

Disciplinary registers in a first-year program

A view from the context of curriculum

Alfredo A. Ferreira & Sandra Zappa-Hollman

University of British Columbia

With notable exceptions, few studies of teaching and learning of scholarly registers and genres to users of English as an additional language focus on curriculum. For a contextualized understanding of register-curriculum relations, this study investigates disciplinary registers in the Academic English Program at Vantage College, a new alternative-entry, first-year program at the University of British Columbia, Canada. In integrating content and language instruction, the curriculum adopts systemic functional linguistics as the informing theory of language. Program registers and their relations are investigated using Matthiessen's (2015) context-based register typology. This novel case study highlights register-curriculum relations in key aspects, including discipline-specific variation in register instruction, planned learning trajectories, faculty collaborations, and relations between English for general and specific academic purposes.

Keywords: English for academic purposes, register, academic literacy, undergraduate studies, international students, curriculum, content and language integrated learning, systemic functional linguistics, second-language writing

1. Introduction

Research on the teaching and learning of scholarly registers and genres to users of English as an additional language calls for contextualized frameworks (e.g. Hyland 2004; Nesi & Gardner 2012; Ravelli & Ellis 2004; Schleppegrell 2004a; Swales 1990, 2004). However, relatively few studies focus on scholarly registers specifically from the perspective of curriculum, a few exceptions being Byrnes, Maxim & Norris (2010), Dreyfus, Humphrey, Mahboob & Martin (2016), Miller & Pessoa (2016, 2017) and Rose (2014). The present paper contributes to this body

of research and the field of English for academic purposes (EAP) more generally by investigating disciplinary registers employed in an innovative, credit-bearing academic language and literacy program for first-year international students using English as an additional language, the Academic English Program (AEP) at Vantage College (VC) in the University of British Columbia (UBC), Canada. The AEP curriculum is integrated in a first year bachelor degree program at VC, a recently created academic unit in UBC that offers enriched, sheltered instruction in four general streams: science, applied science, management and arts. The AEP has adopted systemic functional linguistics (SFL) as the informing theory of language, using register as a central concept in the curriculum.

In the AEP at VC, the selection of registers formally included in the foundational writing courses and across course syllabi has been undertaken with the ongoing development of the large, multidisciplinary curriculum. These circumstances of theory-based, syllabus-led curriculum development present an opportunity to reflect on the selection and use of registers to this point (early 2018) in the history of this young program. The opportunity to reflect can be pursued in various directions. Here we attempt an inventory of the registers formally taught and assessed in the program, investigate the relations between them in the curriculum, and detail register-context relations for several key registers. While this case study draws attention to the institutional context of a large research university and English as the target language, we hope that it contributes to the understanding of register-curriculum relations across institutional contexts and target languages.

To account for registers in the AEP context, we adopt the context-based register typology developed by Matthiessen (2006, 2009, 2015; Teruya 2007). The register typology uniquely encompasses practices across the speech-writing continuum, offering an opportunity to map meaning-making practices across the AEP, from formally instructed and assessed registers to informal registers where much academic socialization also occurs (e.g. Duff 2010). In this paper, the account of the relationship between register and curriculum focuses on instructed registers with particular attention to the articulation between foundational academic registers instructed in a writing course and the more specialized, disciplinary registers instructed in adjunct English for specific academic purposes courses (ESAP). The instructed registers are differentiated and illustrated in this paper at various degrees of delicacy, from the schematic presentation in a preliminary map of the AEP's instructed registers to a closer investigation of three registers that are central in the respective VC streams and AEP courses in which they are taught. The aim is to understand register-curriculum relations across levels of delicacy through a case study of a large, credit-bearing English for academic purposes

(EAP) program integrated in first-year bachelor degree programs across multiple disciplines.

The VC AEP adopts SFL as informing theory for explicit, task-based teaching and learning. The descriptions of disciplinary registers that are taught emerge from various sources. These include the descriptive literature on the registers and genres of school and university (e.g. Biber 2006; Halliday & Martin 1993; Hyland 2004; Martin & Rose 2008; Schleppegrell 2004a; Swales & Feak 2004), descriptions of focal features of locally relevant registers, descriptions directly recontextualized into instructional materials, and discussions between AEP and content-area instructors. The eclectic approach to describing and teaching disciplinary discourses is importantly guided by the SFL concept of register, with its central principle of the co-realization of meaning in context through lexicogrammatical and semantic choices. Emerging research on the VC program points to its general success as an academic literacy initiative and to the role of the SFL concept of register in achieving these results. Despite this and the relatively well-resourced nature of the program (e.g. lead time before program launch, collaboration between language and content specialists structured into the curriculum, hiring of a curriculum manager, an SFL specialist, and materials designers as the courses were being set up), we lack a broad and cohesive understanding of the disciplinary registers in play across the multidisciplinary program.

Since the AEP in question is SFL-informed, the descriptions and teaching of register are led by the general orientation across the curriculum to language as a resource for making meaning in context (Halliday & Matthiessen 2014). Our experiences as instructor (Ferreira), curriculum developers (Ferreira, Zappa-Hollman) and administrator (Zappa-Hollman) inform us that the program-specific descriptions of disciplinary registers are developed most extensively in and through instructional materials, rather than, for example, a multi-phase sequence involving analysis and description of disciplinary registers that are subsequently recontextualized in teaching. In this setting, then, disciplinary registers are generally not taught from stable, decontextualized descriptions that are subsequently applied in instruction. Rather, register is better understood here as a concept guiding the selection of features of science, applied science, social science and humanities discourses for pedagogical focus. As such, the concept of register facilitates diverse yet integrated perspectives on meaning making in academic contexts from the particular to the very general, across the curriculum. The dynamic institutional context of SFL – and register-informed instruction make the investigation of the relationship between registers, their use and the curriculum especially relevant.

This introduction is followed by a definition of the concept of register and its framing in Matthiessen's (2015) register typology, an overview of the institutional setting, which is different from most academic English programs, and, at

the core of the paper, the preliminary mapping of disciplinary registers in the program. This mapping is followed by contextualized accounts of three salient registers taught in the program that highlight more specifically relations between the nature of register instruction and the curriculum. The paper closes with a discussion of these relations and the implications of these findings for the program and the field.

2. Register: definition and rationale

The VC AEP curriculum draws on the SFL notion of choice in conceptualizing meaning making in context. Linguistic meaning is made by social subjects who select (consciously or otherwise) from available linguistic resources. As the relationship between these aspects of language is one of realization, the meaning of the subject's choice may be considered from the view of any of them. Registers are realized semantically as configurations of particular values selected from the contextual variables of field (what is going on, realized lexicogrammatically in choices of ideation), tenor (who is involved, realized lexicogrammatically in interpersonal choices), and mode (the semiotic channels involved, realized in textual choices) (Halliday 1978; Halliday & Matthiessen 2014; Lukin et al 2008; Matthiessen 2009, 2015). As configurations of meanings, registers are located at "an 'interface' between context and lexicogrammar", which

language learners learn as a *strategic* resource... for construing their experience of the world as meaning and enacting social roles and relations as meaning; and this will provide them with the 'bridge' to the lexicogrammar".

(Matthiessen 2006: 37; emphasis original)

Highlighting the perspective "from above", Matthiessen defines registers as

functional varieties of language that have evolved as adaptations to different institutional settings – different uses of language according to the nature of the context of use; they are the subsystems of language that operate in these contexts; 2009: 207).

This view of register as an institutional variation of language use is especially relevant given our interest in curriculum.

Another feature of the concept of register that is highly relevant to the discussion is its scalability. As institutionally-situated variations of language, registers are identified within the cline of instantiation between a text as an instance of language use and language as a system of meaning potential (Halliday &

Matthiessen 2014). Accordingly, register can be interpreted at various degrees of delicacy.

Because the cline [of instantiation] is a continuum, we find intermediate patterns of meaning between the two poles. These can be modeled as subsystemic patterns that operate under certain contextual conditions: registers operating in institutional settings, or they can be explored as instance types that emerge over time; text types operating in situation types. (Matthiessen 2009: 207)

Accordingly, register is scalable within the cline of instantiation: more instantial as text-type, more systemic as register (see e.g. Figure 2 in Matthiessen 2015: 4). The concept of register is further articulated by Matthiessen (2015) in categories of hybrid, overlapping, nuclear and macro-registers (see also Matthiessen & Teruya 2015), categories which are useful in understanding registers in the VC curriculum.

Register-informed instruction typically asks learners to exploit the dialectic of language system and textual instance by noticing the semantic and contextual implications of patterns in texts. As learners progress, the insights they gain into text-context relations are applied with increasing facility and delicacy in new situations (Matthiessen 2006: 34).

The scalability of the concept of register in instructional practice appears to enhance its utility for teachers. In our context, at least, instructors regularly generalize textual phenomena to variable scales of discursive practice, from the more instantial aspect for fine-grained understanding of a disciplinary subfield, to practices viewed more systemically across fields more broadly defined such as science and applied science, and across academia even more generally. For example, a text feature such as extended post-modification of nominal groups may be very moderately generalized in one phase of an EAP course just to the approach taken in a particular disciplinary text (e.g. how post-modification is used to help track an entity in a chemistry lab report). In another phase of instruction, the same text feature may be used to illustrate a general feature of scholarly discourse such as the broad functionality of highly specific entities (Halliday & Martin 1993; Halliday 1998; McCabe & Gallagher 2008; Schleppegrell 2004a; Wignell 2007).

Where the aim for engaging with the concept of register is language learning, register may be learned as a socially-motivated pattern of language choices that emerges in context of situation, i.e. language learning through register as literacy practice (Williams 2016). Register may also be approached as the linguistic realization of a situation type that is recognized and internalized by features of context, even those in which language is only ancillary to the social activity. Registers may also be instructed and learned through “linguistic magnification”, as metalinguistically-informed reflection on language and meaning (Williams 2016).

Efforts to understand the teaching and learning of disciplinary registers are rather infelicitously dichotomized in the names given to the expanding fields of Content-based Instruction (CBI) and Content and Language Integrated Learning (CLIL). This critique is made by Llinares, Morton, & Whittaker (2012), and more recently by Coffin, who points out that

CLIL by its very name suggests the desirability of a close relationship between learning language and learning content but at the same time, by separating out the terms through the use of and (i.e. content and language) it suggests that they are two distinct phenomena as opposed to two dimensions of a single process.

(2017:92)

Such dichotomous construals of “content and language” separate language from its functions and, furthermore, reduce those functions to one of representation (i.e. “content”). The persistence of these labels indicates the difficulty in the current academic milieu of conceptualizing language as an integrating, multifunctional resource for meaning-making in context.

As learners advance in their additional language, these three aspects of language learning – learning language, learning through language, and learning about language – increasingly overlap (Halliday 2004 [1980]; Matthiessen 2006). This insight helps to orient tertiary literacy programming to register as a guiding concept for the curriculum:

Learning a language increasingly becomes a matter of learning through this language in a growing range of quotidian and professional contexts (thus moving close to the condition of native speakers);¹ and learning a language can increasingly be helped by learning about this language – not only passively, but also actively by investigating it and by developing one’s own resources for learning [...] learning through language is intricately linked to the expansion of a learner’s registerial repertoire [...] and can be guided by a context-based typology of texts/registers.

(Matthiessen 2006:33)

In this case study, the analysis of curricular registers and their relations in learner progression is aided by the context-based register typology developed by Matthiessen (2006, 2009, 2015; see also Teruya 2007). Using existing descriptive studies in educational linguistics, Matthiessen (2015:38–42) demonstrates the explanatory potential of the typology for various purposes, including to map school subjects and programs, and to track learner trajectories in subject areas and writing development. However, to our knowledge, with the exception of

1. The notion of an idealized “native speaker” is rightfully contested; we note that the concept is not construed as an idealized speaker but rather as a quality of the context in which language is learned.

Matthiessen's (2006, 2009, 2015) references to the relevance of the typology for understanding specialized registers and their development, and the profiles of four disciplinary genres in Parodi (2010), the typology has not been applied in institutional case study or tertiary contexts.

The register typology, shown in Figure 1, identifies the eight primary registers of human language-mediated meaning-making, classified foundationally in field terms as social semiotic processes. In our use of the typology, we recognize that while social semiotic processes are crucial to the realization of different registers (especially in the academic context under investigation), differences in register cannot be reduced to these processes or to field. The registers are also differentiated in the typology by the other parameters of context (tenor and mode); however, for economy, we refer to register differences in field terms.

