



UNDERSTANDING EFL GRADUATE STUDENTS' DEVELOPMENT IN THEIR MASTER'S THESIS WRITING: A SOCIOCULTURAL PERSPECTIVE

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Abstract

While research on students' development in thesis writing has recently proliferated and much has been revealed about their intramental development and mediating resources, little is known about how students learn and develop from the intermental to the intramental plane with expert others' assistance. To fill in this gap, the study uses Vygotsky's sociocultural approach to development and speaking/thinking system as the conceptual framework and examines two Master's students' thesis writing process with data collected from interviews, stimulated recall, process logs, and multi-drafts of their theses. The findings show that the participants mainly made sense of teachers' meanings, meanings in literature, and their own meanings as they developed from expert others' mediation to self mediation and internalization. These three processes seemed to be intricately interwoven and together contribute to the participants' development of *znachenie slova* and systems of concepts in their speaking/thinking system, with making sense of meanings in literature particularly challenging for them. The factors that facilitated and constrained their sense making are discussed and pedagogical implications are drawn.

Keywords

EFL graduate students, Master's thesis, sociocultural perspective, sense, meaning

1. Introduction

Thesis writing in a second language (L2) has received increasing attention in recent years, probably due to its peculiar features, importance to degrees, and challenges in meeting its requirements (Starfield & Paltridge, 2019). Research shows that writing a thesis is a fruitful process for L2 graduate students to learn and develop themselves and research has often documented their intramental development of knowledge (Casanave, 2010; Ma, 2019; Mochizuki, 2019; Petrić, 2012; Seloni, 2014; Tardy, 2009, 2012; Xu & Zhang, 2019; S. Yu, 2019). It is also found that their intramental development is mediated by an array of resources ranging from people to artifacts and thesis writing is a dialogic and learning-situated activity. While students were found to be faced with many cognitive, emotional and social difficulties, little is known about how students learn and develop from the intermental plane to the intramental plane in thesis writing (Casanave, 2019; de Magalhães, Cotterall & Mideros, 2019; Russell-Pinson & Harris, 2019; Shen, Carter & Zhang, 2019; Wang, 2017). Moreover, research on intramental development has often examined PhD students and their dissertation writing and comparatively neglects Master's students although the latter group outnumbers the former one by over ten to one (Maher & Milligan, 2019; Tardy, 2009). To fill in these gaps, this study will draw on Vygotsky's (1978) sociocultural theory, and two Master's students' English thesis writing experience at a Chinese university and investigate how they develop from the intermental to the intramental plane with expert others' mediation. It is hoped that by understanding this development, the study will shed more light on how students can be better helped to develop through thesis writing.

2. Research on L2 graduate students' development in thesis writing

Research on L2 graduate students' intramental development in thesis writing has often focused on their knowledge construction, among which genre knowledge construction has probably been most discussed, as highlighted in the special issue "Thesis and dissertation writing in a second language: Context, identity, genre" published by the

Journal of Second Language Writing in 2019). Following Tardy (2009), genre knowledge entails integrated expertise in formal knowledge, process knowledge, rhetorical knowledge, and subject-matter knowledge and L2 graduate students have been found to make progress in every domain in thesis writing (Casanave, 2010; Tardy, 2005, 2009). Take Paul, a Master's student in Tardy's (2009) study, as an example, he developed his understanding of its writing style from "formality" to "elegance" and the organization from "providing readers with sufficient background knowledge of the key concepts germane to his research" (p. 186) to being "inextricably connected to both content and the rhetorical goals of the genre" (p. 189) as he wrote and rewrote his thesis. He also built his subject-matter expertise and became a more independent researcher in this process. Casanave's (2010) study demonstrates how three doctoral students deviated from the conventional theoretical framework and academic writing style in their qualitative dissertation writing as they gained more insights into genre knowledge and the uniqueness of their own research. Other types of knowledge have also been explored to shed more light on L2 graduate students' development in thesis writing. For instance, Xu & Zhang (2019) explores how two doctoral students drew on their philosophical views in disciplinary study and developed their epistemology, which further informs their voice in writing.

Research has also revealed the useful resources employed to help L2 graduate students to construct knowledge in thesis writing, including people, artifacts, and their prior experiences (Casanave, 2010; Ma, 2019; Mochizuki, 2019; Petrić, 2012; Seloni, 2014; Tardy, 2009; S. Yu, 2019). Mentoring, instruction, and interactions with advisors, instructors and peers have been found to play a pivotal role in students' intramental development (Casanave, 2010; Ma, 2019; Mochizuki, 2019; Tardy, 2009; S. Yu, 2019). Services offering communication with community members such as individual consultations, dissertation support groups, and group writing conferences are also found useful to help students to better compose their dissertations (Ma, 2019; Mochizuki, 2019; Russell-Pinson & Harris, 2019). Texts are a kind of artefact resources that are frequently employed in students' thesis and dissertation writing, where they can be directly quoted, paraphrased, summarized, and generalized (Casanave, 2014; Petrić, 2012; Tardy, 2005, 2012). Students' prior experiences, including their L1 and L2, cultural background, expertise and disciplinary participation have also been found to be important resources for their development (Seloni, 2014; Tardy, 2012; Xu & Zhang, 2019). For instance, Seloni (2014) observed how a multilingual student successfully drew on his L1 cultural and symbolic capital, discipline knowledge and work experience earned in his home country, Colombia, when studying and writing his L2 thesis at an American university. Tardy's (2012) study shows how students' disciplinary participation help them to learn about the community's genre and build their genre knowledge.

