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CONCEPTUAL FEATURE ARTICLE

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Developing instructional materials for English learners in the content areas: An illustration of traditional and contemporary materials in science education

Scott E. Grapin[1] | Alison Haas[2] | Lorena Llosa[2] | Okhee Lee[2]

[1]University of Miami
[2]New York University

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Research on TESOL materials development has focused primarily on instructional materials for contexts in which students are learning English separate from academic content (e.g., science, mathematics). This research could benefit from expansion given the increasing number of contexts in which students are learning content and English language simultaneously. In U.S. K–12 education specifically, a fast-growing population of English learners (ELs) is expected to achieve academically rigorous content standards that reflect new ways of thinking about content, language, and their integration. Thus, developing instructional materials based on the standards has necessitated shifts from traditional to contemporary approaches. The purpose of this article is to illustrate how instructional materials for ELs in the content areas have evolved over time. After describing conceptual shifts in the fields of content area education and language education that underpin the evolution of instructional materials, the researchers present traditional and contemporary elementary science units. Then, they analyze the units in relation to key features of traditional and contemporary materials for ELs in the content areas. Finally, they discuss how materials development in content learning contexts could expand

the scope of TESOL materials development by providing a fresh perspective on ongoing debates and tensions in this vibrant research area.

1 | INTRODUCTION

Although once dismissed as "something ... practitioners did" (Tomlinson, 2018, p. 1), TESOL materials development is now considered a "a practical act worthy of theoretical inquiry" (Bouckaert, 2017, p. 24). This research area has generated lively debates and tensions about topics such as the relative merits of commercially developed versus teacher-developed materials and whether materials should emphasize forms versus meaning (Tomlinson & Masuhara, 2018). However, despite this vitality, TESOL materials development has focused primarily on materials for contexts in which students are learning English separate from academic content (e.g., science, mathematics). This focus could benefit from expansion given the increasing number of contexts across the globe in which students are learning content and English language simultaneously.

One such context is U.S. K–12 education, where students classified as English learners (ELs) make up the fastest growing subset of the student population (National Center for Education Statistics, 2021). In this context, instructional materials must achieve the dual goals of promoting ELs' content and English language learning (National Academies of Sciences, Engineering, and Medicine [NASEM], 2017, 2018). The need for such materials has become even more urgent with the arrival of the latest content standards that are both academically rigorous and language intensive (Hakuta, Santos, & Fang, 2013; Lee, Quinn, & Valdés, 2013). As these standards reflect new ways of thinking about content, language, and their integration (Grapin, Llosa, Haas, & Lee, 2021; Kibler, Walqui, & Bunch, 2015; Walqui & Bunch, 2019), developing materials based on the standards has necessitated shifts from traditional to contemporary approaches.

The purpose of this article is to illustrate how instructional materials for ELs in the content areas have evolved over time. We begin by describing conceptual shifts in the fields of content area education and language education that underpin the evolution of instructional materials. Grounded in these conceptual shifts, we present traditional and contemporary elementary science units. Then, we analyze the units in relation to key features of traditional and contemporary materials for ELs in the content areas. Finally, we discuss how materials development in content learning contexts could provide a fresh perspective on ongoing debates and tensions in TESOL materials development. This article will be of interest to researchers and practitioners across content area education and language education, who share the responsibility for designing high-quality learning experiences for ELs in the content areas (NASEM, 2018; WIDA Consortium, 2020).

2 | CONCEPTUAL SHIFTS UNDERPINNING MATERIALS FOR ELS IN THE CONTENT AREAS

The fields of content area education and language education have undergone significant shifts in their conceptions of how content and language, respectively, are learned. These shifts are reflected in the transition to the latest content standards in U.S. K–12 education, including the Common Core State Standards for English language arts and mathematics (http://www.

corestandards.org); the College, Career, and Civic Framework for Social Studies (https://www.socialstudies.org/standards/c3); and the Next Generation Science Standards (NGSS; https://www.nextgenscience.org). The advent of the latest content standards has led to revisions of English language proficiency standards, such as the WIDA Standards Framework (WIDA Consortium, 2020), to ensure alignment with content standards (U.S. Department of Education, 2015) and to reflect the latest conceptions of language and language development (for an overview of key shifts in the WIDA standards, see Grapin & Lee, 2022). The ambitious learning goals of these content and English language proficiency standards, coupled with the increasing linguistic diversity of the K–12 student population, have been the driving force behind re-envisioning instructional materials for ELs in the content areas (see, e.g., a special issue by Campbell & Lee, 2021, devoted to materials development in science based on the latest standards).

