doing so, she provided insight into the multifaceted nature of a writer's planning processes. The data extract once again evinces the contributory nature of other-domain writing work on open textbook production.

Conclusions and Implications for Materials Development

Materials development research has established the effects of other-domain work on textbook creation (see, e.g., Hatch, 2007; Lee et al., 2021; Reid, 1995; Sternberg & Hayes, 2018), but few studies, apart from Atkinson (2021a), have indicated *how* this work impacts ongoing textbook production, and few have tracked authors' processes during open textbook-writing episodes (see Atkinson & Corbitt, in press for an exception). According to Hyland (2009, p. 155), our understanding of writing can be enhanced by learning about the influences of contextual experiences on composing activities, and this study contributes to the extant body of materials development scholarship by forging connections between textbook production and associated praxis to identify how teaching and other job-related functions influenced open textbook composition. The novice textbook authors who participated in the research called upon their other-domain experiences while writing, and those experiences ultimately shaped the process and product of open textbook construction. Samuda (2005, p. 235) observed that post-hoc reports of materials production may not communicate the degree to which content reflects writers' procedures; by studying authors' operations during in-progress textbook development and applying qualitative content analysis to their data sets, this study, in contrast, found that TWS and TWD composed textbook material that concentrated on and conveyed technical writing principles, engaged pedagogical reasoning skills to produce usable chapters with target student readers in mind, and drew upon non-teaching experiences to craft material using familiar writing processes.

Shulman (1987) made the point that "To reason one's way through an act of teaching is to think one's way from the subject matter as understood by the teacher into the minds and motivations of

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learners," and he delineated this transformational goal as involving several materials development

processes: preparation, representation, selection, and adaptation with student characteristics in view (p.

16). Pedagogical reasoning is at the core of these processes as the educator "[transforms] the content

knowledge he or she possesses into forms that are pedagogically powerful" (Shulman, 1987, p. 15).

Shulman's processes of transformation could be detected in the data collected from TWS and TWD, as

this article explains, and the formation of their open textbook was intricately tied to the authors'

experiences of teaching and producing technical writing and operating in professional situations outside

the writing classroom. TAPs afforded access to the authors' composing episodes and ultimately revealed

the influences that shaped textbook composition; hence, the study bore out Harwood's (2017, p. 272)

observation about concurrent verbalization's capacity to unearth the complexities associated with

textbook development.

This investigation indeed revealed some of the complexities inherent in open textbook

production, specifically the affordances and constraints associated with the publishing model (see also

Wang & Wang, 2017), and illustrated how two novice textbook authors utilized existing knowledge and

skills to address the challenges they encountered. Their open textbook coalesced around technical

writing principles in terms of concepts, contents, and features, and TWS and TWD engaged their

pedagogical reasoning skills and drew from professional experiences honed outside the classroom to

craft and refine the book's content for its corequisite learner audience. Technical writing hence

represented a centering construct that the neophyte textbook authors used to derive meaningful,

focused content. Aspiring open textbook authors might also build confidence in their textbook writing

capabilities by drawing insight from adjacent-domain activities in which they have found some level of

success. Although TWS and TWD were new to open textbook production, their data sets illustrated that

they did not produce textbook content in a vacuum; instead, their actions were inspired by relevant

professional activities, which fed into the pages of their book. Ericsson (2008, p. 992) and Hambrick et al.

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(2020, p. 16) have commented on the need to discern how variously skilled performers operate to gain a

true sense of the nature of expertise, a point that reinforces the value of the current study. Viewing this

study's findings from another perspective, textbook writing represented a tangible form of the

knowledge work that permeated TWS and TWD's job roles. The textbook, in other words, emerged as an

operationalized, visible form of the time and care they devoted to the work of teaching, researching,

and writing. The findings might thus encourage trainee or practicing teachers to think about the wider

implications of their professional experiences upon their lesson planning and materials development

practices and view the bidirectional influences of one upon another (see also Atkinson, 2021a, p. 614).