Even with the understanding of genre knowledge and various resources, L2 graduate students' learning and development are still found to be not easy. Written feedback from disciplinary instructors may be rare despite students' desire for such feedback (Neupane Bastola & Hu, 2021; Tardy, 2012). Students have to cope with cognitive, emotional, and social difficulties, with many of them persisting until the end of thesis writing (Paré, 2019; Russell-Pinson & Harris, 2019). Cognitive difficulties are often related to their inadequate knowledge about their disciplines and the thesis genre (Bitchener & Basturkmen, 2006; Casanave, 2019; Shen, Carter, & Zhang, 2019; Tardy, 2009). Emotional difficulties tend to be described as anxiety, stress, insecurities, depression, and anguish caused by the conflicts between their aim to be accepted by the community and failures to meet this aim as well as their illusions of expertise (Paltridge & Woodrow, 2012; Russell-Pinson & Harris, 2019). Social difficulties often involve unproductive advisor-advisee relationship and students' incomprehensive understanding of their own roles and identity as L2 graduate students (Casanave, 2014; de Magalhães, Cotterall, & Mideros, 2019; Wang, 2017).

Although much is known about students' knowledge construction or intramental development, the various resources they draw on, and the many difficulties they are faced with in thesis writing, little has been revealed as to how students cognitively develop or fail to develop with the assistance of resources. Thus, this paper will examine how students' cognition develops from the intermental to the intramental plane in thesis writing and extend the current research on their intramental development by taking Vygotsky's sociocultural approaches as the conceptual framework.

3. Conceptual framework

3.1 Sociocultural approaches to learning and development

Vygotsky conceptualizes development as "the transformation of socially shared activities into internalized process" (John-Steiner & Mahn, 1996, p. 192). Two major themes of Vygotsky's sociocultural approach to development are (a) Individual development has its origin in social sources and (b) human action, on both the intermental and intramental planes, is always mediated by artifacts and community (Engeström, 2015; Wertsch, 1991). Vygotsky's (1978) well-known formulation of the primacy of social interaction in human development is that:

Any function in the child's cultural development appears twice, or on two planes. First appears on the social plane, and then on the psychological plane. First it appears between people as an intersychological category and then within the child as an intrapsychological category.... Social relations or relations among people genetically underlie all higher functions and their relationships. (p. 57)

To project children's development potential from the intermental plane to the intramental plane and from what they at first accomplish in cooperation with others to what they will eventually be able to do independently, Vygotsky (1987) creates the term ZPD, which means "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). While Vygotsky originally uses it to study children, the ZPD has increasingly been used to study development in L2 learning context (Lantolf, Thorne, & Poehner, 2015; Lantolf & Thorne, 2006). In this context, many learners are literate adults who "may spend a great deal of time using L2 materials outside of interaction with another person. And, the definition ignores the impact of assistance that is received via literary sources" (Ohta, 2005, p. 506). In fact, even for the literate children in Swain, Kinnear & Steinman's (2011) study, "the expert other during a ZPD need not be animate but can be cultural artifacts as well" (p. 21), such as charts, flashcards, books, and puzzles in their Grade 4 French immersion classroom. While expert others are redefined to include both people and artifacts for L2 adult learners, the fundamental tenets of the ZPD remains unchanged, i.e. with assistance, learners can outperform what they can do without assistance.

The ZPD concept reveals not only the pivotal role expert others' assistance in students' learning but also the relationship between learning and development. Vygotsky (1978) states that

an essential feature of learning is that it creates the zone of proximal development; that is, learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. Once these processes are internalized, they become part of the child's independent developmental achievement. From this point of view, learning is not development; however, properly organized learning results in mental development and sets in motion a variety of developmental processes that would be impossible apart from learning. Thus, learning is a necessary and universal aspect of the process of developing culturally organized, specifically human psychological functions. (p. 90)

As suggested by Vygotsky, learning through participation leads development and development lags behind learning; this sequence results in the ZPD. In his study of learning by expanding, Engeström (2015) clarifies Vygotsky's implicit understanding of development in the ZPD and points out that when learning gives rise to conscious self-alteration can it often be equated with the typically human type of development. Gallimore & Tharp (1990) identify four stages of the ZPD, namely expert others' mediation, self mediation, internalization, and recursion, to describe learners' development with expert others' mediation being the beginning and foundation of this developmental sequence.

In L2 writing research, the ZPD has often been used to examine how expert others' assistance/feedback mediates learners' revision and writing (Aljaafreh & Lantolf, 1994; de Guerrero & Villamil, 2000; L. Yu, 2020). Aljaafreh & Lantolf's (1994) pioneering work examined how the tutor's negative feedback regulates students' error correction and found that students develop the ZPD along a progression from other-regulation to self-regulation. They argue that students' effective error correction and language learning depend crucially on teachers' graduated and contingent mediation. de Guerrero & Villamil's (2000) examination of L2 peer revision through the lens of the ZPD demonstrated the mutual scaffolding and changing roles in their collaboration. L. Yu (2020) examined how tutor-tutee interactions and revisions mediated a L2 tutee's academic writing and found an indirect relation between the two in which the tutee's improvement in writing often lags behind the tutor's mediation. She argues that the tutee's writing is mediated not only by the tutor, but also by many personal and contextual factors. While these studies have demonstrated the pivotal role expert others' mediation can play in students' L2 writing, the development students can make in their ZPD, and the dialogic nature of L2 writing, little is known about how learning from expert others in the sociocultural context gives rise to students' conscious self-alteration in Engeström's (2015) model or how they develop from expert others' mediation to self mediation and internalization in Gallimore & Tharp's (1990) four-stage ZPD model. To explore this issue, it is necessary to review Vygotsky's speaking/thinking system.