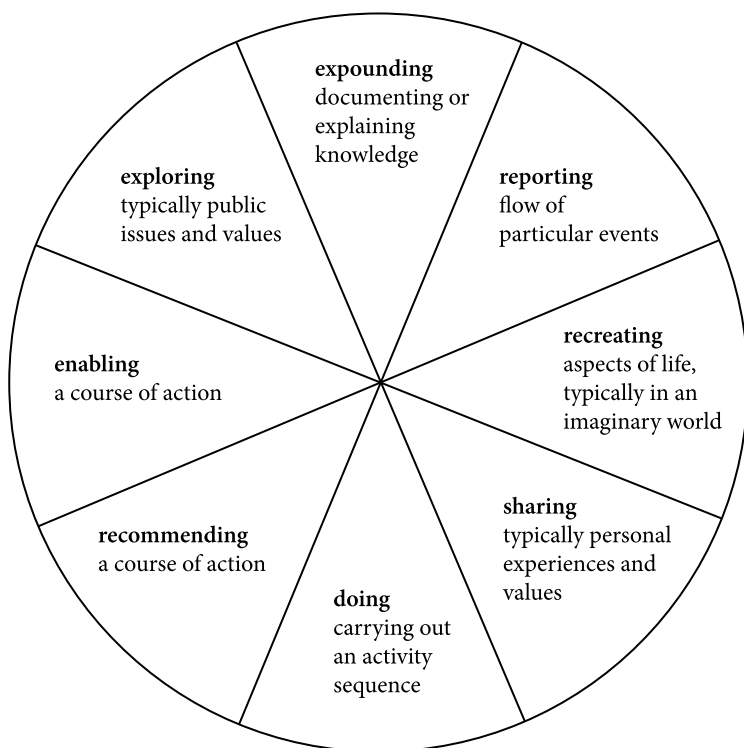


Figure 1. Register typology based on social semiotic processes (figure adapted from Matthiessen 2006)

Complementary to the foundation of the typology in field is the relationship construed between language and the *material situational setting* (Hasan 2005 [1973]), whereby registers are understood to vary to the extent that they either

constitute or are ancillary to the goings on in context. For example, written meanings in academic settings are typically mobile and correspondingly free of the immediate material context of the writer and reader, reflecting the constitutive functions of language in the situational setting. In contrast, the language exchanged among football players during a match, for example, is typically ancillary to the setting, in which material meanings have a larger functional load in the situational setting.

This scope of the register typology in relation to the situational setting stands to enhance the analysis of registers across academic and quotidian contexts, drawing into the analysis an appreciable range of cultural, institutional and ontological variation. For example, when seeking to understand academic literacy developmentally, including relations between orality and literacy, the typology can account for the continuity between everyday informal registers and the registers of schooling. (Bernstein 1990; Hasan 2005; Ortega 2015).

Accordingly, among the registers closer to the top of the typology figure, notably exploring, expounding, and reporting, language is typically constitutive of the social activity while towards the registers of doing, at the bottom, language is increasingly ancillary to the goings-on in context. The registers at the top of the figure are more likely to be associated with academic discourse communities and the knowledge-building functions of language.

The perspective afforded by the typology on the role of language in relation to the social activity at hand can clearly help guide a top-down, context-based analysis of registers; however, it also informs the lexicogrammatical, bottom-up perspective. For example, registers of expounding and exploring predict the heightened use of ideational grammatical metaphor in realizing the abstract, often decontextualized knowledge associated with scholarly writing (Halliday 1998).

As shown by Matthiessen (2015:40), the typology can be useful for gaining perspective on the development of disciplinary literacy. The typical trajectory in the subject area of history from late elementary to late high-school (Coffin 2006; Christie & Derewianka 2008) is tracked counter-clockwise on the typology, from recreating in story time through to chronicling among other reporting registers, and on to exploring in contexts of historiographical exposition and discussion.

The sub-headings for each register in Figure 1 primarily point to the field and mode values differentiating these patterns of meaning-making, that is, values associated with reflecting on and construing the world of knowledge and experience, and the textual enabling of the construals. Additionally, the typology reflects variation in tenor at various levels, including of course institutionally. For example, within the register of expounding, Matthiessen (2015:26) differentiates explaining and categorizing, illustrating these in a healthcare setting by comparing the respective text-types of a medical article for healthcare professionals and a

clinical lecture between a healthcare practitioner and a novice. In such ways, the typology helps differentiate registers on a spectrum between relatively unspecialized and specialized discourses, and the interpersonal relations enacted when these two meet.

As presented below, these insights offered by the typology are valuable when considering features of context such as the quality of collaboration between disciplinary and EAP instructors. In analyzing interpersonal relations, we have found that the register domains on the right side of the typology (such as sharing and reporting) generally enact consolidated tenor relations with relatively elevated functional loading on objective orientations, while those on the left (such as exploring and recommending), enact consolidating relations, in which subjective orientations and the sub-system of modulation (i.e. obligation and inclination) within the system of modality are more likely in play.

Matthiessen (2015) usefully guides our understanding of the register typology in relation to Martin and colleagues' genre typology (Martin & Rose 2008). This is especially helpful in contexts of EAP practice such as ours in which the concept of genre, and the associated Sydney School pedagogy (Martin & Rose 2005), are also used. As the genre typology is primarily associated with genres of schooling in which language is constitutive of the social activity (in some cases, along with images), not all of the registers in the register typology have corresponding genres. Those that do are as follows: explaining and categorizing in the expounding register are linked to explanation and report genres; chronicling is a reporting register linked to recounts, biographies, procedures and procedural recounts; narrating, within the more general register category of recreating, is linked to story and narrative genres; the register of sharing experiences and values is linked to story and anecdote genres; the enabling registers of instructing and regulating are linked to procedures and procedural recounts; and the exploring register of arguing is linked to exposition and discussion genres. In accordance with the aim of understanding relations between genres in texts (Martin & Rose 2008), registers may well be subordinate, embedded, and superordinate in relation to each other in texts.

The affordances of the concept of register outlined above aid our understanding of the nature of language and literacy teaching and learning across the VC EAP curriculum. In outlining the nature and use of specific registers in the curriculum, we are particularly interested in the ways the scope of register as a theoretical and pedagogical tool provides instructors and students with identifiable entry points, way markers, and destinations for learning. In preparation for the review of registers and their relationship to the curriculum, the next section details the setting, focusing on key features of the VC program.

3. The setting: a program for first-year international students at a Canadian university

As indicated in the introduction, the institutional context we are reporting on here is Vantage College, a recently established academic unit at the University of British Columbia in Vancouver, Canada. VC was created in 2014 to expand opportunities to pursue undergraduate studies for prospective students from across the globe who, while strong academically, would not have been accepted for direct entry at UBC due to not meeting the university's English language requirements. Successful VC applicants, then, share an academic profile as successful learners, and express a motivation to join the culturally and linguistically diverse UBC community.

As an independent unit not linked to any faculty, VC is led by a Principal who reports to the Provost's office, an Academic Director who oversees all curricular and instructional matters, an appointed Chair for each of the respective four streams (Vantage One Applied Science, Arts, Management, and Science), and a Director of Academic English Programming (Zappa-Hollman's role), who is responsible for matters related to English language teaching and learning across all stream options. Instructors in the various disciplinary streams are assigned teaching loads both in their home departments and to VC. While providing an institutional structure for coordinating content and language instruction, this arrangement also helps to ensure that the VC sections of content courses are equivalent (when not identical) to those sections in UBC's direct-entry programs. (For programming information, please consult the VC website: www.vantagecollege.ubc.ca).

Each stream option runs for eleven-months, thus extending the regular eight-month (two-term) standard schedule to three terms (locally referred to as T₁, T₂, and T₃). This extra time for students to complete their freshman year at UBC in VC allows us to offer enriched programming through the inclusion of embedded academic English courses, academic English tutoring and workshops, and an introductory course on research methods that situates students as apprentice scholars. This course culminates with the presentation of students' projects at a student-led, year-end Capstone Conference. Hence, rather than functioning as a traditional EAP unit that offers pre-sessional academic English preparation or "add on", typically non-transcriptable EAP courses, the Academic English Program (AEP) at VC is fully integrated into the student's academic experience. This integration is realized structurally through the allocation of credits to all academic English courses, theoretically by drawing on SFL, and pedagogically with a compatible task-based pedagogy involving language-content instruction.

A focus of VC's mandate is to serve as a laboratory for pedagogical innovation. Novel approaches undertaken *within* the VC program are trialed and potentially exported to other courses and programs at UBC and beyond. A fundamental innovation is in the VC institutional structure, described above, for close collaboration between faculty specializing in language and those in the (other) disciplinary streams. This arrangement, which required institutional coordination at the highest levels of the university, significantly facilitates AEP curriculum development by providing instructors with sustained access to content course materials as well as content instructors' perspectives on these materials. This innovative institutional structure and the relatively programmatic application of SFL in a task-based curriculum are mutually reinforcing in providing coordinated access to and understandings of target disciplinary practices; as such, these two innovations may be considered foundational in sustaining and differentiating the AEP at VC.

Another innovative aspect of the VC program is its coordinated curriculum, which in each stream includes a suite of strategically selected courses from a variety of disciplines in the respective faculties involved, alongside research-oriented courses (VANT 148 and VANT 149) and a language-oriented curriculum, our present focus.² Table 1 summarizes this information for the Science stream curriculum. The curricula of the other three streams share a similar structure and are based on the same premise of affording VC students an enriched educational experience where the focus is on students as knowledge producers rather than as repositories and consumers of established knowledge. For details on the curriculum structure in each stream, please refer to the college website: <https://vantagecollege.ubc.ca/program-overview>.

The language-oriented courses include LLED 200, a foundational course in writing academic and professional registers;³ LLED 201 (in the Science and Applied Sciences streams only), which is a second foundational academic literacy course that further develops students' knowledge and experience of research-based academic writing by providing opportunities to design, conduct, and report on a small research project;⁴ and VANT 140, an adjunct English for *specific*

2. VANT 148 and VANT 149 apprentice students into research practices through reading and discussing science research and conducting a small research project (see Lehki et al. 2017).

3. LLED refers to UBC's Language and Literacy Education Department. The LLED 200 course was first listed at a time when the department was headed by the educational linguist and systemicist Geoff Williams. Another prominent systemicist and professor emeritus of LLED is Bernie Mohan.

4. Recently, science students in LLED 201 have the option of expanding methods of SFL-informed discourse analysis learned in the foundational writing course (LLED 200) to research science writing in an area of interest. This has resulted in some precocious work, for example, a

academic purposes (ESAP) course linked to the respective disciplinary courses that aims to introduce students to discipline-specific discourses and practices.

Table 1. Vantage One science stream curriculum 2017–2018 (38–41 credits total)

Term 1	Term 2	Term 3
CHEM 121 (4 cr.) Structural Chemistry MATH 100 (3 cr.) Differential Calculus PHYS 117 (3 cr.) Physics LLED 200 (3) cr. * Academic Registers	CPSC 110 (4 cr.) Computer Sciences OR EOSC 110 (3) Earth & Ocean Sciences MATH 101 (3 cr.) Integral Calculus PHYS 119 (1 cr.) ** Experimental Physics Lab SCIE 113 (3 cr.) First-Year Science Seminar LLED 201 (3 cr.) * Designing and Writing Research	Two of: CHEM 123 (4 cr.) Physical and Organic Chemistry PHYS 118 (3 cr.) Physics CPSC 121 (4 cr.) Computer Science CPSC 103 (3 cr.) Computer Science
VANT 140 (4) * Integrated Language & Content Tutorials VANT 148 (2) Exploring Research Topics		VANT 149 (1) Multidisciplinary Research Project

* Does not count towards Faculty degree requirements
** take only if PHYS 118 is elective choice for summer
*** note: cannot take CPSC 110 OR CPSC 121 if taking CPSC 103

These courses are taught by the faculty members of the AEP team, all seasoned tertiary-level instructors, yet most with no previous background or teaching experience in SFL at the time of hiring. To support instructors’ professional development in this regard, the program offers workshops on foundational and emergent areas of interest, and an on-call “SFL help desk”. The team also meets weekly for curriculum planning, which offers an additional opportunity for further training on a systemic orientation to language teaching and learning. Other important opportunities for professional development of text- and language-based approaches to literacy teaching are the calibration sessions in which AEP instructors within a stream meet to calibrate the assessment of student work and exchange feedback practices according to SFL-based assignment rubrics.

As stated in the LLED course syllabus, the objective of LLED 200 is

to prepare undergraduate students in [Science and Applied Science; or Arts and Management] to write academically in English. Students will improve their academic writing by increasing their understanding of the language features and pur-

study of interpersonal positioning in organic chemistry papers written in Chinese and English and nominalization and concept formation in the history of plant intelligence research (Ferreira 2018).

poses of writing in the university. Students are taught to read and analyze their writing and that of experts, and carry out a range of short, practical writing tasks.

Thus, the course serves as the entry point to a systemic view of language through a focus on the three metafunctions (please refer to the next section for more details on how SFL informs this course). Figure 2 shows the variation in the organization of instruction in the metafunctions between the two versions of the course. The metafunctions shown in the figure are labelled according to the recontextualized names used across the program. While in both versions the dialectic between language and meaning in context is exploited recursively and a holistic perspective on register variation is introduced early, in the Science/Applied Science syllabus, individual metafunctions are in focus successively, for two to three weeks of instruction. In this structure, initially, a general written academic register is posited, often in contrast with typical choices in casual speech. Thus more fine-grained register variation is relatively subordinated to understanding and practicing options for generating academically-valued texts through lexicogrammatical options in ideation (experiential “content” and logical relations), interpersonal positioning, and textual organization.