In content area education, content learning was traditionally conceptualized in terms of individual learners' mastery of discrete facts and definitions isolated from any overarching purpose (for a critique, see Duschl, 2008). In contrast, contemporary content learning emphasizes engaging students with phenomena and problems that are compelling to figure out and that leverage students' knowledge and experiences (NASEM, 2018; Walqui & Bunch, 2019). To make sense of phenomena and problems, students engage in disciplinary practices (e.g., developing models in science, interrogating the sources of documents in social studies) that resemble the practices of professionals in these disciplines (e.g., scientists and historians; Ford & Forman, 2006). As students engage in disciplinary practices, they develop deep understanding of core ideas and concepts within and across disciplines (Harris, Krajcik, Pellegrino, & DeBarger, 2019; Mehta & Fine, 2019). While content learning may look different across contexts due to the different disciplinary norms of each content area and developmental expectations at each grade level (Lee, 2017), these conceptual shifts in content area education have taken place across content areas and K–12 grade levels (e.g., for disciplinary practices in language arts, mathematics, and science across K–12, see Council of Chief State School Officers, 2012).

In language education, language learning was traditionally conceptualized in terms of individual learners' mastery of discrete points of vocabulary and grammar (for a review, see Valdés, Kibler, & Walqui, 2014). In contrast, contemporary language learning emphasizes engaging students in meaningful and goal-directed interactions in communities of practice (Duff & Talmy, 2011; Larsen-Freeman, 2007; Zuengler & Miller, 2006). As students participate in interactions toward a shared purpose, they develop more specialized registers to carry out their community's collective work. For example, in the context of science, students develop specialized vocabulary (e.g., *erosion* to communicate about a science idea they figured out), sentence structures (e.g., *is similar to* to describe a pattern in data), and discourse organization (e.g., claim-evidence-reasoning organization to engage in argument). This specialized register, in combination with everyday registers, supports students to construct science disciplinary meaning (NASEM, 2018; WIDA Consortium, 2020). Importantly, specialized registers are not a prerequisite to participation in classroom communities but a product of participation (NASEM, 2018). Moreover, students construct disciplinary meaning not only through language but by deploying their full linguistic and semiotic repertoire, including nonlinguistic modalities (Canagarajah, 2018; Grapin, 2019) and translanguaging (García & Li, 2014).

These conceptual shifts in content area education and language education are mutually supportive (NASEM, 2018). For example, anchoring content learning in phenomena and problems provides a context for students to engage in goal-directed interactions. Disciplinary practices, such as developing models and arguing from evidence, involve deploying an array of linguistic and nonlinguistic meaning-making resources. Such mutually supportive shifts provide the conceptual underpinnings of changes in instructional materials for ELs in the content areas.

3 | ILLUSTRATION OF TRADITIONAL AND CONTEMPORARY MATERIALS USING ELEMENTARY SCIENCE INSTRUCTIONAL UNITS

Grounded in these conceptual shifts, we present two instructional units that reflect the evolution of a research program focused on developing materials for ELs in elementary science. The two units originate from two yearlong fifth-grade science curricula developed by the same core research team of science educators and applied linguists: Promoting Science among English Language Learners (P-SELL; 2004–2015) and Science And Integrated Language (SAIL; 2016–present). Both curricula address fifth-grade science standards and have been recognized as exemplary materials for ELs in science in their respective eras.

The P-SELL curriculum, based on the previous science standards (National Science Education Standards; National Research Council [NRC], 1996), showed positive impacts on students (Llosa et al., 2016) and teachers (Lee et al., 2016) in a large-scale randomized controlled trial. As a result, the curriculum was featured prominently in a consensus report on promoting the educational success of ELs (NASEM, 2017).

The SAIL curriculum, based on the latest science standards (Next Generation Science Standards Lead States, 2013; NRC, 2012), was the first yearlong NGSS-designed curriculum that focused specifically on ELs (Lee, Llosa, Grapin, Haas, & Goggins, 2019). The curriculum was awarded a Badge of Distinction by Achieve, Inc. (https://www.nextgenscience.org/resources/grade-5-sail-garbage-unit) and was featured prominently in a consensus report on ELs in STEM subjects (NASEM, 2018). Following the trajectory of P-SELL, SAIL is currently undergoing large-scale empirical testing.

By presenting instructional units from two curricula that have both been recognized as exemplars but responding to different sets of science standards in different eras of materials development, we illustrate how instructional materials for ELs in the content areas have evolved over time. For each unit, we highlight key moments in instruction that illustrate the unit's trajectory, which is consistent with recent attention to the unit level of materials development in content area education (e.g., Reiser, Novak, McGill, & Penuel, 2021). We recognize that these unit-level descriptions do not make visible many of the lesson-level strategies embedded within each unit that support ELs in the content areas (e.g., sentence frames, graphic organizers). However, while we acknowledge the importance of such strategies and have discussed them elsewhere on the pages of this journal (Grapin et al., 2021), the unit level has received relatively less attention than the lesson level in materials development for ELs in the content areas (Grapin, 2021). This lack of attention is problematic, since decisions made at the unit level provide the crucial foundation for lesson-level strategies to be effective. For example, if, at the unit level, materials are not anchored in phenomena or problems that leverage ELs' knowledge and experiences, lesson-level strategies may fall short of having their intended effect. As Walqui and Bunch (2019) argued, developing materials for ELs in the content areas requires “careful consideration of the larger curriculum ... beyond the implementation of discrete instructional ‘strategies’” (p. 3).