3.2 Vygotsky's speaking/thinking system¹

While Vygotsky recognizes the material base of the human mind, i.e., the physical brain and all its electrical and chemical systems, his focus is always on how the human mind comes into being and how consciousness emerges from the material brain. Vygotsky's speaking/thinking system mainly explores how children think, make meaning, and develop through language acquisition and use in their sociocultural environment, which is also inspiring to L2 education. Vygotsky (1997a) argues that as children develop, a qualitative transformation in their social interactions takes place as communication of meaning is enhanced by the development of the ability to generalize² through "the creation and the use of signs" (p. 55). The unification of thinking and speaking process creates a new unity, which Vygotsky (1987) calls verbal thinking. At the center of verbal thinking is meaning, which is defined by Vygotsky (1997b) as "the internal structure of the sign operation" (p. 133). To understand meaning in verbal thinking, Vygotsky uses *znachenie slova* as the unit of analysis, whose literal translation is "word meaning" in English and expanded renditions are "'meaning through language use' or 'meaning through the use of the sign operation'" (Mahn, 2012, p. 104). Vygotsky's study of *znachenie slova* is different from those focusing on the external meanings of words or semiotic mediation without analyzing the development of their interrelationship with thinking processes (Mahn, 2012). In Vygotsky's (1987) words, "it may be appropriate to view *znachenie slova* not only as a unity of thinking and speech, but as a unity of generalization and social interaction, a unity of thinking and communication" (p. 49, italics in original). Vygotsky (1987) uses meaning to refer to not only internalized sociocultural meaning (i.e. *znachenie slova*), but also types of external sociocultural meaning in context, such as lexical meaning captured in dictionaries, meaning in a social context, and meaning in specific written and spoken language use, highlighting the sociocultural origins of *znachenie slova*.

Vygotsky also uses the concept of sense to reveal the idiosyncratic feature of this internalization process from sociocultural meanings to *znachenie slova*. As Vygotsky (1987) points out,

a word's sense is the aggregate of all the psychological facts that arise in our consciousness as a result of the word. Sense is a dynamic, fluid, and complex formation which has several zones that vary in their stability. Meaning is only one of these zones of the sense that the word acquires in the context of speech. It is the most stable, unified, and precise of these zones. (p. 276)

Although word sense derives from word meaning, there are always degrees of divergence between word meanings and the sense of words. Compared to word meaning, word sense is broader and more fluid; it is inexhaustible and "unique for each consciousness and for a single consciousness in varied circumstances" (ibid). In inner speech, there is "a predominance of the word's sense over its meaning" (Vygotsky, 1987, p. 275).

Vygotsky (1987) also found that by adolescence, children have gone through the early period of thinking in syncretic images and thinking in complex words and reached the level of thinking in concepts and being aware of their own thinking in concepts (Mahn, 2012; Vygotsky, 1987). Concept formation further unifies and develops individuals' speaking/thinking system, which brings about their transformations "*from direct, innate, natural forms and methods of behavior to mediated, artificial mental functions that develop in the process of cultural development*" (Vygotsky, 1998, pp. 168, italics in original). Vygotsky (1987) observes that "the concept arises when several abstracted features are re-synthesized and when this abstract synthesis becomes the basic form of thinking through which the child perceives and interprets reality" (p. 159). He identifies everyday and scientific concepts, with the former arising from learners' day-to-day experiences but being difficult to employ voluntarily and the latter originating in formal schooling and conscious awareness, but being limited by their abstractness and detachment from reality. Scientific and everyday concepts are "internally and profoundly connected with one another" (p. 219) as scientific concepts can rise "only on the foundation provided by the lower and more elementary forms of generalization which previously existed" (p. 177) and can be "transferred structurally to the domain of everyday concepts, restructuring the everyday concept and changing its internal nature from above" (p. 192). It is the link between scientific and everyday concepts as they move in opposite directions that create the ZPD for adults.

For adult L2 learners who have already passed adolescence, their thinking/speaking systems include *znachenie slova*, sense, and system of concepts at their cores (Mahn, 2012). In their learning to write process, the development of their thinking/speaking system involves developing sense and meaning in a new language and sense is not just tied to individual words but also scientific and everyday concepts through everyday interactions

¹ "In describing language use in general, Vygotsky includes writing/written language when he uses speaking/speech" (Mahn, 2008, p.119).

² "Vygotsky uses generalization to refer to the mental act of abstracting from a concrete object to develop a concept of the the object in its manifold manifestations and not to *general* versus *local* meaning" (Mahn, 2012, p. 106).

and interactions in formal academic settings (Lantolf & Thorne, 2006; Mahn, 2008; Vygotsky, 1987). Learners can also draw on the system of meaning constructed through their L1 in their ZPDs and incorporate the new language into their developing system of meanings. Although the phrase “meaning making” appears regularly in educational literature, the cognitive processes in which L2 writers make meanings of their experiences in the sociocultural contexts often remain unexplored (Mahn, 2008). This paper aims to examine the way postgraduates make meanings of the various sociocultural resources and develop their cognition from the intermental plane to the intramental plane in their thesis writing, hopefully shedding light on how their speaking/thinking system develops and how they can be better helped with the assistance of sociocultural resources in their thesis writing processes.

4. The study

4.1 Research question

The research question that guided the study was: *How do Master’s students learn and develop from the intermental plane to the intramental plane in their thesis writing?* In answering this research question, Vygotsky’s sociocultural approaches to development is used as the conceptual framework and a longitudinal case study approach was adopted to allow a microgenetic analysis of the various cognitive changes in thesis writing. For Vygotsky (1978), to examine the origins, the history, and the interconnectedness of phenomena is essential in the study of development. In describing this approach, he emphasizes the “need to concentrate not on the product of development but on the very process by which higher forms are established” (pp. 64-65).