        Open textbooks, like the one TWS and TWD composed, provide opportunities for educators to

enlist their knowledge and skills in the creation of distributed knowledge products that can promote

student wellbeing and success (Nagle & Vitez, 2020), and they offer ready possibilities for a range of

activities encompassed within Tomlinson's (2012, pp. 143-144) definition of materials development,

including textbook evaluation, production, and customization. By choosing to adopt open textbooks, for

example, teachers have the opportunity to gain experience in adapting, supplementing, and localizing

the resources for their particular needs and teaching contexts, subject to the terms of textbook

licensing. The current study also demonstrates how gaps in product offerings can stimulate materials

writing efforts and inspire educators to mobilize their skill sets in the name of pedagogic need (see also

Schmid, 2020). At a minimum, open textbooks and other OERs enrich the resource collections available

to educators who wish to source and fashion their own compilations of materials for use in classes, and

they may simultaneously inform teaching praxis as those instructors consider how others craft teaching

and learning opportunities within textbook chapters (Lane & McAndrew, 2010, p. 956).

        This study also points to the convergence of materials development as a practical undertaking

and focus of empirical inquiry (Tomlinson, 2012, p. 144). As TWD's data set illustrated, textbook

research can inform textbook production and vice versa, and investigations such as this one that

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document unfolding writing sessions might inspire future materials projects as practitioners and

researchers explore the intricacies of composing episodes and consider their materials development

approaches in comparison. Atkinson (2021a, p. 614) drew a similar conclusion when researching

expertise in ELT textbook writing.

Although textbooks inhabit educational environments the world over, textbook production

remains persistently under-researched (Harwood, 2021, pp. 181-182; Norton & Buchanan, 2022, p. xix).

This gap in the empirical research landscape coupled with the unfounded assumption that all teachers

can compose pedagogic materials simply by virtue of their career path (see Hughes, 2022, pp. 512-513;

Samuda, 2005, p. 236) obscures the complexity inherent in a textbook's scope: that is, the dynamic

interaction between a textbook as conceived and deployed (Samuda, 2015, p. 278). As TWD articulated

during concurrent verbalization, creating a textbook is not simply a matter of transposing materials

created for a particular group of students in a particular classroom environment into chapters for other

learners and teachers to use. Rather, the scope of a textbook is ripe with intricacies an author must

grapple with en route to devising a clear, compelling, and usable product, and the current study

illustrates that educators can learn to create these pedagogic artifacts through involvement in research;

careful consideration of publishing parameters; and awareness of the interplay between textbook

elements, teaching experiences, and other professional experiences.

Professional development sessions centered around textbook evaluation, use, adaption,

supplementation, and design could also usefully complement or inspire these efforts. Bearing in mind

that materials development guidance is not a guaranteed feature of teacher preparation programs,

practitioners interested in textbook writing may also look to studies like this one for mentorship as they

plan and embark on projects. In her pedagogic task design research, Samuda (2005) raised the issue of

materials development training and the possibility of "creating multiple opportunities for non-specialist

designers to engage and re-engage with core design problems at progressively greater levels of

complexity" to enhance their skills levels, and she commented on the challenge of designing such a

training approach (p. 251). Open textbook development offers this possibility as textbook authors, both

novices and experts, wrestle with difficulties, negotiate intricacies, and establish ways to proceed with

their projects.

Limitations and Possibilities for Further Research

The extant body of materials development literature is peppered with retrospective accounts of

textbook production written by authors about their own projects (see, e.g., Hatch, 2007; Richards,

1995); the current study aimed to break from that tradition by tracking the influences of praxis on two

novice authors' operations during open textbook-writing episodes. The textbook publication schedule

and the researchers' aim to collect a manageable amount of data for transcription and analysis meant

they focused solely on the creation of four textbook chapters during data collection, which may be

construed as a limitation of the study. This limitation notwithstanding, the length of the TAPs collected

during the development of individual chapters speaks to their capacity to gather data that is rich in

detail and extent. For example, TWD's final concurrent verbalization session, during which she

composed a chapter on persuasive writing over several days, reached a length of 458 double-spaced

pages when transcribed. Taking into account the usefulness of concurrent verbalization in detailing

composing episodes (see, e.g., Atkinson, 2020, 2021a, 2021b, 2022; Johnson, 2003), other investigations

could gather TAPs over the lifespan of open textbook development to delve further into the particulars

of textbook production, as Atkinson (2013) did when researching expertise in ELT textbook writing.