3.1 | Traditional unit: Promoting Science among English Language Learners (P-SELL)

P-SELL is aligned to the Florida (U.S.) state science standards, which, in turn, were based on the National Science Education Standards (NRC, 1996). We focus on one unit in the curriculum that addresses science standards related to the properties of matter (SC.5.P.8.1; SC.5.P.8.3) and changes in matter (SC.5.P.9.1). Figure 1 illustrates key moments in instruction over the 5-week unit, including selected excerpts from the science workbook provided to all students.

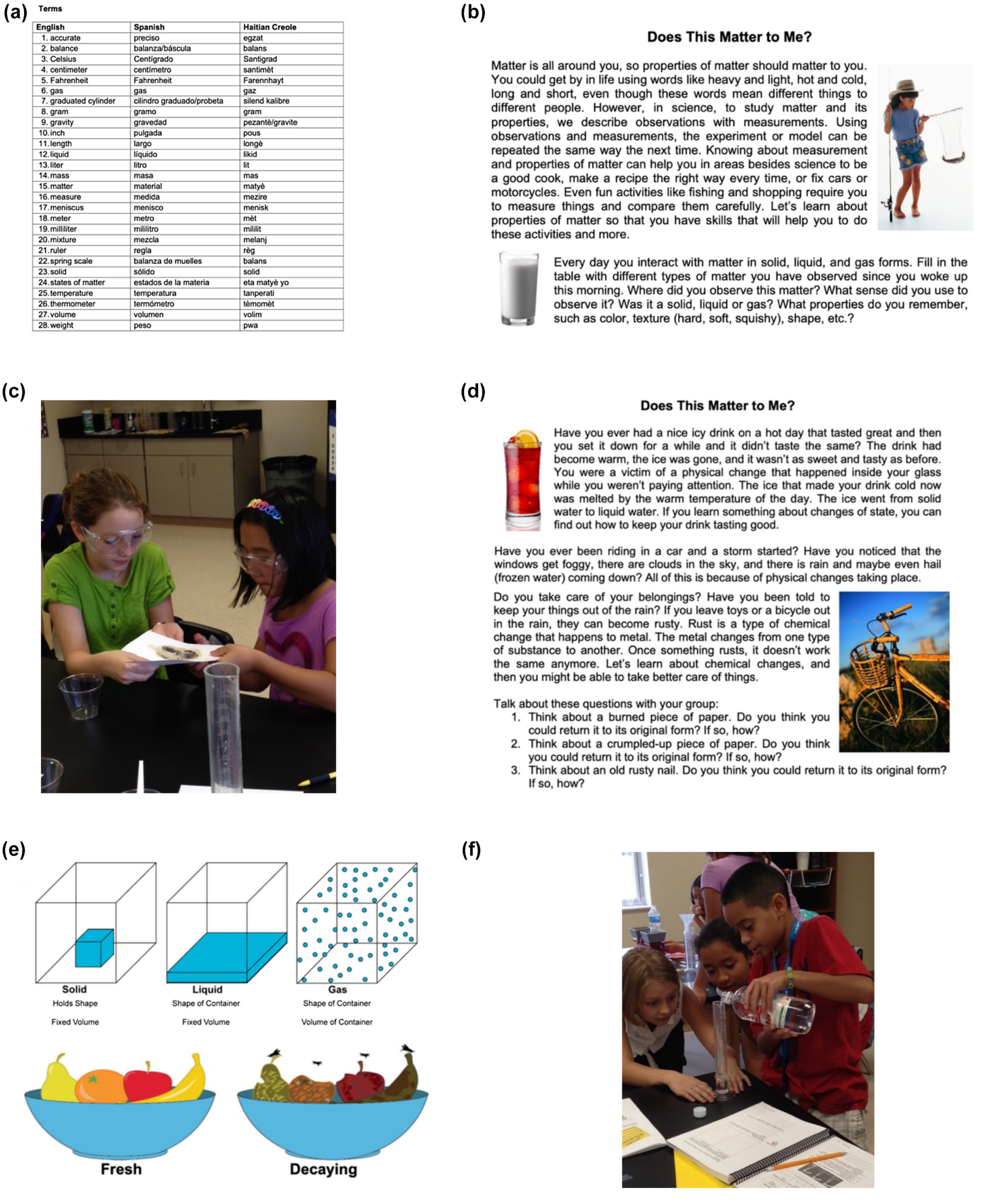
The workbook starts with a glossary of English vocabulary terms related to the standards and a translation of each term in the two most commonly spoken languages among ELs in the state of Florida, Spanish and Haitian Creole (Figure 1a). To begin the unit, students read a passage (Figure 1b) that introduces the science concept that matter can be observed based on its properties (e.g., color, texture, weight/mass). The passage describes how properties of matter can be observed in everyday activities, such as cooking, fishing, and shopping. The passage also introduces the three forms of matter: solid, liquid, and gas. After reading the passage, students practice recording data on the properties of different objects in their classroom, such as the length of their workbook and the weight of a beaker of water. Then, students carry out an inquiry activity in which they use properties (e.g., color, shape, magnetism) to separate a mixture of salt, sand, and iron filings (Figure 1c). The inquiry activity includes seven steps—questioning, planning, implementing, concluding, reporting, inquiry extension, and application—that appear consistently throughout the P-SELL curriculum.