On the other hand, in the structure of the Arts/Management syllabus, the metafunctions are regularly recycled as the syllabus progresses through types and features of registers. Beyond the foundational academic literacy goals of the course, the variation in the structure of the LLED 200 courses is also relevant to content specialization in the various streams, especially in terms of informing how disciplinary registers are mainly identified.

In the more discipline-specific VANT 140 courses, the key learning outcomes are for students

to be able to use strategies of self-directed learning to reflect on and revise their work; to identify the main organizational patterns of discipline-specific (written/oral) texts and be able to organize these for either a specialist or non-specialist audience; and to identify and employ strategies to pack and unpack information, concepts, and/or arguments from a variety of sources.

(VANT 140 course syllabus)

The course is taught for three hours a week per academic term (i.e. 13 weeks in T1 and T2). Two curricular models (see Figure 3) coexist at the moment: a modified traditional adjunct model (Brinton et al. 1989) that includes three separate but coordinated subcomponents of the course, each connected to a different disciplinary course (e.g. Chemistry, Computer Science, and Engineering Design in the Applied Science stream); and an “integrated” model – a modified adjunct course (Brinton & Snow 2017) – that focuses on specific registers guided by any one of the

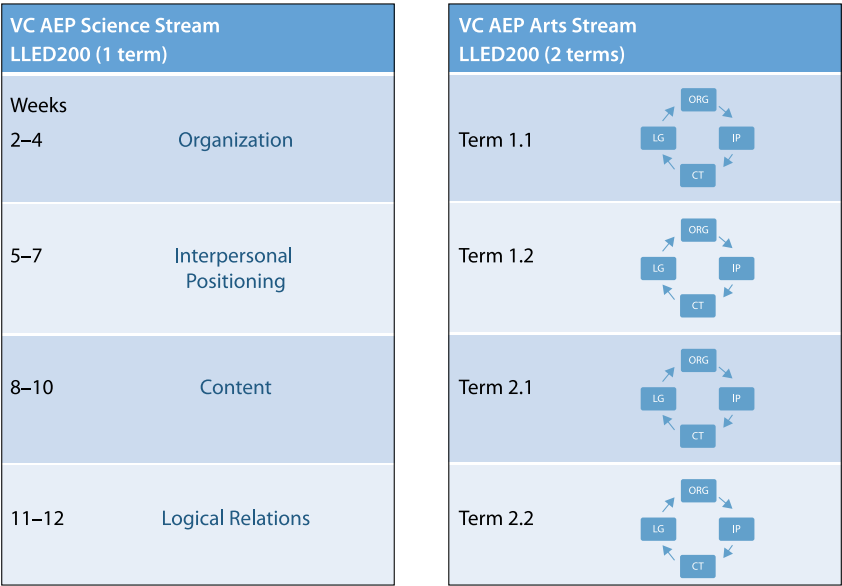


Figure 2. Variation in distribution of metafunctions in the two LLED 200 syllabi

disciplinary courses, oftentimes comparing the same register across disciplines, identifying common as well as unique aspects in how the registers are realized across the metafunctions. The first approach is in place in the Applied Science and Management streams, whereas the second (integrated) approach was recently adopted by the Arts and Science streams in response to student feedback and to changes in the overall stream curriculum (a point we further address in the discussion section).

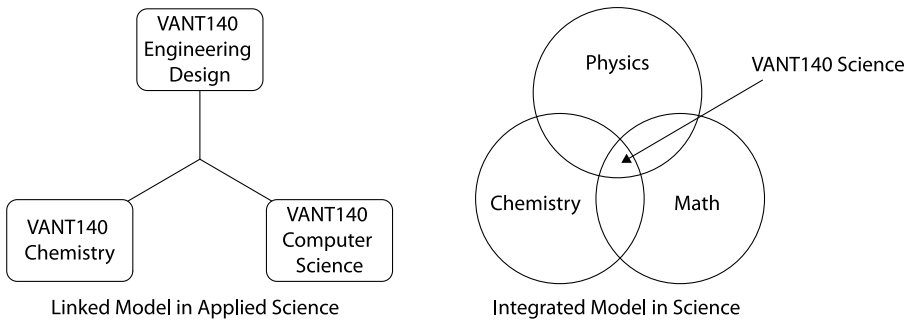


Figure 3. Two curricular models for VANT 140: linked and integrated

The mandate of VC to innovate is also addressed through faculty and staff engagement in reflection (informal as well as formal through research initiatives)

and dissemination of findings. From the onset, VC faculty members have engaged in sustained discussions about teaching and learning (e.g. via weekly or bi-weekly stream planning meetings, professional development sessions, informal hallway conversations, reading of relevant bibliography) as well as in a range of scholarly activities that include workshops, scholarship of teaching and learning projects, and program evaluation and research studies. The outcomes of this ongoing work provide us with crucial information about instruction, the students' academic socialization and learning trajectories. This in turn helps us to identify gaps in programming and teaching. The present work reflects, among other things, the interest in researching how SFL – as a pedagogical innovation – is used in the curriculum by instructors across VC, including for example in shaping the relationship between the foundational writing course and the more specialized VANT 140 courses.

4. Registers of the VC Academic English Program

A first step towards mapping the registers in focus across the four VC streams was taken in mid-2017. We collected information from AEP instructors about the types of assessments undertaken in VANT 140, the rationale behind the assessments, learning outcomes addressed (from the VANT 140 course as well as connections to linked disciplinary course(s) and to the foundational LLED 200 course), and relevant additional background details (such as steps in the design process; lessons and materials that scaffolded the assignment; reflections on the effectiveness of the task; suggestions for future use). For the analyses of registers in focus across the VANT 140 courses that are reported on in this paper we have drawn on this initial mapping of assessments (Zappa-Hollman & Murphy 2017).

The distribution of explicitly instructed and assessed registers across the curriculum is shown in Figure 4 for the Science and Applied Science streams and Figure 5 for the Arts and Management streams. Both figures show the registers taught in the foundational LLED 200 writing course as dots in the inner-most ring, while the outer rings show the registers taught in the more discipline-specific VANT 140 courses in the sub-streams. These dots identify both the register that is instructed and, as indicated in the key, the content course that this register is linked to.

Before discussing the findings presented in these figures, it is important to explain our choices for classifying macroregisters and hybrid registers. For the purposes of this study, macroregisters are classified by a nuclear register, such as the chronicling register of the chemistry lab report. In Applied Science, this macroregister also contains categorizing, explaining, and arguing; however, it is

the chronicling of the experimental procedure – the register that fulfils most pointedly the function of a lab report in chemistry – that is deemed nuclear.

As for hybrid registers, most hybrids in our AEP curriculum combine registers that are adjacent in the typology; in the figure, the hybrid registers are located on or near the boundaries of the two registers. Notable hybrid registers are those of explaining and categorizing as a hybrid within expounding registers, and hybrids of expounding and exploring. The approach to classifying hybrid registers that are not adjacent in the typology is broadly developmental. We identify hybrid registers in the register typology based on the saliency of the registers that are combined; among the salient registers, the one used to identify is the more developmentally advanced, such as arguing in the science VANT 140 debates, which typically assumes apprenticeship in more foundational registers such as identifying and explaining.

Figure 4 shows that the foundational LLED 200 writing course is relatively limited in the number of registers taught and assessed, four, with a concentration in the single-term, 39-hour course on expounding registers. The spread of registers in the various VANT 140 courses – which run for two terms – is wider, and reaches well beyond the registers addressed in the foundational writing course in the directions both of reporting and exploring. This variation reflects the length and number of courses involved; however, the variation also reflects the importance given to instruction provided in the foundational writing course for understanding register variation more generally, and undergirding the development of discipline-specific literacies across the VANT 140 courses.

For example, while many of the VANT 140 courses involve instruction in non-expounding registers, the assignment assessment rubrics in the VANT 140 courses universally refer to lexicogrammatical variables (recontextualized as Organization, Interpersonal Positioning, Content, and Logic), introduced through instruction in (and around) the expounding registers introduced in LLED 200. This observation also applies to the relationship between registers instructed in the foundational writing course and the adjunct VANT 140 courses in the Arts and Management streams, shown in Figure 5.

Focusing on the four registers taught in LLED 200, we note from Figure 4 that they span the subtypes of expounding registers, including, in the (counter-clockwise) order of instruction, a definition with extended description (categorizing), a response-to-feedback assignment (combining explaining and categorizing), a commentary on visual data with extending explanation (explaining), and a problem-solution text that combines explaining and arguing. (The first assignment in LLED 200, a description, is one of the three highly-weighted registers that are discussed in more detail below.) This counter-clockwise trajectory corresponds to the typical order of development in History literacy (Coffin 2006),

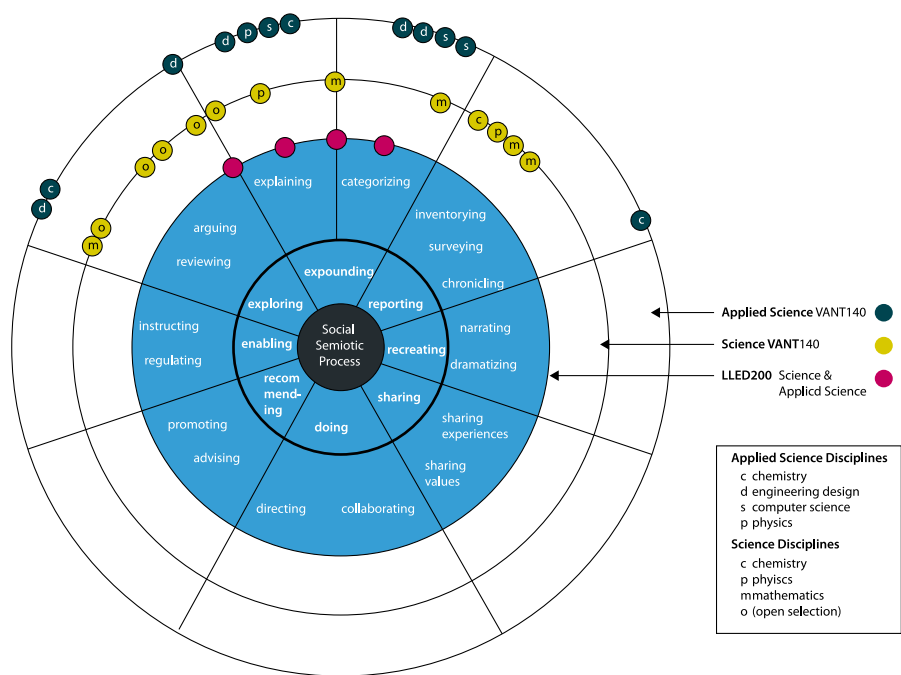


Figure 4. Instructed registers of the VC Science and Applied Science streams, including foundational writing course (LLED 200) and content-linked courses (VANT 140). Figure design adapted from Matthiessen (2015: 39, Figure 21)

which progresses towards registers of expounding and exploring. In this way, the order of registers instructed within the foundational course aligns with recognized patterns of disciplinary literacy development. We return shortly to details of the trajectory indicated by the registers of VANT 140 Science.

The comparison of registers taught in the VANT 140 courses in the two streams of Sciences and Applied Sciences reveals that both streams address the same scope of three general registers of reporting, expounding and exploring, and do not go beyond these. The streams also distribute the register instruction similarly, with the exception of the single reporting register in Applied Science, the chemistry lab report. However, the figure does not show the relative weighting of the registers between and within courses, which is relevant in the case of this lab report. Although the chemistry lab report is the only reporting (macro)register formally taught and assessed in this stream, this chiefly chronicling register accounts for the bulk of instruction in the VANT 140 course component linked to chemistry in Applied Science. (The chemistry report in Applied Science is another of the three highly-weighted registers that are discussed in more detail below.) In comparison, the instruction in chemistry literacy in the Science VANT 140 is relatively light,

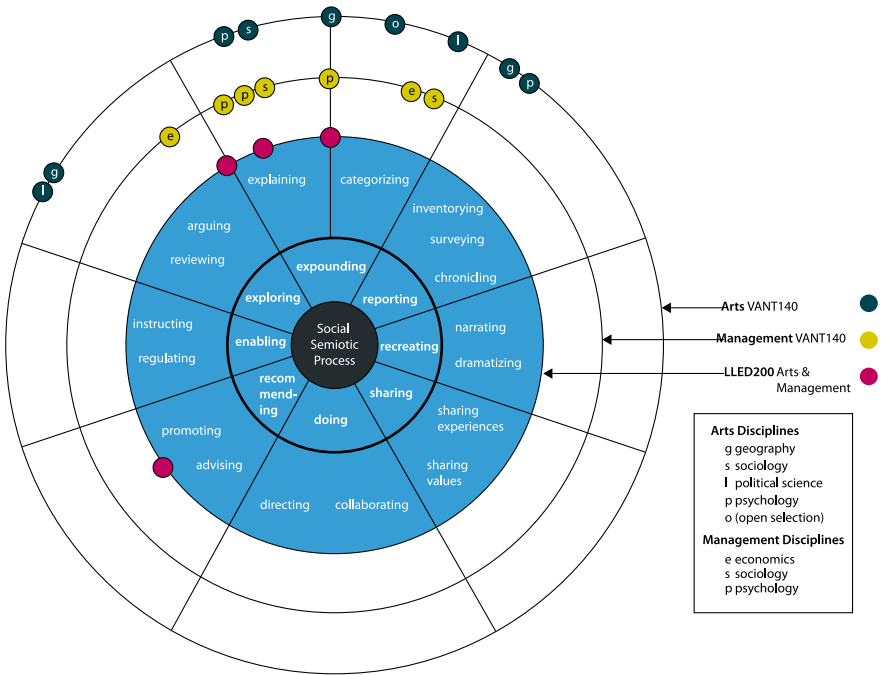


Figure 5. Instructed registers of the VC Arts and Management streams, including foundational writing course (LLED 200) and content-linked courses (VANT 140). Figure design adapted from Matthiessen (2015: 39, Figure 21)

comprising weekly wiki entries in which students write definitions for chemistry (as well as math and physics) vocabulary (an inventorying register) that is relevant in the forthcoming week in the respective content course. These tasks in chemistry in the VANT 140 Science course are lightly-weighted relative to the chemistry reports in the Applied Sciences. As noted, Figures 4 and 5 do not reflect these differences in weighting between the two streams.