4.2 Context and participants

The study was conducted in the School of Foreign Languages (hereafter the School) at a Chinese university where English was the major foreign language to be taught. The School offered a 3-year MA program in linguistics, literature and applied linguistics and enrolled about 30 students nationwide annually. Most supervisors of the program were professors and associate professors holding PhD degrees in the above disciplines. The program required students to obtain a minimum of 17 course credits in disciplines during the first two years and complete a research project in the third year under staff supervision for their Master’s degrees. To complete their projects, students were required by the School to get their proposals approved at a panel meeting, execute a research design, write an academic thesis in English, pass external examination and oral defence, and submit the finalized thesis.

Invitation emails were first sent to a bunch of second-year Master’s students and two students, Amy and Ivy (pseudonyms), responded to the invitation emails and volunteered to participate in the research after obtaining their supervisors’ consent. Amy and Ivy were both female and born in the 1990s. They obtained their BAs in English on the Mainland, China and were studying in the discipline of Applied Linguistics in the School. Prior to data collection, they had passed all their disciplinary courses which almost exclusively required them to write term papers and were writing proposals for their research projects. By then, Amy proposed to help high school students’ creative writing through multimodal metaphor teaching as she wanted to become a high school English teacher upon graduation; Ivy was interested in statistics, corpus study, and academic writing and followed her supervisor’s suggestion to examine the use of shell nouns in her self-built corpus of native and non-native speakers’ doctoral dissertations for her project.

4.3 Data collection and analysis

Data were collected from multiple sources and lasted for almost a year from June to May in the next year (See Table 1). The participants were first interviewed about their education background, writing experience, what topics they planned to write for their proposals, how they formulated the topics, and how they understood thesis writing, each lasting about 30 minutes (See Appendix A for Interview I questions). They were then invited to use a shared document in the Wechat as the process logs to record any meaningful events in their proposal and thesis writing with a list of questions (See Appendix B) guiding their writing. The researchers could access their process logs any time and keep track of their progress in learning and writing, their interactions with others and their reflections on learning and writing. Other data were sequentially collected in three stages (See Table 1) and three types of data were collected: audio data of their panel meetings, formal meetings with their supervisors, and oral defence; seven drafts from the two participants; and stimulated recall purposefully conducted in Chinese after meetings and oral defence. Transcripts of the audio meeting data, drafts, and process logs were used as the stimuli of the recall to purposely collect how the participants make sense of the meanings in various resources to construct their genre knowledge, particularly how they understood teachers’ feedback and other resources, what changes they planned to make, what revision they actually made, and why they made these revisions. Typical questions used for stimulated recall were, for instance, “How did you understand your supervisor’s words?” “How did you understand your supervisor’s revision of?” “How would you revise this part?” “Why did you write/revise it this way?” and “What did you learn from this meeting?”. Soon after they submitted their finalized theses, another interview was

conducted in Chinese to collect their reflections on the whole writing process and clarify and further probe into the data already collected in the three stages (See Appendix C for Interview II questions).

Table 1: Profiles of participants' data

	Procedures of the participants' research projects	Data collected
Preparation	They were first interviewed for background information of their thesis writing.	Audio data
Process logs	They wrote process logs throughout their whole writing process.	Text data
Stage One: Preparation for thesis writing	They wrote their research proposals.	Text data
	Amy and Ivy had their panel meetings on June 16th and June 19th respectively.	Audio data
	The researchers conducted the first stimulated recall with Amy on Jun. 17th and with Ivy on Jun. 20th.	Audio data
Stage Two: Thesis writing and revision	Amy wrote four drafts and Ivy wrote three drafts in this stage.	Text data
	The participants had face-to-face formal meetings with their supervisors after each submission of their first three drafts and two drafts respectively.	Audio data
	The researchers conducted the second, third, and fourth stimulated recall with Amy on Dec. 14th, Feb. 18th, and Mar. 22nd, the days next to their meetings. The researchers conducted the second and third stimulated recall with Ivy on Jan. 20th and Mar. 13th, the days next to their meetings.	Audio data
Stage Three: External examination, oral defence, and submission of their theses	The participants submitted their fourth and third drafts respectively in early April.	Text data
	The participants had external examiners' evaluation in early May and then oral defences on May 9th and 10th respectively.	Audio data
	The researchers conducted the fifth stimulated recall with Amy on May 10th and the fourth stimulated recall with Ivy on May 11th.	Audio data
	The participants revised drafts and submitted the finalized thesis on May 20th in accordance with the School's requirements.	Text data
	The participants had their second interviews on May 21st.	Audio data

Interview and stimulated recall data were respectively transcribed verbatim by a research assistant and verified by the participants and the researchers. Their transcripts and process logs of each participant were reiteratively read and coded as to how they drew on the various sociocultural resources to formulate their senses, *znachenie slova*, and systems of genre concepts and then develop their genre knowledge, namely formal knowledge, process knowledge, rhetorical knowledge, and subject-matter knowledge following Tardy's (2009) definition. Recurrent themes gradually emerged within cases and were then examined and compared across cases (Miles & Huberman, 1994). Additionally genre analysis of drafts was conducted across different levels ranging from move-step structures (Paltridge & Starfield, 2007) to linguistic and rhetorical features. Intertextual tracing (Prior, 2004) of drafts was adopted to examine the changes or improvements in their performed academic literacy and to triangulate their accounts of genre knowledge learning and development. The codes were repeatedly revised during the whole analysis process until a satisfactory framework was proposed.