In the next part of the unit, students read a passage from the workbook that introduces another science concept: physical and chemical changes (Figure 1d). To illustrate the different types of changes, the passage presents two familiar examples: ice melting in a drink (i.e., a physical change) and a bicycle rusting in the rain (i.e., a chemical change). The workbook also provides images to accompany the readings, including a representation of the three forms of matter (top of Figure 1e) and an image of a bowl of fruit decaying (bottom of Figure 1e). Then, students carry out another inquiry activity (Figure 1f), following the seven-step process described above, in which they observe the chemical change that occurs when vinegar and baking soda are combined (i.e., a gaseous substance is produced). At the conclusion of the unit, students apply what they learned to classify everyday scenarios (e.g., ice cream melting, food spoiling, wood burning) as either physical or chemical changes.

3.2 | Contemporary unit: Science And Integrated Language (SAIL)

SAIL is aligned to the latest science standards (NGSS), which have been adopted or adapted by 47 U.S. states and the District of Columbia. We focus on the first unit in the SAIL curriculum, which addresses science standards (called "performance expectations" in the NGSS) related to the structure and properties of matter (5-PS1-1; 5-PS1-1; 5-PS1-3; 5-PS1-4) and decomposers in the environment (5-LS2-1). By presenting a contemporary unit that addresses similar grade-level science standards as the traditional unit described above, we aim to accentuate the contrasts between traditional and contemporary materials for ELs in the content areas. Figure 2 illustrates key moments in instruction over the 9-week unit.

To begin the unit, students enter the classroom to find piles of their lunch garbage (that have been carefully curated to avoid any unsafe objects) from the school cafeteria (Figure 2a). Students work in small groups to sort the garbage materials into different categories (e.g., food, such as



English	Spanish	Haitian Creole
1. accurate	preciso	egzat
2. balance	balanza/báscula	balans
3. Celsius	Centígrado	Santigrad
4. centimeter	centímetro	santimèt
5. Fahrenheit	Fahrenheit	Farennhayt
6. gas	gas	gaz
7. graduated cylinder	cilindro graduado/probeta	silend kalibre
8. gram	gramo	gram
9. gravity	gravedad	pezantè/gravite
10. inch	pulgada	pous
11. length	largo	longè
12. liquid	líquido	likid
13. liter	litro	lit
14. mass	masa	mas
15. matter	material	matyè
16. measure	medida	mezire
17. meniscus	menisco	menisk
18. meter	metro	mèt
19. milliliter	mililitro	mililit
20. mixture	mezcla	melanj
21. ruler	regla	règ
22. spring scale	balanza de muelles	balans
23. solid	sólido	solid
24. states of matter	estados de la materia	eta matyè yo
25. temperature	temperatura	tanperati
26. thermometer	termómetro	tèmomèt
27. volume	volumen	volim
28. weight	peso	pwa

FIGURE 1 P-SELL Instructional Unit (Traditional Materials).

solid food and liquid; nonfood, such as plastic and metal). After sorting, groups share their categories with the class, and the teacher describes how students have sorted materials based on different properties. Then, students analyze the properties of materials in their home garbage, develop models of how garbage travels through their local garbage system, and take a virtual field trip to their community landfill. These experiences generate questions about garbage that students are interested in investigating (see students' questions on sticky notes in Figure 2b), which