The authors self-recorded their concurrent verbalization sessions, a technique that may have

impacted, to some degree, the veridicality of data gathered, as they have acknowledged. Indeed, the

initial TAPs do document the authors adjusting to the procedure of thinking aloud while writing, but the

extended nature of data collection helped counteract this issue, as did the fact that the authors

specified their own writing task for investigation. The authors also self-selected their work spaces rather

than attempting to write in a laboratory environment. In his pedagogic materials-development research, Johnson (2003, pp. 35-36, 40) complemented the face validity of this type of naturalistic design, a factor that inspired confidence in the current study's research procedures. Self-recording textbook development sessions also brought certain advantages in terms of capturing typical writing tendencies since it allowed the authors to compose at times that suited their schedules and preferences, sometimes over multi-day spans, and these extended writing sessions would have been challenging to document using other data collection techniques. The difficulty with investigating writing processes over the course of lengthy writing projects is to configure a research design that both tracks ongoing composing procedures and minimizes the influence of data collection on participants' standard ways of working, and this is a challenge that future textbook development studies may take up.

This study gathered data from participants during their first textbook writing endeavor; it is thus delimited in scope because it offers a view of authors' operations over a discrete period of time. To expand the perspective of materials development research, future studies might track writers' processes over multiple textbook projects to document the longitudinal aspects of their work, an approach that may reveal skill progression, as longitudinal studies of teaching expertise, such as Bullough (1989), Bullough and Baughman (1993, 1995, 1996), and Tsui (2009), have revealed. This article's authors indeed intend to take up the charge as they compose and collect data during another open textbook project, and the rich insights gained from their first textbook writing experience will no doubt lend momentum to the effort.

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Appendix

Definitions of Codes Applied to the First Transcript Excerpt in the Article

The following list defines codes that accompany the first transcript excerpt in this article. The list

has been alphabetized for ease of reference.

- Acknowledging sources = Document the source of information, words, ideas, and visuals; refer

  to common knowledge or boiler plate.

- Audience and purpose = Identify or make reference to readers/document users, the purpose of

  a piece of communication, or both.

- Correctness = Guidelines, rules, expectations for correctness.

- Integrating graphics = Integrate tables, figures, or infographics into the textbook.

- Learning objective = A learning aim or expected outcome.

- Relevance of content = Instantiate a chapter or section focus; specify a genre for a deliverable;

  discuss what skills are required to produce a deliverable or complete an activity/assignment;

  mention helpful content; provide an example.

- Reviewing = Look back/go over textbook content; read material silently; read aloud while

  writing; read back text already produced.

- Teaching experience = Pedagogical approach; classroom experience.

When applied to the first transcript excerpt in this article, the codes point to a link between TWS's

developing chapter, technical writing concepts, and the author's teaching practices.

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[i] Salisbury (2005) produced think-aloud data during the naturalistic phase of her study. Although she did integrate an agreeability check into her research design when she asked colleagues to use the coding list she had devised to parse her data set, the coders were unable to fully comply with Salisbury's request due to time limitations and the extent of her data, as well as misunderstandings regarding coding requirements (pp. 164-165).

[ii] To exemplify how the data were coded for purposes transparency, codes have been inserted into the first transcript excerpt in this article. They are enclosed in parentheses so they can be distinguished from transcript content. Definitions of these codes can be found in the Appendix; a full list of coding definitions for the entire data

set is beyond the scope of this article given the substantial amount of data gathered, ongoing analytical work on the data set, and the additional areas of saliency that the data present.

iii The presence of double quotation marks in the transcript passage indicates that the writer is verbalizing textbook content as she is typing it or is reading aloud textbook material she has already produced.

iv Ellipses indicate that irrelevant content (e.g., filler language) has been omitted from the transcript excerpts when constructing this article.

v *Learning objective* is an example of a manifest-level code since TWS mentions the term in her TAP extract, while the code *correctness* can be understood at both manifest and latent levels since the author both uses the word "correct" and references it at the level of underlying meaning when she mentions "the rest of it that comes along with…the technical side" of illustration use.

vi *R* stands for researcher, TWD in this case.