5. Findings

Data showed that the two participants mainly made sense of their teachers' meanings, of the meanings in artifacts, and of their own meaning when learning genre knowledge from the intermental plane to the intramental plane during their thesis writing process, with development found in their *znachenie slova* and systems of concepts. The details of their meaning making, learning, and development are presented in the following sections.

5.1 Making sense of their teachers' meanings

It was found that participants always tried their best to make sense of their supervisor teams' feedback and follow their instruction and suggestions, supporting the pivotal role supervisors, tutors, and instructors are playing in students' thesis writing found in previous studies (Casanave, 2010; Ma, 2019; Mochizuki, 2019; Tardy, 2009). Ivy's remarks showed the participants' general attitudes towards teachers in their academic community: "My thesis could not be passed until I obtained their approval. They are experienced researchers from whom I can learn expertise. They have many good resources that I don't; they give me feedback and good ideas. If I can get their endorsement, I feel more confident." (Ivy's second interview)

Their meaning making of these teachers' words were found throughout their whole writing process, inspiring them to find the research topic, structure their theses, polish their language, and learn subject-matter knowledge in particular. At the panel meeting, both participants received critical comments and suggestions on their research topics. When recalling, Amy remarked that

The panel members evaluated my proposal as “a mess”: the constructs are not clearly identified and defined; the research questions are too ambitious; and the experiment design is too simple. I need to learn more about them. (Amy’s first stimulated recall)

Following the teachers’ suggestions, Amy deleted the creative writing part in her project, focused on multimodal metaphor teaching, and redesigned her experiment. Likewise, Ivy also followed her panel’s advice to narrow down her research topic and focused on only one lexicogrammatical pattern of shell nouns rather than her original plan to examine all their patterns.

Their drafts received extensive feedback from their supervisors and examiners, of which they endeavored to make sense and make revisions accordingly. For instance, after receiving her supervisors’ feedback on the structure of her literature review in the first draft, Amy said:

I put all the definitions of constructs in one section and studies on them in another section. But my supervisor said it looked very confusing and redundant.... She asked me to review one key construct comprehensively in one section, including its definition, related concepts, studies on it. ...Some concepts like “modality” “multimodality” are not so important and not needed to be given so much attention. ...I wrote too many simple sentences and short paragraphs, which looked colloquial and naïve. I probably have to revise every paragraph. (Amy’s second stimulated recall)

Her supervisor’s suggestion led Amy to thoroughly revise the overall structure of the literature review chapter, mainly including the following changes: (1) presenting the the main part of the chapter in two sections in correspondence with the two key constructs “multimodal metaphor teaching” and “metaphorical competence” ; (2) omitting details about other concepts such as “modality” and “multimodality”; (3) revising the topic sentences of every paragraph; and (4) correcting numerous linguistic errors. Unlike Amy’s redundant style, Ivy’s literature review in the first draft was evaluated by her supervisor as being “terse”. The excerpt below (Fig. 1) showed her supervisor’s critique of its incomprehensive literature and superficial review.

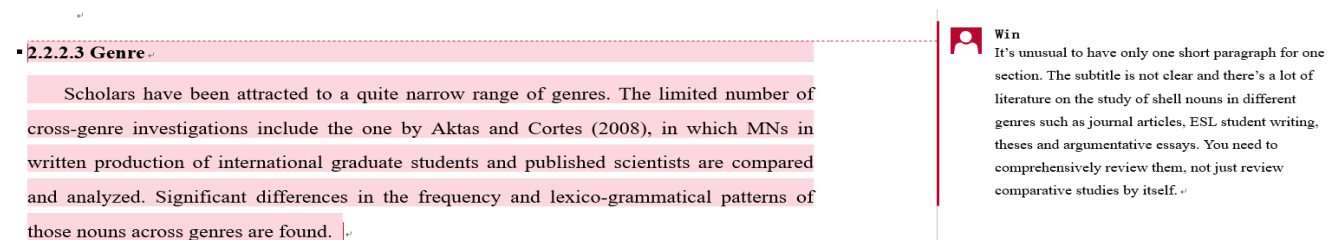


Fig. 1. Screenshot of her supervisor’s feedback on Ivy’s first draft

Their discussion at the meeting further convinced Ivy that she should review more previous studies on shell nouns in genres such as published academic papers and argumentative essays to justify her focus on dissertations. “Little research has specifically been conducted to examine shell nouns in theses and dissertations although there are studies on them in other genres.” She said in her second stimulated recall. Her second draft transformed the initially simple paragraph of 58 words into two more rhetorically-sensitive paragraphs of 545 words.

Amy’s later drafts received further feedback on her language style from her supervisor and suggestions for the presentation of her methodology and pedagogical implications from her examiners, which she again strictly followed until the submission of her finalized thesis. Ivy also followed her supervisor and examiner’s suggestions to revise her later drafts, mainly enriching her literature and refining her data analysis and discussion. In addition to directly learning about genre, the participants also learned from their supervisors that they should read more literature and think more profoundly and independently. Amy was recommended to read Paltridge & Starfield’s (2007) book *Thesis and Dissertation Writing in a Second Language* and follow its guidance on thesis writing and Ivy to read more literature on shell nouns. The following sections would discuss how they made sense of literature and their own meanings, which were found to in turn enhance their meaning making of teachers’ words in the long run.

5.2 Making sense of meanings in literature

The participants were frequently found to read journal articles, books, and others’ theses throughout their writing process, as evidenced by the following excerpts from their process logs, which supports the findings that texts are important resources for students’ thesis writing (Casanave, 2014; Ohta, 2005; Petrić, 2012; Swain, ; Tardy, 2005, 2012).