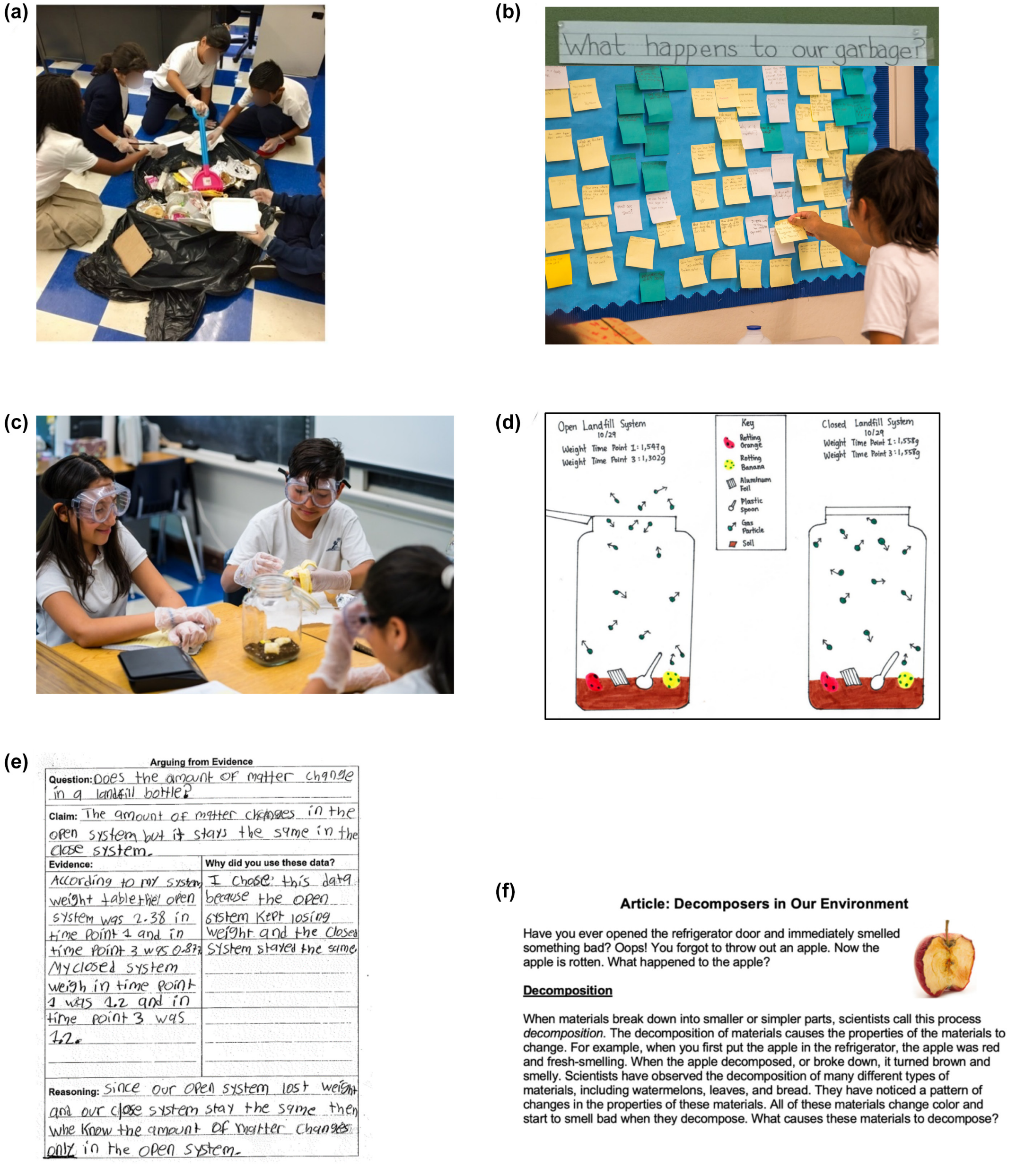


FIGURE 2 SAIL Instructional Unit (Contemporary Materials).

leads to one overarching driving question that the class will answer over the course of the unit: "What happens to our garbage?"

To begin answering the driving question, students plan and carry out an investigation in which they observe the properties of food and nonfood materials in landfill bottles (Figure 2c). Each group leaves one landfill bottle open and the other closed to observe any differences. As students observe changes in the properties of the food materials over time (e.g., banana changes from yellow to brown), students start to notice an unpleasant smell emanating from the open bottles, which makes them wonder, "What is that smell?" This question leads to a series of investigations (e.g., compressing air in a syringe, weighing a balloon before and after it is inflated), which provides evidence that smell is matter made of gas particles too small to see. Students then develop diagrammatic models (i.e., models on paper) to represent what they observe happening in their landfill bottles (Figure 2d). Based on the data they collected from their investigations, students also write an argument about whether the amount of matter changed in their landfill bottles (Figure 2e). They argue that the amount of matter decreased in the open landfill bottle because matter left the open system in the form of gas particles.

At this point, students begin to wonder what might have caused changes to the food materials in the landfill bottles. To answer their question, students plan and carry out an investigation in which they swab rotting food materials from the landfill bottles and observe them on an agar plate. When something begins to grow on the agar plate, students obtain information from a reading (Figure 2f), which they combine with data from their investigations to conclude that microbes (i.e., a type of decomposer) caused decomposition in the landfill bottles. At the end of the unit, students revise their diagrammatic models to explain how microbes decompose solid food materials and produce gas particles. The artifacts that students developed throughout the unit, including diagrammatic models and written arguments, help students answer the driving question of the unit: "What happens to our garbage?"