In contrast, it is evident that mathematics and physics are well-represented among the Science VANT 140 registers. The case of math is interesting. The wide registerial repertoire for math shown in the figure may be associated with the long-term collaboration and early development of resources between the AEP and calculus instructors, who, additionally were aligned in recognizing the benefits of students' expanded capacities for explaining and arguing for their choices in solving calculus problems. For example, in the VANT 140 course, students annotate videos of their professor solving calculus problems, identifying the stages of the solution but also providing reasoned arguments involving the alternative choices (not taken) for solving at each stage and the rationale for the choice taken. Students later upload their own solutions, which are similarly annotated by peers (for

details, including of the innovative learning management and video annotation software used, see Arts Instructional Support and Information Technology 2016). From the perspective of the primary calculus instructor, the aim of this approach to numeracy is for students to remain open to the potentials of mathematical reasoning and avoid the pitfalls (especially as they advance in science) of approaching calculus problem types unreflectively with prepared solution “recipes”.

Another aspect of the registers of VANT 140 Science worth highlighting is the predominance of an “open” choice of disciplinary focus in the exploring registers. The majority of these are accounted for by instruction and practice of debates in the second term of the course. A consensus among students and the AEP instructors that the issues debated be selected on the basis of students’ interest and investment within the scope of science, rather than drawn exclusively from disciplinary courses. When debates were first introduced, students were required to draw questions from issues directly related to content from their disciplinary courses. However, these first-year students had difficulty engaging in extended debates of issues associated with the technical content from their content courses. A common complaint was that, as first-year students, they lacked the depth of understanding of the technical content that is desirable for extensive argumentation.

If detailed, technical argumentation is too steep a challenge for first-year science students, the choice to open the VANT 140 Science course to non-specialist registers of argumentation can be understood as a countermeasure that accommodates the still-developing overall science literacy levels of the student cohort and the AEP instructors. The nature of the learner path indicated by the registers of VANT 140 Science, and of this particular easing into exploring and arguing, can be highlighted with the typology. By adapting the register typology to account for the progression from the literacies of home to those of schooling and on to university and professional practice, Matthiessen (2015: 40) maps the typical learner path in high-school history literacy advanced by Coffin (2006). In the general path of history literacy learning, the progress from recreating with stories to arguing history corresponds to a centrifugal movement towards tertiary levels of literacy.

Figure 6 shows the path in science literacy learning indicated by the order of registers instructed in VANT 140 Science. A centrifugal pattern towards the professional literacy (outer rings) is observed from reporting to expounding registers; however, as the course moves to speech-intensive debates and exploring, contextual pressures from field and tenor force the centripetal counter-movement towards less specialized registers of science associated with secondary school.

The question of opening the discipline-specific VANT 140 courses to English for general academic purposes (EGAP) is an important one that we cannot address adequately here. We can report, nevertheless, that even though students may be committed to the topic of debate, for instance, the weight of the investment appears

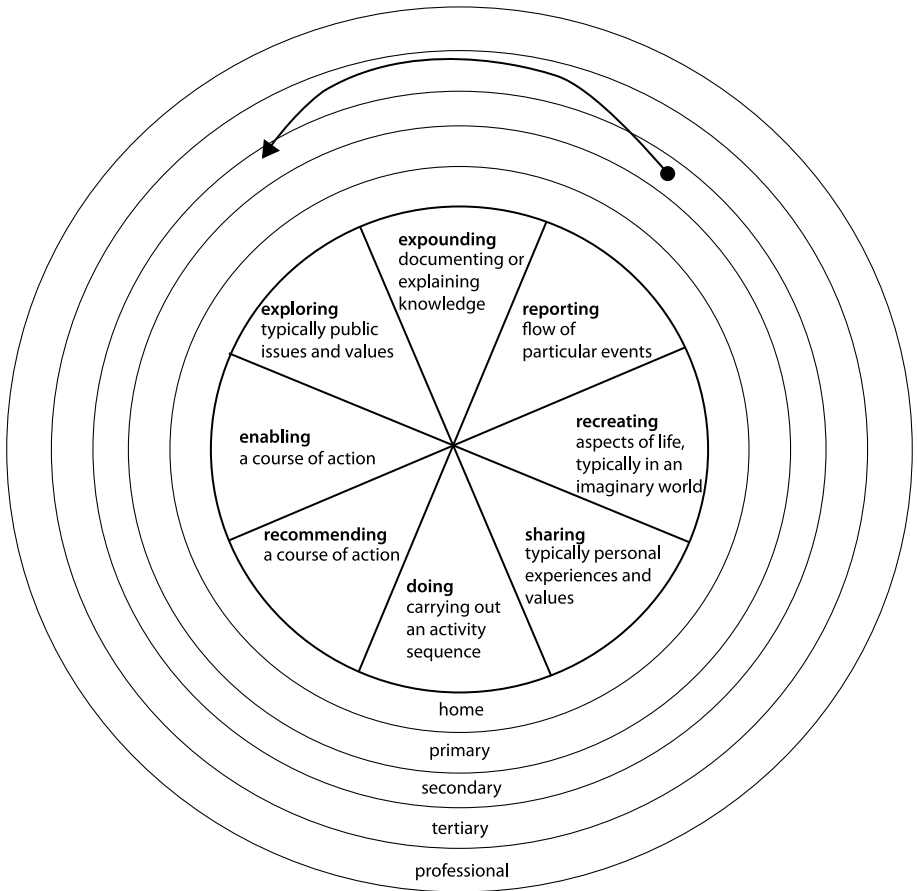


Figure 6. Learner path in VANT 140 Science: movement to tertiary science literacy in expounding followed by shift back to secondary science literacy in exploring. Figure design adapted from Matthiessen (2015: 40, Figure 22)

to be diminished relative to the generally more concentrated attention given to registers also taught and assessed in their content courses. However, good arguments arise for the practice of EGAP in this syllabus. For example, students and AEP instructors express a general appreciation for the escapades from the content course material. Also, AEP instructors have reported that students are more likely to enact unfamiliar social positions in such contexts as debate, potentially expanding their registerial repertoires interpersonally as well as in other ways. This phenomenon is encouraging for the argument registers that debate is expected to foster, especially in speech.

An additional benefit of structuring the VANT 140 course around generalized academic registers such as debating is that the structure is then easily transposed

to other courses. Among other things, this means that the VANT 140 course would not have to be heavily revised if the linked content course is revised, such as when the content instructors change. This argument for such “peel-on/peel-off” syllabi has occasionally arisen among AEP teams. Also important in considering generalized academic content in the Science stream are the many contexts in which arguing general science knowledge and associated registers carry significant weight; proficiency in engaging with popular science is valued in the Science Communications course (SCIE 113) as well as the standardized Language Proficiency Index (LPI) test (an institutional language test most international Science students at UBC must pass in order to be able to complete further required communication coursework). The most heavily weighted section of the LPI is a short written argument. On this matter, the AEP faculty in the Science stream have also discussed options for helping VC students to prepare for this test, an intervention that would significantly depart from the specialized literacy focus of the VANT 140 course. While extending instruction in argumentation, this intervention might also facilitate students’ progression in their chosen majors.

As can be seen from Figure 4, in contrast with the Science VANT 140 register inventory, all of the registers in the Applied Science VANT 140 are associated with a discipline. This distribution is at least in part an effect of the linked model of VANT 140, in which each VANT 140 course links to a specific content course. While non-specialist registers are not restricted from these courses, they occur with far less intensity and frequency than in the Science stream.

The alignment of specific registers in the typology within and across streams provides valuable insights. Consider, for example, the hybrid register in the Science and Applied Science LLED 200 comprising categorizing and explaining. This register occurs in the response-to-feedback task in which students identify a salient instance of the instructor’s corrective feedback on their writing in each of the three metafunctions, and explain their understanding of the issue identified in the writing and their (language-based) approach to revising. In accordance with the interest in encouraging students’ internalization of language-based strategies for accelerated disciplinary literacy, the weight of the grade is on the explanation, which is hybrid in that it embeds functional linguistic description of the salient features of the writing and explanation of the issues identified in the corrective feedback. The same register type, a categorizing-explaining hybrid register, is present in the Science VANT 140 course. This is the assignment, mentioned above, in which students describe and explain their choices for solving a calculus problem. What the scope of this practice of combining the registers of explaining and categorizing tells us is that, across the program and at foundational levels in syllabi, students are taught and expected to talk, write, and think about language very similarly to the ways they engage with disciplinary content.

Applying the distinction between English for general academic purposes (EGAP) and English for specific academic purposes (ESAP) to learning about language as we do to learning other disciplinary content, it is evident that students learn about language both as a general academic topic and as a focus of specialized disciplinary practice. Findings such as these highlight the integration of language and content in the curriculum.

The LLED 200 course is also foundational in language-based disciplinary literacy development in the Arts and Management streams. Figure 5 shows the instructed registers in these streams. While the Science and Applied Science LLED 200 course begins with a descriptive writing assignment, in the Arts and Management, the first register taught is an email request. Swales and Feak (2000) label such registers “supporting genres”; this choice reflects the interest in students’ general professional literacy in a currently unstable register laden with potential pitfalls for those uninitiated in institutional discourses. This register is the outlier in LLED 200 identified in Figure 5 as recommending (at the lower left of the typology) since the email involves requesting that the instructor take a course of action for the student. The implications for modality and tenor relations are evident, as are the material implications of the semiotic exchange. In this case, satisfactory completion of the interaction predicts an appropriately cautious request prompting the instructor to accept information and take action.

Interestingly, one of the motivating factors behind the recent introduction of descriptive writing into the Science and Applied Science LLED 200 syllabus (Ferreira et al. 2018) was the interest in establishing points of contrast between registers, raising awareness early on in the syllabus of register variation (see below for further discussion). The email assignment in the Arts and Management stream serves a similar purpose by establishing a starkly contrasting register to that of the next assignment, the extended definition, particularly in terms of tenor.

While the registers of the primary assignments in the Arts and Management LLED 200 course are the same as those for the LLED 200 in Science and Applied Science in title, the requirements differ somewhat. A key difference is that the extended definition assignment in the Arts and Management LLED 200 course calls for explanation rather than description. So aside from definition, descriptive registers are not explicitly taught in the Arts and Management stream’s writing course. This comparison is relevant to possible future curriculum development in view of the distribution of inventorying and categorizing registers, and also of hybrid registers of categorizing and explaining, in various VANT 140 courses linked to a number of disciplines across both Arts and Management substreams. These registers account for almost half of the registers formally taught in VANT 140, raising a question about the potential benefits of buttressing instruction in descriptive writing in the foundational LLED 200 course for this stream.

It has been noted that the VANT 140 courses in Arts and Management concentrate on expounding registers. Correspondingly, relatively few exploring registers are formally taught and assessed. This is unexpected, given the known interest in argumentation in these faculties, including of course in first year. This possible gap may reflect the lack of delicacy in the data, analysis, or typology. Notably, those assignments that do involve exploring include students' linguistically-informed reflections on their writing and other discursive practices, indicating that students in these streams are also expected to learn about language and apply this knowledge reflectively and indeed argumentatively as a part of their disciplinary literacy development.

5. Registers in focus: descriptive report, chemistry lab report, and podcast

5.1 Description in the foundational writing course in Science and Applied Science streams

LLED 200: introduction to Academic and Professional Registers is a foundational writing course in the Science and Applied science streams in which language-based strategies for register variation are explicitly taught and from which variation is expanded in the disciplinarily more specific VANT 140 courses in these streams.⁵ As reflected in the two variations of LLED 200 in the Science/Applied Science and Arts/Management streams, the initial version of the course used at VC (similar to the present Science/Applied Science version) has been revised for the Arts and Management streams. However, in both streams the course continues to develop. To approach specific disciplinary registers in the VC AEP curriculum from the perspective of their foundational role in the curriculum, we focus first on a recent development in this writing course.