I searched for literature about multimodality and multimodal metaphor and read 6 journal articles. (Amy's process log, August 24)

I read Lakoff & Johnson's (1980) *Metaphors we live by*. (Amy's process log, September 3)

I read the book: *Corpus and the application of Python*. (Ivy's process log, September 2)

During revision, their literature reading was found to focus on different aspects of the thesis genre in correspondence with their supervisors' different demands. Amy carefully read Paltridge & Starfield's (2007) book and exclaimed in her third stimulated recall that if she had read the book earlier she would make better plans for her thesis and avoid many errors in her first draft. She continuously used the book and other related literature as a guide to learn about the various scientific concepts such as the IMRAD structure, moves, metadiscourse for her thesis and to revise every chapter. For instance,

My supervisor discussed Swales' CARS model before when analyzing research articles. When I read this book, I suddenly realized the CARS model is also meaningful to my introductory chapter. I only introduced the research background and the research gap, which matches *Move I Establishing a research territory* and *Move II Establishing a niche* respectively. *Move III Occupying the niche* was missing in my thesis. (Amy's third stimulated recall)

Amy then added research purpose, research questions, and the structure of the thesis to the chapter to formulate a complete CARS model in her thesis. As she learned more knowledge about the reliability and validity of research and rhetorical purpose of thesis writing, she revised her data collection as follows:

I gave more details about the participants, the scales used in the study, and how I analyzed the interview data; I also added a flowchart of the complete teaching procedure and a flowchart of the whole research procedures. If you didn't give enough details, the reader will doubt the reliability and validity of your study. You should think from the reader's perspective what appeals to him most. (Amy's third stimulated recall)

Later she redesigned the tables to present her data in a more concise way and used boxplot to present the differences between the two groups and between the pretest and the posttest so that "the reader can understand my meanings more easily". Ivy read literature about her research topic to understand the many scientific concepts and their relationship such as shell nouns, anaphoric nouns, metadiscursive nouns, the interactive and interactional functions, and stance so that she could review literature more comprehensively as requested. As she recalled:

When I revised my draft, I always put the seminal books and journal articles at my hand.... I tried to categorize them and figure out how they are related. (Ivy's second stimulated recall)

As she revised literature and gained more insights into literature review, Ivy also revised her discussion chapter by comparing her findings with those reviewed in literature and discussed specifically the inconsistency between them.

The participants were also found to frequently depend on themselves to search for and read literature in discipline. Amy particularly felt frustrated:

Multimodal metaphor was a new topic to my supervisor and to me and I had to search for literature by myself. ...There is a lot of English literature on metaphor, multimodality, multimodal teaching, multimodal metaphor, metaphorical competence and I was overwhelmed by them. Sometimes reading one piece led to more questions than solutions; at other times the one I read turned out to be useless. ...Carefully reading one piece cost a lot of time because I was not skillful at academic writing and not familiar with the research field. I was also not sure whether my understanding was correct or not. (Amy's second stimulated recall)

Amy read Chinese literature to facilitate her understanding of English literature and also cited many Chinese scholars' works; yet her reliance on Chinese literature caused other issues in her thesis writing. For instance, she attributed the numerous linguistic and rhetorical errors in her first draft to her unidiomatic translation from Chinese and lack of reading L2 literature; her literature review was considered to be not "comprehensive enough" (her supervisor's comments) as her literature in the recent five years was dominated by research published in Chinese and she seemed to overlook the recent development in the international academia. During the revision process she had to spend much time correcting errors, revising paragraphs, and adding the recent English literature. On reflection, she said,

I should read more English literature, which is more useful to writing an English thesis. Chinese literature can be used as a supplement, but not as a replacement for English thesis writing. (Amy's second interview)

While she generally used English literature throughout her writing process, Ivy felt her sense making of it was still not insightful enough:

An examiner suggested that when reading literature, one needs to first crack down the references and then synthesize them logically in her own study. ...My reading is still too brief and may be adequate for a Master's thesis, but not critical enough for a research paper. (Ivy's fourth stimulated recall)

In the second interview, Ivy also said she would do more intensive reading of the literature to produce a more insightful literature review and hopefully publish a research paper from it.

5.3 Making sense of their own meanings

Although making sense of expert others' meanings empowered them with rich sociocultural resources for the internalization of genre knowledge, the participants' thesis writing was not simply "their meanings." They were also found to make sense of their own meanings as they wrote and repeatedly revised their drafts. For instance, after she realized it was necessary to compare studies on shell nouns across genres in detail, Ivy revised her passage as mentioned above. Here is the first paragraph she wrote for this section in the second draft:

Research on shell nouns has mainly been conducted in academic writing and frequently examined genres are journal articles and argumentative essays. Jiang & Hyland (2015, 2016, 2017) compared shell noun use in research articles and article abstracts from both soft and hard science disciplines (e.g. applied linguistics, marketing, sociology, electrical engineering, medicine, and biology) and found that soft science writers tend to use shell nouns more frequently than hard science writers, mainly owing to the different research practice and knowledge construction in disciplines (Jiang & Hyland, 2016, 2017). Research on argumentative essays reveals L2 students often fail to effectively use shell nouns to construct their stance and make many errors (Flowerdew, 2006; Jiang, 2015). Jiang (2015) found that compared with their L1 counterparts, L2 students used significantly fewer event shell nouns, indicating their weaker ability to present facts, propositions and standpoints to their advantage when building their argument and gaining claim plausibility. L2 students were also more inclined to demonstrate their attitudinal feeling through pre-modifications to shell nouns although personal affect is not typical and impersonal argumentation is generally favored in such a genre (Jiang, 2015). Flowerdew (2015) examined Cantonese L1 learners' English argumentative essays and found that the average frequency of shell noun use and its errors per essay correlate significantly with grades awarded to the essays. Flowerdew (2015) also argues that shell noun use "adds to the overall coherence of a text" (p. 345), which probably explains the correlation between shell noun use and grades.