4 | ANALYSIS OF INSTRUCTIONAL UNITS IN RELATION TO KEY FEATURES OF TRADITIONAL AND CONTEMPORARY INSTRUCTIONAL MATERIALS

Table 1 presents key features of traditional and contemporary materials (for additional features, see Buxton & Lee, in press). Grounded in the conceptual shifts described earlier, the features in Table 1 address multiple aspects of materials for ELs in the content areas, including the organization of instruction (first row), the disciplinary focus (second row), the use of modalities (third row), and the use of registers (fourth row). In this section, we analyze the instructional units from P-SELL (representing traditional materials) and SAIL (representing contemporary materials) in relation to these features. To close the section, we describe how the key features of contemporary materials are instantiated in materials beyond elementary science.

First, in the traditional unit, instruction is organized around science concepts. ELs' knowledge related to these concepts is elicited as a hook at the beginning of instruction (e.g., students read about familiar examples of physical and chemical changes) and as an application at the end of instruction (e.g., students apply the science concept to everyday scenarios). In contrast, in the contemporary unit, instruction is organized around a phenomenon that students make sense of (i.e., people make lots of garbage in school and at home) and a driving question they answer (i.e., "What happens to our garbage?"). Because the phenomenon and driving question are contextualized locally, all students, including ELs, can leverage their home and community funds of knowledge as resources for learning science (Moll, Amanti, Neff, & González, 1992). Rather than being a hook or application, the phenomenon and driving question are sustained coherently throughout the unit, with each finding leading to the next question to investigate (e.g., the smell from the landfill bottles prompts students to investigate the nature of smell). This sustained focus on a phenomenon enables ELs to build their science understanding more comprehensively over time along with the language to communicate that understanding more precisely (e.g., ELs

TABLE 1 Key features of traditional versus contemporary instructional materials for ELs in the content areas

Feature	Traditional materials	Contemporary materials
Organization of instruction	Instruction is organized around content concepts. English learners' (ELs') knowledge and experiences are elicited as a hook at the beginning and/or as an application at the end of instruction.	Instruction is organized around phenomena, problems, and/or questions that are sustained coherently over time and that leverage ELs' knowledge and experiences.
Disciplinary focus	ELs learn content by reading and then engaging in tasks/activities to demonstrate what they read (e.g., inquiry activities).	ELs engage in disciplinary practices (e.g., arguing, explaining, modeling) to develop their own understanding of content.
Use of modalities	Nonlinguistic modalities (e.g., visuals) are used to illustrate content and scaffold comprehension, especially for beginner ELs.	All ELs, regardless of English proficiency, use multiple modalities (e.g., images, gestures) to communicate their ideas. Nonlinguistic modalities are essential for constructing disciplinary meaning.
Use of registers	The specialized register (e.g., discipline-specific vocabulary) is pretaught at the beginning of instruction.	ELs use multiple linguistic resources from the beginning of instruction. The specialized register is introduced in context when useful for amplifying meaning-making.

learn the specialized vocabulary term *particles* to name "those tiny things too small to see" that emerged as important for explaining the phenomenon; Grapin, 2021).

Second, in the traditional unit, ELs learn science primarily by reading about science concepts and then engaging in inquiry activities to confirm the concepts. For example, students read about chemical changes (e.g., bicycle rusting) and then carry out a seven-step inquiry process to demonstrate a chemical change (i.e., combining baking soda and vinegar). In contrast, in the contemporary unit, students engage in science practices to make sense of the phenomenon and develop their own understanding of science ideas. For example, students engage in science practices as they analyze and interpret data about the properties of garbage materials, develop models to represent what is happening in their landfill bottles, and argue from evidence about whether the amount of matter in their landfill bottles changed. As ELs draw flexibly on these science practices to answer their own questions, they have a reason to interact with others in their classroom community toward a shared purpose (i.e., to make sense of the phenomenon). While the contemporary unit, like the traditional unit, also involves reading, the purpose of the reading is different: Rather than introducing or teaching science concepts, reading provides another source of information that students use, in combination with other sources (e.g., models, arguments), to make sense of the phenomenon.