In the Science/Applied Science streams, the registerial point of departure of the writing course was changed from explanation to description. This change in the choice of the description occurred in conjunction with another important development in the foundational course in the Science stream, which the available space allows us merely to mention. In revising Unit 1 of the writing course, we also sought to pare down the number of informing theoretical concepts explicitly discussed.

5. This writing course was first introduced to VC as a revised form of an SFL-based, register-oriented writing course first developed by Ferreira for social science students at late undergraduate and graduate levels in another research-intensive university, where it was found to be generally successful in supporting students' academic writing development (Ferreira 2016).

Previously, the unit opened with a series of tasks linking academic discourse conventions and language through concepts of social purpose, genre, staging, and register. This was determined to be top-heavy theoretically, as not all these concepts could be explicitly addressed and reflected upon, so the opening focused on register variation in academic settings analyzed metafunctionally. This development, which reflected more of a shift in emphasis than a deep recalibration (as will become evident in the analyses below), helped reduce the conceptual frontloading early in the course while streamlining the metafunctional model of register and focusing instruction on language-based strategies of register variation.

To help understand the change to the opening of the writing course from explanation to description, we point out that these registers are grouped together within the register typology as registers of expounding. That is, the two registers are both concerned with decontextualized knowledge enacted as documentation rather than as, for example, chronicle or argument. As indicated in a detail from the typology shown in Table 2, the documentation may range from theoretical and speculative explanation near the boundary with exploring registers to the description of attributes, at the opposite boundary of expounding registers, where description is similar to the inventory registers of reporting.

Table 2. Differentiations within the expounding sector (Matthiessen 2015)

consequential	sequential	causal	conditional	factorial	taxonomic	descriptive
explaining					categorizing	
expounding						

The two main sub-types of expounding registers are categorizing and explaining. As the discussion below illustrates, this boundary between expounding sub-registers can be challenging to identify. At the boundary between the more delicate registers of categorizing and explaining, Matthiessen (2015:10) identifies factorial explanations at the categorizing-like end of explanations, and taxonomic descriptions at the explanation-like end of categorizing. While at first factorial explanations and taxonomic descriptions may appear to be clearly distinguishable, the categories do fade into each other, especially when the constituents of a phenomenon construe, in taxonomic terms, factors that lead to the phenomenon. An example of the overlap arises in a hyper-theme of a science student’s descriptive writing draft:

Stars have their own evolution, their life stages are divided to Nebula, Protostars, Main Sequence Star, Red Giant, Planetary Nebula, and stars, like our sun, they will end up with White Dwarf.

To an important extent, this hyper-theme about the life stages of stars predicts a sequential explanation in which each stage is a factor leading to the next stage and, eventually, the star's death. However, the Process "are divided" construes a categorical field; indeed, the hyper-theme also predicts a more categorical construal of the stages, whereby stages are differentiated from each other using disciplinary taxonomies, as might be illustrated in a sequence of pictures of stars in various life-stages, where the factorial aspect of each stage is merely implied. In such a description, furthermore, more extensive sequential and factorial explanations may be embedded in the text's microstructure, realizing a description with embedded explanation. We return to this boundary between explaining and categorizing shortly, after presenting some rationale for refocusing the beginning of the writing course on description.

The decision to begin the course with description is supported by Halliday's (1989) list of grammatical challenges in scientific English, most of which are centrally implicated in identifying and describing: "interlocking definitions, technical taxonomies, special expressions, lexical density, syntactic ambiguity, grammatical metaphor, and semantic discontinuity" (p. 15). These features

are not arbitrary, but have evolved to meet the needs of scientific method, argument, and theory. As learners master these features, they are also mastering scientific concepts and principles. (ibid.)

Many of these challenging features of scientific English are associated with description, a register often treated as relatively basic in academic literacy development (e.g. Ravelli 2004). The registers of description are foundational across science discourse, as implied by Halliday. These claims match our observations of issues in the written explanations and arguments of earlier science cohorts at VC (text-types instructed through a data commentary and other assignments for explanation, and a problem-solution text for argumentation), which in many cases did not meet expectations for these text types. For instance, regardless of the target register, texts tended to show similarly imprecise deployment of science taxonomies and principles, and unreliable authorial positioning often associated with overstated claims and explicitly subjective positions (Ferreira et al. 2018).

A focus on description in the opening lessons and first major assignment – such as the careful planning, previewing, and deployment of taxonomies and associated positioning of the writer as recognizably descriptive – was expected to establish a marker to which the apprentice scholars could reliably orient in navigating the highly variable social semiotic spaces of university science and applied science. The initial instructional means of achieving this was to distinguish description from explanation, whereby the former is typically realized through the explicit deployment of established taxonomies and a descriptive

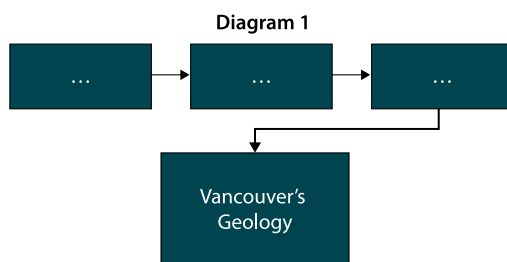
stance while the latter typically predict complex, metaphorical construals of causal logical relations and often more contingent positions associated with claims of correlation and causality. Subsequently, most instructors also explicitly taught theme-based strategies for embedding explanations within descriptions, often in response to students' interest in elaborating individual descriptive categories.

To help teach the distinction between description and explanation, we initially sought model texts directly from a science discipline; however, time constraints led us to write model descriptions and explanations based on disciplinary texts. These were authenticated as discipline-relevant by, in this case, the instructor in Earth and Ocean Sciences (Geology). Early in this lesson cycle, students were given the task of matching descriptive and explanatory texts with diagrams of the schematic structure of the texts (Figure 7).

The material initially sensitizes students to the respective ideational and textual profiles of the two general science registers. The description (Assignment A) matches with the schematic taxonomy (Diagram 2) representing the static sub-categories (of rock) comprising Vancouver's geology. Correspondingly the world construed in the descriptive writing is largely one of relations between entities rather than a world of events and actions (Kress & van Leeuwen 2006). Here, events are construed as abstract and technical entities, which, as it happens, are presented not in the natural order of their geological formation but of prevalence within the taxonomy of the city's geology (e.g. pre-quaternary rocks are stratigraphically prior to the quaternary rocks, but are the least common in the city and, therefore, the last to be described).

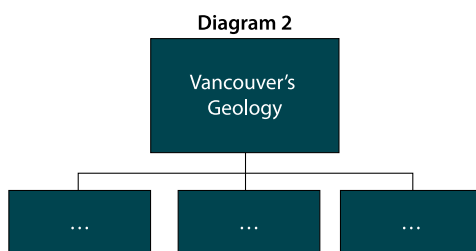
In contrast, the sequential factorial explanation (Martin & Rose 2008) of the geological formation of the area (Assignment B) is illustrated with a schematic diagram in which three factors in sequence culminate in the focal phenomenon, the city's surficial geology. The world construed in the written text is one of events and actions, the factors in the region's geological formation. Relative to the description, the explanation construes a dynamic set of events, as illustrated by Diagram 1.

The lesson cycle, which also serves to introduce the three metafunctions in the science stream, proceeds to highlight variation in interpersonal positioning, which would typically be more cautious in the explanation than in technical description. However, as the specific factors explained in Assignment B are uncontroversial, none of these claims is hedged. While students recognize the value of limiting claims, this is frequently a source of difficulty for this student population; for example, students over-rely on modality, often favouring explicitly subjective positions, a finding analogous to Schleppegrell's (2004b) in chemistry lab reports. In the sample text, however, the writer does limit the explanation as a whole, with the loading of contingency in positioning realized heteroglossically



Assignment A. Describe the surficial (surface) geology of Vancouver

The surficial geology of the City of Vancouver comprises various lithostratigraphic features that are associated with the area's glacial history and location beside a large river delta and ocean inlet. A dominant surficial geological feature is glacial drift. Glacial drift is late-Pleistocene deposits of till, stream gravel, sand, boulders, and shell. Another important but less common geological feature is the later, Holocene deposits of gravel, sand, clay and till from glacial retreat and melt-out. Also evident within the city's limits are small areas of Pre-Quaternary sandstone and shale.



Assignment B. Explain a key factor in the geological formation of Vancouver

The geology of Vancouver is the result of many complex processes. However, in explaining Vancouver's geological formation, geologists recognize glacial rebound as a key factor. At various times during the Pleistocene and Holocen Epochs, the low-lying area now occupied by Vancouver was covered by glaciers as much as two kilometres thick. During glaciation, the weight of the glaciers caused the underlying rock to sink. As the glaciers retreated and melted and their weight was removed, the sunken rock gradually rebounded upwards above the current sea level. This rebound exposed the large deposh of glacial sediment, which is evident in the much of the surficial geology of the city as gravel, sand, boulders, till and clay.

Figure 7. A science writing task on distinguishing description and explanation
Match each assignment with a diagram

and also re-construed experientially: initially, the explanation is construed as limited in view of the “many complex” factors involved in the geological formation of the area. Subsequently, the voice of geologists is introduced – they “recognize glacial rebound as a key factor” – to justify the narrower scope of the claim and thereby contribute to the reliability of the explanation. The sample texts help highlight resources for positioning claims in ways beyond modality (explicitly taught in a subsequent course unit). As such, the claims advanced in the description do not raise (nor preclude) questions of writer reliability.

When the writing course turns in subsequent units to a focus on explanations, students are asked to represent the causal relations schematically as: identify phenomenon X; explain the factors: X happens because A happens; X happens because B happens; X happens because C happens (see Halliday 1998). This logically explicit, congruent construal of the logical relations helps clarify the nature of causal relations in the text. With such a schematic awareness of causal relations, students are in a position to recognize the language of causality as used in the text, such as through prompts about the variety of congruent and metaphorical construals of causal logic.

By pedagogically isolating description, we achieved the dual aims of instructing students in a key but, in our context, under-taught register of science, while also developing students’ capacity to recognize and enact register variation very early in the course. Using longer writing samples from geology, the students were also instructed in how these registers may mix in specific texts, as in the common case mentioned above (in the context of life-stage of stars) of descriptions based on taxonomies adopting functional criteria, i.e. where the concept is identified within a causal sequence. In such cases, where the description embeds explanation, the students were alerted to the central role of hyper-themes in orienting readers to description as the primary field value at stake in context and, furthermore, that scholarly contexts can accommodate explanation as well as other registers in subordinated or coordinated relations with description, provided the language choices and the writers’ interests as well as other features of context are synchronized.

The informal consensus among the AEP instructors in the Science and Applied Science streams familiar with the previous Unit 1 in the course is that the writing coming in from the current cohort is better organized and thus easier to follow compared to that of previous cohorts, including contexts that call for mixing description and explanation (Ferreira et al. 2018).

As discussed in this section, the relationship between the curriculum context and the treatment of the registers of description and explanation is marked by the relatively long history of the writing course as SFL-informed and register-focused. Developments in the treatment of these expounding registers occur in a context

of (1) a curriculum developer and instructor relatively experienced in using SFL in EAP (e.g., the revisions are informed by published, SFL-based descriptions of science registers and knowledge of the interests of stakeholders in the foundational course); (2) refocusing of the scope and timing of metalinguistic concepts explicitly introduced in the course; (3) the specific challenges observed in student writing of descriptions and explanations, and the cross-referencing of these with the relevant research; and (4) the institutionally-supported collaboration between the Academic English Program and disciplinary instructors.

5.2 Lab report writing in the chemistry VANT₁₄₀ course in applied sciences

The teaching and learning of chemistry lab report writing in CLIL typically occurs in a context of challenges familiar across technical disciplines: chemistry faculty with limited experience teaching writing, language specialists with limited chemistry knowledge, and junior chemistry students with little familiarity with the registers and genres of academic chemistry (Stoller et al. 2005). This profile applies to the VC applied sciences stream but with important caveats concerning the disciplinary and AEP instructors involved. The instructor of the chemistry course *APSC 182 Matter and Energy I* has heightened sensitivity to the features of professional and student writing in the field beyond the sensitivity that may be expected among his peers in chemistry. In his third year in the program, he had collaborated relatively extensively with AEP instructors of the linked VANT 140 course to the extent of co-presenting and co-publishing research with the previous AEP instructor on the teaching of writing in chemistry (Murphy & Potvin 2016; Murphy & Potvin 2017).

The current AEP instructor of the VANT₁₄₀ chemistry course inherited the instructional materials developed by the previous AEP instructor and built on them as he continues the collaboration with the disciplinary instructor, maintaining the focus of the VANT 140 course on lab report writing. Like his predecessor, the present AEP instructor participates in the chemistry labs and writes reports himself; these reports are read by and discussed with the chemistry instructor or a teaching assistant. He also maintains the assessment structure whereby the lab reports assigned to pairs of students in the APSC 182 course are assessed in the VANT 140 course from the view of instructed language features of lab reports (outlined below). However, while for APSC 182 the reports are assessed once and generally summatively, for VANT 140 they are assessed formatively, given detailed feedback, and resubmitted for a second assessment.