Fig. 1. Screenshot of Ivy's second draft p. 8

To compose this paragraph, she first read literature and found that shell nouns were often examined in two genres: journal articles and argumentative essays. She then reviewed the recent seminal works in the two genres and used a topic sentence to develop the paragraph in a logical way. Using topic sentences to develop a paragraph was a strategy frequently employed by Ivy when she wrote the thesis. As she said, "topic sentences can help me crystalize the main ideas of the paragraph and keep my writing on the right track." (Ivy's third stimulated recall)

Amy was found to earnestly learn about academic writing, particularly its linguistic features and move-step structures of each chapter and then revised most paragraphs in her thesis. Take her changes to the opening paragraph of the abstract in the first and second drafts as an example.

First draft	Second draft
<p>Multimodal metaphor presents the essence of metaphor through the interaction between our senses and the environment. On the whole, the research of multimodal metaphor is still in the developing stage and the theory and research methods of this field should be further improved. In recent years, more and more teachers have incorporated multi-modal metaphors into language teachings, such as writing teaching and vocabulary teaching, and have made some achievements. However, existing empirical studies often focus on how metaphor teaching improves students' writing level and vocabulary level, and there has been little research on the effect of multimodal metaphor teaching on students' metaphorical competence. Therefore, this study aims to fill this gap and explore the influence of multi-modal metaphor teaching on different aspects of metaphorical competence.</p>	<p>This study examines high school students' development of metaphorical competence under multimodal metaphor teaching condition. Previous research shows that compared to traditional metaphor teaching, multimodal metaphor teaching can produce more effect on people's cognition and thinking mode through an array of artifacts such as photos, sound, music, and language. While researchers have applied multimodal metaphor teaching in L2 instruction, little research has specifically explored the influence of multimodal metaphor teaching on students' metaphorical competence. Moreover, the new National English Curriculum for Senior High Schools attaches more importance to high school students' learning of rhetorics and creativity through multimodal resources. Thus, this study aims to fill in the gap and contributes to the teaching of multimodal metaphors in L2 classroom.</p>

Fig. 2. Opening paragraph of the abstract from Amy's thesis drafts

When describing her revision, Amy explained that as the opening paragraph of an abstract, it should provide an overview of the thesis, with the first sentence stating the purpose of the study and the rest sentences explaining reasons for the study. She also compared traditional and multimodal metaphor teaching rather than simply giving the definition and added more important information (i.e., the multimodal metaphor requirements of the new National English Curriculum for Senior High Schools). She read the paragraph many times and put linking words such as *moreover* and *thus* between sentences to make them logical and coherent. "Hope it looks clearer and more academic to the reader", she said. (Amy's second stimulated recall)

The participants were found to further internalize and construct their *znachenie slova* and systems of concepts as they made sense of their own meanings through writing. Take the concept "thesis writing" as an example, before composing the first draft, Amy briefly knew that it should include literature review, data collection & analysis, and conclusion and took it as "I had an idea and then wrote it up in one go, like what I did for term papers" (the second stimulated recall). By the end of her thesis writing, she described thesis writing as follow:

Every chapter has its typical structure, signposting, and linguistic features. The experiment should be first piloted to ensure its feasibility....Most importantly, writing a thesis needs reiterative revision under supervision. (Amy's second interview)

Likewise, Ivy thought of a Master's thesis as mainly using academic English to write about her own work in the first interview. In Interview II, she said:

Both contents and language are important to thesis writing. You need to read literature about your research topic comprehensively and critically and understand the research field thoroughly.... When you write, you need to be meticulous, follow the conventions in academic writing, and present the details of your results so that your reader can appreciate your study. (Ivy's second interview)

Their growth witnessed not only the successful completion of their research projects as scheduled, but also their successful job hunting. Amy found a high school teaching position and Ivy became a university teacher upon graduation.

6. Discussion

By examining two Master's students' thesis writing process, this study found that they mainly made sense of their teachers' meanings, of meanings in artifacts, and of their own meanings as they learned about genre knowledge and developed from the intermental plane to the intramental plane. Among these three processes, making sense of their teachers' meanings seems to be influential to almost every important decision they made from choosing the research topics to reiteratively revising the drafts. Additionally it inspired the participants to make sense of meanings in literature and their own meanings, as reflected in their consistent taking of teachers' suggestions to read more literature and think over their ideas and expressions. This supports the findings that supervisory teams, as gate keepers and coaches of students' thesis writing activities and more experienced researchers, can often

empower students with confidence, motives, and strategies to cope with thesis writing (Casanave, 2010; Ma, 2019; Tardy, 2009, 2012). Making sense of meanings in literature also assisted the participants' making sense of their own meanings and teachers' meanings; by making sense of their own meanings, students further internalized and externalized their *znachenie slova* and systems of scientific concepts, and then received more expert others' assistance through revision, beginning a new cycle. While these three processes are presented separately, they seem to be intricately interwoven and together contribute to the participants' development of the speaking/thinking system, including structuring and restructuring of their *znachenie slova* and systems of concepts. This recursive progression lends support to Gallimore & Tharp's (1990) four stages of the ZPD, namely expert others' mediation, self mediation, internalization, and recursion. As they made sense of expert others' meanings and their own meanings recursively, they expanded their ZPD of thesis writing and developed themselves to be more skillful and experienced writers and researchers.