Third, in the traditional unit, nonlinguistic modalities (e.g., images, charts, tables, graphs) are used primarily to illustrate science concepts and scaffold ELs' reading comprehension. For example, readings throughout the unit are accompanied by images depicting the targeted science concepts (e.g., bowl of fruit before and after it decays to illustrate a chemical change). However, while ELs use nonlinguistic modalities in receptive communication, they are expected to express their understanding of science concepts primarily through written language, which preserves language as the privileged modality of communication (Kress, 2000). In contrast, in the contemporary unit, ELs deploy multiple modalities for expressive as well as receptive communication. For example, they develop and iteratively revise diagrammatic models using drawings, symbols, and language to represent their thinking about what is happening to food materials in the landfill bottles (e.g., dots and arrows to represent gas particles moving freely out of the open bottle). In other words, rather than primarily receiving canonical science knowledge constructed by experts, ELs develop multimodal representations to construct their own disciplinary meaning. This shift from multimodality as a scaffold for comprehending language to multimodality as essential for constructing disciplinary meaning positions ELs' meaning-making resources as valuable for learning science (Grapin, 2019).

Finally, in the traditional unit, the specialized register is introduced at the beginning of instruction. The unit opens with a glossary of vocabulary terms related to the science concepts. Through readings, students are introduced to each term (e.g., reading about *properties* in everyday activities) and then practice using the terms in subsequent activities (e.g., recording properties of different objects in their classroom). In contrast, in the contemporary unit, instruction happens largely in the reverse: Students begin by categorizing materials from their lunch garbage. As they collaborate with their peers, ELs deploy their full repertoire of linguistic and semiotic resources, including everyday registers (e.g., "That one goes there" while pointing to a garbage material) and translanguaging (e.g., "Ése mejor cabe right here"). Then, when groups report their categories to the class, the teacher builds on students' language to introduce the specialized term *properties*, thus amplifying ELs' meaning-making of the phenomenon. Other specialized terms (e.g., *matter, particles*) and sentence structures (e.g., "matter *is made of* particles") are introduced after students have experienced and begun developing understanding of the underlying science ideas. Furthermore, the discourse organization of a science argument (consisting of claim, evidence, and reasoning) is introduced when it is useful for ELs to construct evidence-based claims about the data they collected from their investigations. In this way, the specialized register is treated as a product of doing science rather than a precursor or prerequisite (NASEM, 2018).

While we have used elementary science as an example, the features in the right column of Table 1 are evident in contemporary materials across content areas and grade levels (see a recent volume on amplifying the curriculum for ELs by Walqui & Bunch, 2019). For example, in a middle school language arts unit (Walqui, Koelsch, & Schmida, 2012), students explore the theme of persuasion across time and space by engaging in language arts disciplinary practices (e.g., using textual evidence). As ELs analyze the use of persuasion in their everyday lives (e.g., television advertisements) and canonical texts (e.g., Gettysburg Address), they develop a more specialized register for analyzing the texts (e.g., *ethos* and *pathos*; discourse organization of a language arts argument) and then construct their own persuasive texts using multiple modalities (e.g., images, sounds, language). Similarly, in a high school world history unit (Catechis & Castilleja, 2019), students explore the question of whether maps are accurate representations of the world by engaging in social studies disciplinary practices (e.g., contextualizing, sourcing, corroborating). As ELs analyze historical maps from different sources and eras, they develop a more specialized register for analyzing the maps (e.g., *cartographer*, sentence structures to make a comparison) and then construct their own representations of the world using multiple modalities (e.g., drawings, symbols, language). Thus, the features in Table 1 represent a shared vision of contemporary materials for ELs in the content areas while also providing the foundation for future efforts to articulate, with greater specificity and granularity, the features of contemporary materials in different content areas and at different grade levels.

5 | IMPLICATIONS AND CONCLUSION

As contemporary materials for ELs in the content areas are beginning to emerge (Campbell & Lee, 2021; Walqui & Bunch, 2019), the features in Table 1 could guide the development of materials that reflect conceptual shifts from traditional approaches. In addition to being a resource for materials developers, the features could guide other stakeholders, including researchers and practitioners, to evaluate existing materials in relation to traditional and contemporary approaches. These features could be revised and refined as materials are tested in diverse contexts and as perspectives on content and language learning continue to evolve.

More broadly, materials development in content learning contexts could offer a fresh perspective on tensions in TESOL materials development, which has focused primarily on materials for language learning contexts. As Tomlinson and Masuhara (2018) describe in their comprehensive review of this literature, "ever since materials development for language teaching started to be written about, there have been a number of issues that have been hotly debated [and] none of them has really been resolved" (p. 2). In this section, we describe two tensions in TESOL materials development and how they might be illuminated by contemporary materials for ELs in the content areas: (a) commercially developed versus teacher-developed materials and (b) forms-focused versus meaning-focused instruction.

One tension in TESOL materials development is the relative merits of commercially developed versus teacher-developed materials. Whereas commercially developed materials (e.g., published textbooks and coursebooks) can be implemented across multiple contexts, teacher-developed materials are more likely to achieve "local relevance, personalization, and engagement" (Tomlinson & Masuhara, 2018, p. 28). Contemporary materials for ELs in the content areas illuminate the tension between commercially developed and teacher-developed materials in two respects.