The current AEP instructor teaching VANT 140 linked to APSC 182 has a background in using SFL to research collaborative second-language academic writing. This background informs his choices in the teaching of the chemistry lab

report in VANT 140. The chemistry lab report assigned in the APSC 182 course is a macroregister involving expounding (describing and explaining results), reporting (chronicling lab procedures) and exploring (discussing results). The VANT 140 syllabus states that students will be able to

identify conventions of organization, presentation, and language use in the APSC 182 lab report genre and adhere to these conventions to produce effective lab reports; for example, students, in their reports, will be able to *explain* relevant physical chemistry concepts clearly; *describe* experimental procedures precisely; present and *discuss* results effectively; and use citations appropriately.

(emphasis in the original)

This scope of registers of the lab report and the VANT 140 course overlaps with the registers explicitly taught in LLED 200. This fact is emphasized in the instructor's introductory slides to the VANT 140 course, which add to the above description of the course aims an animated text reminding students of the "link to LLED 200".

According to the chemistry instructor, VC students are typically challenged not by technical calculations but by reflecting on and recounting the experiment according to specific assignment guidelines and disciplinary norms. The challenges tend to cluster around expounding, particularly explanation, including in explanations of experimental errors and of the chemical processes themselves. For example, explanations for observed phenomena may be facile and poorly cross-examined. A link is made between these issues and the students' writing load: the chemistry courses for VC students and students in the direct entry program cover the same content, but VC students are tasked with completing five reports in pairs or groups of three during the first term course while the direct entry students are assigned two or three.

The VANT 140 instructor reports writing challenges in the various registers that comprise the lab report. About the process more generally, the students' collaborations in pairs on the writing tasks are often found to be uneven, and this phenomenon is considered a factor in the persistent issues that arise in the writing. In the procedure stage, students often enact an enabling procedural register with the Mood choice of commanding readers to act rather than choices that chronicle the procedures with informing statements. (The instructor suspects the students may be misinterpreting the instructor's guidelines for writing the procedure as a model for writing it.) Consistent problems arise in Theme choices, the use of thematic patterns, and associated choices of active or passive voice, affecting Information Focus and flow. Across the report, students tend to rely too much on Processes in construing their lab observations; the instructor provides an example of this: "The boiling water fluctuated on its surface", which contrasts with a

preferred, nominalized construal such as “the fluctuating surface of the water”. Instruction in VANT 140 addresses features of identifying, explaining, describing, and discussing in the chemistry lab reports by focusing on the multiple functions of theme choices, active/passive voice, cohesion, process types, and grammatical metaphor, including deverbal nominalization and logical grammatical metaphor.

The instructor reports that while many of the listed challenges persist in the students’ texts, improvements are evident, including to students themselves. Early in the VANT 140 course, the instructor presents students with the results from an exit survey of the previous cohort about their experiences in the course, indicating that

71% of students either agreed or strongly agreed that ‘Getting written feedback from the professor and TA and revising my lab reports have helped me improve my English-language lab report writing skills’.

Furthermore, “75% of students also reported that language-focused feedback enhanced their understanding of ‘scientific concepts involved in the labs’”. These results are indicative of students’ sense of benefitting from explicit, language-based instruction in the VANT 140 course. The instructor’s priming of students in such a direct way for receiving feedback and revising indicates the instructor’s commitment to a recursive approach to instruction in the focal macroregister.

5.3 Analysis of a podcast episode using sociological concepts in VANT 140 Management

A major learning outcome of the sociology courses is for students to develop a sociological perspective on complex, everyday issues such as social inequality, social institutions and social change. To this end, students engage in a variety of activities that include listening to podcasts dealing with different perspectives on these topics, reading relevant materials, completing in-class tasks such as quizzes and discussions as well as a series of assignments, one of which is a one-page analysis of a podcast episode. The recent inclusion of this macro-register in the sociology course reflects what has been identified as a new trend in academia to bring podcasting to school. (See Samson 2017 for an overview of how some Canadian institutions are using podcasting for educational purposes.)

To scaffold students’ completion of the sociology paper, the VANT 140 AEP instructor, working in close collaboration with the sociology instructor, designed an oral presentation assignment that was closely aligned with the one-page paper assignment requirements. Similar to the paper version, the oral presentation assignment calls for a summary of the selected podcast (from a menu of choices sourced from the SOCI 102 class), an analysis (explanation) of the podcast drawing

on a relevant theory/concept from sociology, followed by a discussion of the limitations of the podcast and/or concept/theory.

The mixed expounding and exploratory nature of the podcast assignment is consistent with the registerial characteristics of the disciplinary assignment (i.e. the sociology paper). Key differences, however, relate to the mode, as the podcast assignment supports students' development of speech (primarily) through the performance of an oral presentation while the one page paper is written. Another distinguishing aspect is that the oral presentation is accomplished in groups whereas the one page paper is an individual effort.

A series of six lessons leading up to the assignment were designed by the AEP instructor to scaffold students' understanding and completion of the oral podcast assignment. The tasks in the first lesson, for example, involved listening to a podcast and analyzing it for experiential "content" to identify the key participants involved, and from there determine the podcast's intended audience and purposes. The second lesson included tasks that compared features (across meta-functions) of spoken versus written texts. To this end, students analyzed excerpts of transcripts of a podcast they had listened to earlier, this time noticing how specific lexicogrammatical choices realized the text's meaning in context. The students were then asked to reflect on whether these choices in the spoken text would be present in an academic written text on the same topic. Subsequent tasks in this lesson had students practise turning spoken-like texts to written-like texts particularly by increasing the level of abstraction through the use of nominalization (again, relying on instruction provided in the foundational writing course).

Lesson three in this series asked students to work in small groups to compose two parallel texts on the same topic: a summary of key ideas represented in the podcast. One text was meant to be speech-like and presented to peers while the other text was meant to represent the kind of writing students would produce for the sociology course. Once students completed this task, they were prompted to suggest ways in which the second text could be analyzed from a sociological perspective by drawing on a theoretical concept. This set up the context for the next lesson, which had the more ambitious goal of helping students consolidate information through the completion of a more elaborate task, done in groups:

Choose one sociological concept/theory you would like to use to analyze Race Card. Use your notes from the previous VANT 140 SOCI classes and your notes and readings from SOCI 102 to analyze the Race Card episode of the Colour Code Podcast. With your group, write a paragraph which analyzes the podcast using a sociological concept/theory. Once you are finished, you will be asked to write your paragraph on the board to compare your analysis with other groups.

Think about the stages that should be included in this analysis. These stages can then be used to also help you write and present your own ideas from the podcast and sociological concept/theory of your choice.

1. A topic sentence which outlines the ideas presented in Race Card and the sociological concept/theory which you will use to analyze the podcast
2. A description of the main ideas or specific details you will use to analyze the podcast in relation to a sociological concept or theory (You will probably want to cite the podcast here)
3. An explanation of how that sociological concept or theory can be used to view the podcast (You will probably want to use an additional academic source here)
4. An explanation of why this is significant to the broader scope of sociology

(VANT 140, Term 2, 2016–2017, lesson 5, designed by Jennifer Lightfoot)

As shown in the lesson extract above, the complexity of the tasks increases as the lesson series progresses, from identifying key ideas and gaining awareness about text type features through linguistic magnification tasks, to eventually creating a text (collaboratively with other peers) that mirrors the requirements of the assignment in the linked sociology class. Clear links can also be drawn between the staged organization of the assignment and the registers of definition and explanation that students had also been introduced to in the context of the LLED 200 foundational writing course, which adds to the relevance and importance of the focus of instruction on these registers. The VANT 140 course, in this way, provides students with opportunities to transfer their newly developed awareness of and familiarity with those registers and practise recontextualizing this knowledge for a disciplinary oriented task. The aspect of relevance, from the student perspective, is not a minor one as it enhances the potential of transfer of the “strategies” taught in the language-focused course to the content-focused courses (James 2006).

An interesting point to highlight in relation to this lesson series focusing on the macro-register of podcasts is its portability; namely, the possibility to recycle the podcast presentation series of lessons, with some minimal adaptation, and export it to other contexts and disciplinary streams. This “peel-on/peel off” element is highly attractive in a context where instructors, courses, curriculum and/or materials used may change, which inevitably calls for modifications to the language-oriented courses linked to the corresponding disciplinary-oriented courses.

Having provided an overview of the disciplinary registers and their relations within the AEP curriculum embedded in first-year university studies, as well as examining three of these registers in additional detail, we now proceed to a discussion of these findings. We also include some suggestions to continue this

line of work and identify important implications for teaching and curriculum development.

6. Discussion

This paper has explored the relationship between the registers taught and assessed in the Academic English Program at UBC Vantage College and the context of curriculum. For this work, we have relied on survey data from program instructors, our own knowledge and experiences in curriculum development, instruction, and program administration amassed since the program planning stage, and the results of other research emerging from the program. This study of register-curriculum relations began with the premise that the AEP is already uniquely positioned for supporting and preparing first-year international students for their respective programs of study. Two of the more distinctive features of the program are the institutional support for collaboration between language specialists and instructors across a large number of disciplines, and the choice of SFL as the AEP's informing theory of language. We also recognize more fundamental factors in play, such as the position of UBC as a large, well-resourced research university, the decision to innovate in the institutional structure by establishing VC, and the key mandate of this unit to innovate pedagogically.

The analysis of specialist registers from the context perspective was aided by the context-based register typology. Specialist registers are investigated from above as well as from the "all around" perspective of the typology as a system of meaningful choices. The benefits of this typology include the differentiation of registers relevant to scholarship across disciplines, the integration into a single framework of academic and non-academic registers, and other crucial parameters such as the degree to which the register is ancillary to, or constitutive of, the social activity, the degrees of field specialization and associated institutional relations implicated.

While the study methods used here are significantly limited, especially in the scope of the data, they have produced valuable insights about the relationship between register, specialized language pedagogy, and curriculum at various levels of delicacy. The typology has provided a broad perspective on the architecture of the AEP, notably on the articulation of the foundational LLED 200 writing course and the discipline-specific VANT 140 courses. The analysis indicates this structure for coordinating instruction in general and specialized academic registers is an effective means of catalyzing awareness of the functions of language across different scholarly practices. For example, the selection of a range of expounding

registers in LLED 200 Science and Applied Science provides a suitable base for expansion into the many more registers taught in VANT 140 in these streams.

The nature of the coordination between the two courses is a focus of ongoing curriculum development. For example, the recent development in the LLED 200 for Science and Applied Science on the teaching of descriptive registers is likely to provide students with an improved foundation for the many registers of reporting and categorizing that they face in their disciplinary courses (Ferreira et al. 2018). The typology-based analysis of register-curriculum relations also identified potential gaps in the articulation between general and more specialized registers. And while the LLED 200 syllabus in Arts and Management sets up a metalinguistic foundation for explaining and exploring (and even recommending, in the email assignment), a possible gap was identified between the many registers of reporting and categorizing in the VANT 140 courses, and the absence of explicit instruction in the latter in the LLED 200 course. This finding points to a potential focus for curriculum development in those streams.

The variability found in the degree of coordination between the LLED 200 course and the VANT 140 courses draws attention to the role of the metalanguage introduced in the foundational course in bridging the gaps between more familiar and less familiar registers. As explained by Matthiessen (2006), advanced language development parallels the process of field specialization, suggesting that increasingly delicate choices in functional grammatical systems are expected in the VANT 140 courses, choices that build on the more general systems of choice introduced in LLED 200. This appears to be the case, for example, in the instruction of chemistry lab reports in VANT 140 in Applied Science, a macroregister shared with the linked content course that calls for learners to extend what they understand from LLED 200 about chronicling, categorizing, explaining, and arguing.

A crucial intervening factor is the opportunity students are given to practise register variation in discipline-relevant, instructional tasks. Such tasks generally provide the experiences of meaning-making in context on which students can reflect and to which they can apply their metalinguistic knowledge. In this relation, the LLED 200 and VANT 140 courses also appear complementary. Relatively more time is given to raising metalinguistic awareness in the foundational course, while the specialist-oriented VANT 140 courses are expected to provide more opportunities for immersion in disciplinary practices. This relative distribution of instructional focus across the two courses on metalanguage and disciplinary tasks points to complementarity in learning language through immersion in meaningful tasks, learning content through language and learning about language.

Several insights into more specific aspects of the relationship between register and curriculum have emerged from this study. The analysis illustrates that

registers from the AEP and the content courses occupy the same locations in the typology, indicating that VC students engage with language as content in similar ways as for their “focal” disciplinary content. As noted, disciplinary content knowledge and knowledge of language both receive attention in their general aspects and as fields of specialist practice deployed for highly specific purposes. We reported that, given the option of researching disciplinary writing based on understandings from the writing course of how language works in the production of specialist knowledge, science students are capable of gaining surprisingly sophisticated insights into subfields of interest (Ferreira 2018). These experiences are additionally valuable in highlighting the relation, especially in students’ minds, between the production of valued disciplinary knowledge, language systems and language choices.