The findings also showed that while they could generally make sense of their teachers' meanings, making sense of meanings in literature posed more difficulties to them. As young novices who just began to participate in academia and lacked adequate expertise and experience in research areas and academic writing per se, they were like children who often needed adults' mediation for initial development in learning. Unlike contingent, content-rich, and tailor-made human mediation, literature seems to be more like the implicit conditions in Ohta's (2005) study, not providing enough developmental support while allowing learners to access data containing the target knowledge. When searching and reading literature alone, the participants might not have adequate genre knowledge to find the right literature or to notice the important information in it, or to appropriately understand its meanings and construct their systems of scientific concepts, or at least the scientific concepts in it were not salient enough for them to realize their importance. Making sense of their own meanings probably needed repeated revision, as demonstrated in their multi-drafts.

7. Conclusion and pedagogical implications

Drawing on Vygotsky's sociocultural approach to learning and development, this study examines how students develop their cognition from the intermental plane to the intramental plane in thesis writing and found that they mainly made sense of teachers' meanings, meanings in artifacts, and their own meanings in their development. In addition to its revelation of the social sources of development, the study advances the sociocultural approach to development by integrating Vygotsky's thinking/speaking system with the concept of ZPD and provides a new understanding of how students can expand their ZPD from expert others' mediation to self mediation and internalization in thesis writing. By making sense of sociocultural meanings and their own meanings in thesis writing, students were found to develop their *znachenie slova* and systems of concepts in their thinking/speaking system, thus expanding their ZPD. While students can adequately make sense of teachers' meanings, they were confronted with difficulties in making sense of literature. Factors such as prior learning, revision, and agency have been found to significantly influence students' making sense of meanings.

Pedagogical implications can be drawn from the findings of this study. First, literature-based interactions with supervisors, more experienced others, and peers should be strongly encouraged for novice researchers like the Master's students in this study. While their lack of genre knowledge and the tremendous demands of composing "the longest and most challenging piece of assessed writing" (Thompson, 2013, p. 284) for most graduate students have been revealed in previous research (Bitchener & Basturkmen, 2006; Maher & Milligan, 2019), their difficulties in making sense of literature and how it can be improved has seldom been specifically discussed. Additionally, as highlighted in this study and previous research (Aljaafreh & Lantolf, 1994; Casanave, 2010; de Guerrero & Villamil, 2000; Ma, 2019; Mochizuki, 2019; Tardy, 2009; L. Yu, 2020; S. Yu, 2019), interactions with supervisors, tutors, instructors, and peers can play a pivotal role in their learning and development. Thus if they are offered more opportunities to study literature with these people, students probably can better understand, interpret, and evaluate literature, construct a more comprehensive and critical system of concepts in their mind and make better use of it in their thesis writing. Second, as demonstrated in the study, learning the important scientific concepts in thesis genre (e.g., move-step structures, topic sentences, coherence, logic, and subject-matter concepts) is the key to their development. Thus concept-based language instruction is recommended for thesis writing instruction, which features a meaning-based, concept learning-oriented, and expert mediating approach to language instruction (Lantolf, Xi, & Minakova, 2020). Finally, revision is likely to be the site where supervisors can offer graduated, contingent, and tailor-made supervision; students can have plenty of hands-on opportunity to enhance their genre knowledge; and the drafts can offer unique resources for students to make new senses and room for improvement despite the various linguistic, rhetorical, and subject-matter errors in them. Thus supervisor-leading revision should be strongly encouraged in handling such a demanding task as thesis writing.

It should also be noted that the study examined only two participants and one discipline and its findings may not be generalized to other contexts. Learners from other contexts may find other resources whose meanings particularly meaningful to make sense of. For instance, students' disciplinary participation in academia was seldom mentioned in this study; however, it has been documented to be useful in other studies (Tardy, 2012) and future studies can examine how students develop from the intermental to intramental planes by making sense of its meaning.

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Appendix A: Questions for Interview I:

1. Could you please talk about your education background?
2. Why do you want to become an MA student?
3. What did you learn from your postgraduate study?
4. Please summarize some of the major writing genres you have worked with before you began working on your thesis.
5. What sorts of feedback did you receive from your professors on your course papers? What is the nature of this feedback? How did you incorporate this feedback? Can you give two examples?
6. How did you decide on your research topic?
7. Describe the kinds of reading practices involved in your research proposal.
8. How did you compose your research proposal?
9. What do you plan to do for your thesis?
10. What is your understanding of thesis writing?

Appendix B: Questions for keeping process logs

1. What did you write today, for example making an outline, searching for the literature, thinking about the central idea, writing or revising the draft? Be specific.
2. What resources did you use for learning and writing today?
3. Did you encounter any problems in your learning today? If yes, how did you overcome the problems?
4. Is the part that you wrote today difficult or easy for you?
5. Did you discuss with anyone else about your writing? If so, what did you talk about?

Appendix C: Questions for Interview II

1. What is your understanding of thesis writing?
2. Please summarize the revision you made in each chapter between your first and last drafts? Why did you make such revisions.

3. What are the most important resources mediating your thesis writing and revision?
4. What is the role of your L1 from your preparation for your thesis to the end of your thesis writing?
5. What are some of the scholarly changes you have seen in your identity as an MA student?
6. What was the most challenging aspect of writing a thesis in a L2? What was the most rewarding aspect of writing your thesis in a L2?
7. If you were to write a new thesis, what would you do?

Acknowledgments:

This study is supported by Guangzhou Municipal Philosophy and Social Sciences Development Fund during the 14th Five-Year Plan Period (2024GZGJ13).