First, contemporary materials, such as SAIL, are anchored in phenomena and problems that are experienced widely by learners, thus enabling use of the materials across multiple contexts, while also allowing teachers to contextualize these phenomena and problems locally (see first row in Table 1). For example, garbage is a widely relevant phenomenon that each teacher can contextualize within learners' local contexts (e.g., "What happens to our garbage?"). This widely relevant, locally contextualized approach (Haas et al., 2021) capitalizes on the affordances of both commercially developed and teacher-developed materials and begins to answer Tomlinson and Masuhara's (2018) call for materials that "offer variability and flexibility of use in order to help teachers and students localize ... the materials for themselves" (p. 27).

Second, contemporary materials, such as SAIL, are being developed through close collaboration between researchers and teachers (Haas et al., 2021). In contrast to a top-down approach of developing *for* teachers, this approach involves developing *with* teachers, who are "co-participants in the design" (Barab & Squire, 2004, p. 3). By leveraging the complementary expertise of researchers and teachers, materials development in content learning contexts has realized the ambitious goal of engaging K–12 students in disciplinary practices that resemble the practices of professionals (see second row in Table 1). In a similar manner, TESOL materials development could resist the binary between commercially developed and teacher-developed materials by leveraging the complementary expertise of TESOL researchers and teachers as they co-design materials that are both conceptually grounded in contemporary understandings of language and practically feasible to implement in diverse classroom contexts (Bouckaert, 2019).

Another tension in TESOL materials development is whether materials should promote forms-focused versus meaning-focused instruction. Whereas forms-focused instruction teaches learners discrete language forms (e.g., lexical and grammatical forms prescribed in a syllabus), meaning-focused instruction engages learners in "language in use" (Tomlinson & Masuhara, 2018, p. 35). Contemporary materials for ELs in the content areas illuminate the tension between forms-focused and meaning-focused instruction in two respects.

First, contemporary materials that foreground nonlinguistic modalities in disciplinary meaning-making remind us that communication is multimodal (see bottom row in Table 1). By exposing the limitations of treating linguistic aspects of communication as primary—a long-standing legacy in language education (see Grapin, 2019 for a critique)—materials development in content learning contexts urges TESOL materials developers to (re)consider the role of nonlinguistic modalities in key areas of language learning, such as pragmatics (e.g., Grabowski, 2009) and digitally mediated communication (e.g., Kessler, 2020). This is consistent with Tomlinson and Masuhara's (2018) call for integrating nonlinguistic modalities into language teaching materials in ways that go beyond "decorations for the eyes" (p. 27).

Second, contemporary materials for ELs in the content areas remind us of the primacy of meaning in language use (see third row in Table 1). In content learning contexts, it makes little sense to introduce the specialized register (e.g., *particles*) before or separate from the content ideas this register is intended to communicate (e.g., what a particle is and why it is relevant to making sense of the phenomenon). Likewise, even in contexts where language learning is the primary goal, it may make little sense to focus on lexical and grammatical forms before or separate from the meanings those forms are intended to communicate. In language learning contexts, materials can instigate opportunities for goal-directed language use that make target forms meaningful.

Traditionally, the fields of language education and content area education have evolved separately (NASEM, 2018), and the TESOL materials development literature is no exception to this tradition. However, the separation between these fields is best understood as an abstraction that, while at times useful, can distract from the reality that content learning and language learning are two sides of the same coin. Indeed, there is no language that is content-free (i.e., learners need something to listen, read, speak, and/or write about), and there is no content that is not mediated, at least in part, through language (i.e., learners need ways of making sense of and communicating about the content they are learning). Ultimately, despite differences in their foci and relative emphases, materials focused on language learning and materials focused on content learning share a commitment to a common goal: to help learners construct new meanings. By expanding the scope of TESOL materials development to address materials development for ELs in the content areas, this article seeks to initiate a dialogue between historically separate fields around their shared commitment to amplifying learners' meaning-making potential and opening up new worlds of language and of ideas.

THE AUTHORS

Scott E. Grapin is an assistant professor of language, literacy, and learning in the School of Education and Human Development at the University of Miami. His research focuses on the teaching and assessment of multilingual learners in K–12 settings, particularly in their content area classes.

Alison Haas is the director of development and implementation for multiple grants at New York University. Her research addresses curriculum development, teacher professional learning, and educational technology.

Lorena Llosa is a professor in the Steinhardt School of Culture, Education, and Human Development at New York University. Her research addresses the instruction and assessment of multilingual learners in K–16 contexts, with a focus on content and language integration, formative classroom assessment, and assessment validation.

Okhee Lee is a professor in the Steinhardt School of Culture, Education, and Human Development at New York University. Her research involves integrating science, language, and computational thinking with multilingual learners.

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