In such ways, the study has drawn attention to the nature of trajectories for learning catalyzed by the curriculum and changes therein. In the syllabus of VANT 140 Science, for example, we observed instructional support for movement from reporting to expounding and exploring, where the latter implies explicitly reflective and critically-engaged dialogue on scientific claims. As shown in Figure 6, the movement through reporting and expounding registers occurred with a corresponding movement in the typology towards more specialized registers. In a previous iteration of the syllabus, this movement continued into the exploring register of debate; however, the practice of debating new, technical knowledge proved unreasonably challenging for the first-year students (and the AEP instructors) so the movement in exploring registers was reversed from specialization to one of popularization in science. This development appears to provide a more suitable context for debating science in first year.

Another specific aspect of the program that has been highlighted concerns collaboration of language-oriented and disciplinary faculty. These collaborations are especially important in view of the AEP instructors as ethnographers of disciplinary discourse practices whose SFL-informed descriptions are manifest directly in instructional materials designed to enable learners to understand and engage effectively in their respective scholarly communities. The cases of teaching of sociology through podcasts and of chemistry in lab reports highlight the value of such collaborations. Consistent with this view, Humphrey et al. note that

Increasingly, SFL specialists are working collaboratively with subject teachers and literacy tutors who, while expert users of academic language themselves, have not had specialist training in SFL and have not developed a metalanguage for making understandings explicit to students. (2010:186)

However, for various reasons, not all opportunities in the institutional arrangement for such collaboration at VC are taken and challenges certainly remain.

Chief among these are the typically (but not exclusively) one-way direction of information between disciplinary instructors and AEP instructors. AEP instructors commonly seek knowledge of disciplinary discourse from their colleagues. Disciplinary instructors, despite demonstrating interest in the role of language in knowledge construction and curiosity about the SFL approach and how it potentially links to their disciplinary courses, vary considerably in their attention to the interests and activities of the AEP.

One means of addressing such challenges has been professional development workshops for disciplinary instructors in each of the streams. The most successful of these (e.g. the original prompt for the sociology instructor to adapt her assessment rubric to an SFL-informed framework) uses a matrix, adapted from the 3X3 framework developed by Humphrey et al. (2010), to understand the typical features of academic writing as a general register. These features are differentiated by the three parameters of field, tenor and mode in rows, and three scales of whole text, text phase, and clause in columns, thus identifying nine general sectors to attend to in reflecting on academic writing practice.

In the workshop, participants are given a microcase of a very specific writing issue, such as:

My economics assignment is to describe the BC government's economic policies in softwood lumber industry. I understand that my main task is to identify the key characteristics of the policies using BC examples. But I'd like to open the description with an interesting anecdote from the Powell River lumber mill. What are the implications of opening with such an example?

Faculty participants use the matrix to identify "entry points" to a pedagogical discussion with the student about their writing in response to this question, and "trajectories" for where that discussion may productively lead across other sectors in the matrix. In cases in which the disciplinary registers of interest to the instructors vary from the general register of academic writing indicated in the matrix, the instructors are generally able to use the metafunctional labels and other features of the matrix to adjust the specific question prompts to suit the more specialized register. Indeed, this workshop task mirrors the sociology instructor's adoption of SFL in her assessment rubric. The task also shows how the SFL approach to register provides a principled model that is adaptable to degrees of specialization among other context variables. A number of disciplinary faculty expressed interest in trying out the matrix in their pedagogical discussions with students. Related research on the AEP supports the claim of an "incipient" systemic perspective among disciplinary faculty (Zappa-Hollman 2017, in press).

The primary context in which AEP and disciplinary faculty collaborate, however, is in the development of instructional materials. Research on the nature of

these collaborations (Murphy & Potvin 2017; Zappa-Hollman 2017, in press) contributes to our appreciation of the investment and commitment such relationships require to be established and sustained. The cases of chemistry and sociology presented in this study extend those insights. The findings of this work have led to improvements in how expectations of collaboration are communicated, supported, and acknowledged (e.g. through formal workload allocation and explicit description of expectations of collaboration between AEP and other faculty), and also point to the multiple forms and purposes that these collaborations can take in a context like VC. An examination of such collaborations also yielded powerful examples of the outcomes of such partnerships (e.g. awareness of the inextricable connection between language-content by disciplinary specialists, which in turn led to curriculum and instruction revisions to include appropriate types and levels of scaffolding; a deeper understanding of disciplinary registers and practices by AEP faculty, which also informed VANT 140 curriculum revisions; see below for more on this aspect).

The present project provides a very high pass on registers and their relation in the VC curriculum. Among the many challenges and opportunities that remain, we are keen to investigate the program more closely in the areas of teaching and learning, particularly the lesson cycles within and across course syllabi, carried out in conjunction with the analysis of student work. Such fine-grained pedagogical research calls for a complementary framework for conceptualizing pedagogical discourse; in researching and practicing CLIL, we have found Bernstein's (1990) model and the work of Llinares, Morton and Whittaker (2012) helpful.

The role of the AEP instructors in understanding and recontextualizing academic discourse for students cannot be overstated. Our professional development is of course also ongoing, especially in view of the relative novelty of SFL among most instructors, our role in using SFL to describe and teach academic and disciplinary registers, and the ongoing process of curriculum development. As distinct from teaching a "teacher-proof curricula" and even "teachers as active implementers" of curriculum, the aim in the AEP is for instructors to be "partners in curriculum development", whereby instructors are

oriented toward discovery of curriculum potential, change and transformation of materials, and devising of new alternatives" including new aims for the curriculum. (Connelly 1980:106)

We note, in this relation, the great need for investigating and supporting teachers' roles in the development of specialized language curricula in tertiary settings, and hope that the small excursions into this area taken in the paper catalyze these developments. In particular, the paper can provide insights into what can happen when the systemic approach touches down in a context with

leadership and support as well as experienced and dedicated AEP teachers who are, for the most part, new to SFL.

We are encouraged, therefore, by several action research projects that have been recently designed by instructors in areas of collaboration with disciplinary instructors, lesson design and individualized feedback that systematically supports students' academic literacy. These initiatives are associated with a constellation of factors including exchanges between faculty working on the same stream (in planning meetings, informal conversations), professional development workshops on SFL (by Ferreira), overviews of CLIL models (by Zappa-Holman) and showcasing of examples of SFL-informed instruction and CLIL in action (by VC instructors in AEP program meetings) and strong encouragement by leadership (in VC and other academic units) to engage in such activities. The enthusiasm displayed by faculty working in such projects further suggests the initial effort to draw on SFL and CLIL as theoretical and pedagogical frameworks, albeit in diverse ways and levels, has been taken up by faculty in our program. This is by no means a suggestion that the alignment with, or interest in, SFL has been straightforward or fully successful; yet we can comfortably speculate that the many interactions about language and learning in general have significantly contributed to sparking curiosity and motivation among faculty members embarking in the above mentioned projects, in addition to serving as catalysts for curriculum and pedagogical change.

Before closing with reflections on the typology and implications for future research, we would like to reflect briefly on the case for the current directions in the curriculum based on program evaluation and emerging research. Data from student exit surveys, for instance, has revealed that most students (67% of respondents to the VC program evaluation exit survey 2016–2017) evaluated their experience in the program as highly positive, with 89% of respondents in the same survey reporting feeling confident to continue with their second year studies in their respective faculties, i.e. outside the sheltered VC context. Many students identified the AEP courses and tutoring sessions as one of the most (if not the most) helpful aspects of the VC program in preparing them to embark in “regular” studies with UBC's direct-entry student population. This is illustrated by the sample comments from the 2016–2017 VC program evaluation exit survey:

I think the AEP session is the most helpful thing I had in Vantage and I hope I could still use that in the following years after I left Vantage.

I think I spend a good time in vantage collage because it procide [sic] me more English skill to help me to fit to university life.

Preliminary analysis of a small set of diagnostic data – a pre- and post- writing sample collected at the start and end of the second teaching term – also showed improvement in student academic writing in all aspects of the register in focus (a data commentary, an expounding text type, calling for analysis of data presented in a figure). The pre- and post-treatment (i.e. instruction) samples examined revealed that student texts increased in lexical density (from an average 4.99 to 6.04 lexical units per ranking clause) while they became less grammatically intricate (from 1.73 to 1.40 ranking clauses per clause complex), signalling improvements in both aspects. An analysis of self-reference (identified initially as a weak aspect of these texts given its overuse by students), also showed a significant reduction of inappropriate use of first person pronouns. This likely resulted at least in part from a focus on strategies for interpersonal positioning in the LLED 200 course. Similarly, an instructional focus on organizational strategies appears to have led to improvements at the macro-level organization as well as at the paragraph and clause-levels through more effective thematic progression patterns and more adequate use of cohesive devices, including a reduced reliance on conjunctions (Jones 2010).

Student self-reports in program evaluation surveys also point to perceptions of a marked improvement in academic writing. According to program evaluation survey data from the 2016–2017 academic year, for instance, about 75% of respondents thought their academic writing had improved, about 25% thought it had significantly improved, while only 4.3% did not report improvements in this aspect. Overall, while 12.2% of respondents in Survey 1 (completed at the start of the academic year 2016–2017) saw their ability to write academically as “poor”, at the time of Survey 3 (completed about 10 months later) this percentage was reduced to 3.3%, with most of the respondents indicating either a fair (32%), good (48%), very good (13%) or excellent (2.4%) ability to write academic texts. These findings provide further evidence of students’ linguistic and academic literacy development.

In moving ahead with program development, a compelling new conceptual addition to the curriculum is the context-based typology. As we continue to explore its use, we – and the other AEP instructors – can draw on the empirical insights it has provided here. As discussed above, the findings from analysis of the curriculum using the typology have provided corroborating evidence for the robustness of the current curriculum architecture, including recent changes in the curriculum such as buttressing instruction in descriptive registers in the foundational writing course for Science and Applied Science students. The typology has also provided fresh insights, notably a principled perspective on the registerial scope of syllabi across the curriculum, which, in turn, affords an unprecedented perspective on the articulation of registers across the foundational and more discipline-specific courses. By means of this perspective, we observed gaps in this

articulation of registers across syllabi that had not previously been identified. The typology of registers across the curriculum also showed us the strong continuity between registers of the AEP and those of disciplinary courses, that instruction and tasks in a number AEP courses treated knowledge of language in ways very analogous to the specialized knowledge students engage with in the disciplines.

We recognize the untapped potentials of the context-based register typology to help address these. An important benefit of the typology is that it draws together meanings across the spectrum of activity as “either primarily social or primarily semiotic – i.e. either primarily a process of interactive behaviour or one of exchanging meaning” (Matthiessen 2015: 6). In so doing, the typology helps us address a fundamental intellectual challenge:

Every meaningful social practice can be enacted only through some material processes [...] The unity of ecosocial systems is somewhat hidden from view by our failure to appreciate the pervasiveness of the material-semiotic coupling.

(Lemke 1993: 250–251)

The registers analyzed in this study clustered at the top of the typology, where language is overwhelmingly constitutive of the social activity. A hint of the registers in which this constitutive function of language is slightly reduced emerged in the assignment of an email request for students to write to their instructor, a recommending register that calls for a semiotic and material response from the instructor. Given that our criteria for selecting registers for analysis in this study was that they be taught and assessed, there remains a broad range of registers that are relevant to students’ academic socialization, including such areas as classroom engagement and experiential learning through the manipulation of objects. Classroom engagement stands out as another area of practice particularly deserving of attention. For example, over several years, the identification and assessment of classroom participation have been topics of ongoing discussion and change in the AEP. The focus in this study on the formally taught and assessed registers prompts us to want to know more about the nature of language and literacy learning in the program across a wider scope of curricular registers.

References

- Arts Instructional Support and Information Technology. 2016. *Alfredo Ferreira in Vantage College uses CLAS for linking language in math practice*. Retrieved from <https://clas.sites.olt.ubc.ca/alfredo-ferreira-in-vantage-college-uses-clas-for-linking-language-in-math-practice/>
- Bernstein, Basil. 1990. *The structuring of pedagogic discourse, volume 4 of Class, codes and control*. London: Routledge & Kegan Paul. <https://doi.org/10.4324/9780203011263>

- Biber, Douglas. 2006. *University language: A corpus-based study of spoken and written registers*. Amsterdam: John Benjamins. <https://doi.org/10.1075/scl.23>
- Brinton, Donna M., Marguerite A. Snow & Marjorie B. Wesche. 1989. *Content-based second language instruction*. New York: Newbury House.
- Brinton, Donna M., & Marguerite A. Snow (eds.). 2017. *The content-based classroom: New perspectives on integrating language and content* (2nd edition). Ann Arbor: University of Michigan Press. <https://doi.org/10.3998/mpub.8198148>
- Byrnes, Heidi, Hiram H. Maxim & John M. Norris. 2010. Realizing advanced L2 writing development in a collegiate education: Curricular design, pedagogy, assessment. *Modern Language Journal, supplement*, 94. 1–202. <https://doi.org/10.1111/j.1540-4781.2010.01136.x>
- Christie, Frances & Beverly Derewianka. 2008. *School discourse: Learning to write across the years of schooling*. London: Continuum.
- Coffin, Carolyn. 2006. *Historical discourse: The language of time, cause, and evaluation*. London & New York: Continuum.
- Coffin, Carolyn. 2017. Systemic functional linguistics: A theory for integrating content-language learning (CLIL). In Ana Llinares & Tom Morton (eds.), *Applied linguistics perspectives in CLIL*, 91–103. Amsterdam; Philadelphia: John Benjamins. <https://doi.org/10.1075/llt.47>
- Connelly, Michael F. 1980. Teachers' roles in the using and doing of research and curriculum development. *Journal of Curriculum Studies* 12 (2). 95–107. <https://doi.org/10.1080/0022027800120202>
- Dreyfus, Shoshana J., Sally L. Humphrey, Ahmar Mahboob & James R. Martin. 2016. *Genre pedagogy in higher education: The SLATE project*. Basingstoke, UK: Palgrave Macmillan. <https://doi.org/10.1007/978-1-137-31000-2>
- Duff, Patricia A. 2010. Language socialization into academic discourse communities. *Annual Review of Applied Linguistics*, 30. 169–192. <https://doi.org/10.1017/S0267190510000048>
- Ferreira, Alfredo A. 2016. Grammatical metaphor and the social genesis of abstraction in the writing of apprentice scholars using English as an additional language. Unpublished doctoral dissertation. University of British Columbia, Canada.
- Ferreira, Alfredo A. 2018. Catalyzing EAP students' language knowledge in student-led research projects on disciplinary writing. Presentation at *The association of B.C. teachers of English as an additional language (BC TEAL) conference*. May, 2018, Vancouver, Canada.
- Ferreira, Alfredo A., John Pringle & Sandra Zappa-Hollman. 2018. Findings from refocusing the foundation of L2 science writing instruction on description. Paper presented at the *2018 International systemic functional congress*. Boston, USA.
- Halliday, Michael A. K. 1978. *Language as a social semiotic: The social interpretation of language and meaning*. London: Edward Arnold.
- Halliday, Michael A. K. 2004[1980]. Three aspects of children's language development: Learning language, learning through language, learning about language. In Yetta M. Goodman, Myna M. Haussler & Dorothy S. Strickland (eds.), *Oral and written language development: Impact on schools*. Reprinted in Michael A. K. Halliday. 2004. *The language of early childhood, volume 4 in the collected works of M. A. K. Halliday*, 308–326. Edited by Johnathan J. Webster. London & New York: Continuum.
- Halliday, Michael A. K. 1989. Some grammatical problems in scientific English. *Australian Review of Applied Linguistics* 6. 13–37. <https://doi.org/10.1075/aralss.6.02hal>

- Halliday, Michael A. K. 1998. Things and relations: Regrammaticising experience as technical knowledge. In James R. Martin & Robert Veal (eds.), *Reading science: Critical and functional perspectives on discourses of sciences*, 185–235. London: Routledge.
- Halliday, Michael A. K. 2005[2002]. Computing meanings: Some reflections on past experience and present prospects. In Guowen Huang & Zongyan Wang (eds.), *Discourse and language functions*, 3–25. Beijing: Foreign Language Teaching and Research Press. Reprinted in Michael A. K. Halliday, *Computational and quantitative studies, volume 6 in the collected works of M. A. K. Halliday*, 239–267. Edited by Jonathan J. Webster. London & New York: Continuum.
- Halliday, Michael A. K., & James R. Martin. 1993. *Writing science: Literacy and discursive power*. London: Falmer.
- Halliday, Michael A. K. & Christian M. I. M. Matthiessen. 2014. *Halliday's introduction to functional grammar* (4th edition). London: Routledge.
<https://doi.org/10.4324/9780203783771>
- Hasan, Ruqaiya. 2005. Semiotic mediation and three exotropic theories: Vygotsky, Halliday and Bernstein. In Ruqaiya Hasan's *Language, society and consciousness, volume 1 in the collected works of Ruqaiya Hasan*, 130–156. Edited by Jonathan J. Webster. London: Equinox.
- Hasan, Ruqaiya. 2005[1973]. Code, register and social dialect. In Basil Bernstein (ed.), *Class, codes and control (2nd volume)*, 253–292. London: Routledge & Kegan Paul. Reprinted in Ruqaiya Hasan's *Language society and consciousness, volume 1 in the collected works of Ruqaiya Hasan*, 160–193. Edited by Jonathan J. Webster. London: Equinox.
- Humphrey, Sally, James R. Martin, Shoshana J. Dreyfus & Ahmar Mahboob. 2010. The 3 × 3: Setting up a linguistic toolkit for teaching academic writing. In Ahmar Mahboob & Naomi K. Knight (eds.), *Applicable linguistics*, 185–199. London & New York: Continuum.
- Hyland, Ken. 2004. *Disciplinary discourses: Social interactions in academic writing*. Ann Arbor: University of Michigan Press.
- James, Mark A. 2006. Transfer of learning from a university content-based EAP course. *TESOL Quarterly* 40 (4). 783–806. <https://doi.org/10.2307/40264308>
- Jones, Alan. 2010. Why are logical connectives sometimes detrimental to coherence? In Ahmar Mahboob & Naomi K. Knight (eds.), *Applicable linguistics*, 200–220. London & New York: Continuum.
- Kress, Gunther R., & Theo van Leeuwen. 2006. *Reading images: The grammar of visual design* (2nd edition). London & New York: Routledge. <https://doi.org/10.4324/9780203619728>
- Lehki, Priyanka, Meghan Allen, M., Fok-Shuen Leung, Brett Gilley, Georg Rieger & Joanne A. Fox. 2017. The development and delivery of a research course for first-year international students. *Essays in Teaching and Learning*, X. 143–154.
<https://doi.org/10.22329/celt.v10i0.4734>
- Lemke, Jay. 1993. Discourse, dynamics, and social change. *Cultural Dynamics* 6 (1). 243–275.
<https://doi.org/10.1177/092137409300600107>
- Llinares, Ana, Tom Morton & Rachel Whittaker. 2012. *The roles of language in CLIL*. Cambridge: Cambridge University Press.
- Lukin, Annabelle, Alison R. Moore, Maria Herke, Rebekah Wegener & Canzhong Wu. 2011. Halliday's model of register revisited and explored. *Linguistics and the Human Sciences* 4(2). 187–213. <https://doi.org/10.1558/lhs.v4i2.187>


- Martin, James R. & David Rose. 2005. Designing literacy pedagogy: scaffolding democracy in the classroom. In Ruqaiya Hasan, Christian Matthiessen & Jonathan J. Webster (eds.), *Continuing discourse on language: A functional perspective (first volume)*, 251–280. London: Equinox.
- Martin, James R. & David Rose. 2008. *Genre relations: Mapping culture*. London: Equinox.
- Matthiessen, Christian M. I. M. 2006. Educating for advanced language capacities: Exploring the meaning-making resources of languages systemic-functionally. In Heidi Byrnes (ed.), *Advanced language learning: The contribution of Halliday and Vygotsky*, 31–57. London & New York: Continuum.
- Matthiessen, Christian M. I. M. 2009. Meaning in the making: Meaning potential emerging from acts of meaning. *Language Learning* 59. 211–235.
<https://doi.org/10.1111/j.1467-9922.2009.00541.x>
- Matthiessen, Christian M. I. M. 2015. Register in the round: Registerial cartography. *Functional Linguistics* 2 (9). 1–48. <https://doi.org/10.1186/s40554-015-0015-8>
- Matthiessen, Christian M. I. M. & Kazunori Teruya. 2015. Registerial hybridity: Indeterminacy among fields of activity. In Donna Miller & Paul Bayley (eds.), *Permeable contexts and hybrid discourses*, 205–239. London: Equinox.
- McCabe, Anne & Christopher Gallagher. 2008. The role of the nominal group in undergraduate academic writing. In Carys Jones & Eija Ventola (eds.), *From language to multimodality: New developments in the study of ideational meaning*, 189–208. London: Equinox.
- Miller, Ryan T. & Silvia Pessoa. 2016. Role and genre expectations in undergraduate case analysis in information systems. *English for Specific Purposes* 44. 43–56.
<https://doi.org/10.1016/j.esp.2016.06.003>
- Miller, Ryan T. & Silvia Pessoa. 2017. Corpus-driven study of information systems project reports. In Vaclav Brezina & Lynne Flowerdew (eds.), *Learner corpus research: New perspectives and applications*, 112–133. New York & London: Bloomsbury.
- Murphy, Michael & Gabriel Potvin. 2016. Integration of chemical engineering education and English language training for first-year international students: A collaborative approach. *CSCHe Conference*. Quebec City, QC.
- Murphy, Michael & Gabriel Potvin. 2017. Helping EAL science and engineering students write better lab reports. *Teachers of English as a Second Language (TESL) Canada Conference*, Niagara Falls, ON.
- Nesi, Hilary, & Sheena Gardner. 2012. *Genres across the disciplines: Student writing in higher education*. New York: Cambridge University Press.
- Ortega, Lourdes. 2015. Syntactic complexity in L2 writing: progress and expansion. *Journal of Second Language Writing* 29. 82–94. <https://doi.org/10.1016/j.jslw.2015.06.008>
- Parodi, Gioavani (ed.). 2010. *Academic and professional discourse genres in Spanish*. Amsterdam: John Benjamins. <https://doi.org/10.1075/scl.40>
- Ravelli, Louse J. 2004. Signalling the organization of written texts: Hyper-themes in management and history essays. In Louise J. Ravelli & Robert A. Ellis (eds.), *Analysing academic writing: Contextualised frameworks*, 104–130. London: Continuum.
- Ravelli, Louise J. & Robert Ellis (eds.). 2004. *Analysing academic writing: Contextualized frameworks*. London & New York: Continuum.
- Rose, David. 2014. Analysing pedagogic discourse: An approach from genre and register. *Functional Linguistics* 1. 1–32. <https://doi.org/10.1186/s40554-014-0011-4>

- Samson, Natalie. (2017, November). Podcasting goes to school. *University affairs*. Retrieved from <http://www.universityaffairs.ca/features/feature-article/podcasting-goes-school>.
- Schleppegrell, Mary J. 2004a. *The language of schooling: A functional linguistics approach*. Mahwah, New Jersey: Erlbaum.
- Schleppegrell, Mary J. 2004b. Technical writing in a second language: The role of grammatical metaphor. In Louise J. Ravelli & Robert Ellis (eds.), *Analysing academic writing: Contextualised frameworks*, 172–189. London & New York: Continuum.
- Stoller, Fredricka L., James K. Jones, Molly S. Costanza-Robinson & Marin S. Robinson. 2005. Demystifying disciplinary writing: A case study in the writing of chemistry. *Across the disciplines*, 2: *Special issue on the linguistically diverse student*. Retrieved from <https://wac.colostate.edu/atd/lds/stoller.cfm>.
- Swales, John. 1990. *Genre analysis: English in academic and research settings*. Cambridge: Cambridge University Press.
- Swales, John. 2004. *Research genres: Explorations and applications*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9781139524827>
- Swales, John & Christine B. Feak. 2000. *English in today's research world: A writing guide*. Ann Arbor: University of Michigan Press. <https://doi.org/10.3998/mpub.9059>
- Swales, John & Christine B. Feak. 2004. *Academic writing for graduate students: Essential tasks and skills* (2nd edition). Ann Arbor: Michigan University Press.
- Teruya, Kazunori. 2007. *A systemic functional grammar of Japanese*. London & New York: Continuum.
- Wignell, Peter F. 2007. *On the discourse of social science*. Darwin, NT: Charles Darwin University Press.
- Williams, Geoff. 2016. *Social justice, social class, and literacy development: Thinking beyond 'scaffolding'*. Public lecture at the Department of Language and Literacy Education (LLED), October 24, University of British Columbia, Vancouver, BC.
- Zappa-Hollman, Sandra. 2017. Collaboration between language and content university instructors: How can we make it work? Paper presented at the annual meeting of the *American Association of Applied Linguistics*, Portland, OR.
- Zappa-Hollman, Sandra. in press. Collaborations between EAP and disciplinary instructors: Factors and indicators of positive partnerships. *International Journal of Bilingual Education and Bilingualism*.
- Zappa-Hollman, Sandra & Michael Murphy. 2017. Assessment in adjunct courses: What and how? Paper presentation at The Association of B.C. Teachers of English as an Additional Language (BC TEAL) Conference, Vancouver, BC.

Address for correspondence


Alfredo A. Ferreira
UBC Vantage College
University of British Columbia
6363 Agronomy Road
Orchard Commons 4011
Vancouver, BC V6T 1Z4
Canada

alfredo.ferreira@ubc.ca

 <https://orcid.org/0000-0001-6397-1742>

Co-author information

Sandra Zappa-Hollman
Faculty of Education, Language & Literacy Education
University of British Columbia
Sandra.Zappa@ubc.ca

 <https://orcid.org/0000-0002-9042-3722>