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An Investigation of Factors Predicting Academic Writing Difficulties Among First-Year Doctoral Students

Iman Ibrahim Khudhair
University of Central Florida

AN INVESTIGATION OF FACTORS PREDICTING ACADEMIC WRITING DIFFICULTIES AMONG FIRST-YEAR DOCTORAL STUDENTS

by

IMAN IBRAHIM KHUDHAIR
B.A. University of Mosul at Mosul, 2006
M.A. University of Mosul at Mosul, 2009

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Major Professor: David N. Boote

ABSTRACT

This exploratory study investigated the variables that predict academic writing difficulties (AWDs) among first-year doctoral students, international and domestic, at a large, publicly funded research university in Southeastern United States. Data were collected through an online survey. The final sample size contained 111 first year students, domestic and international from various doctoral programs. The first analysis examined factors predicting first-year doctoral students' self-assessed writing difficulties, using Multiple Linear Regression. Five factors were statistically significant predictors of AWDs: Asian race, Colleges of Business, Engineering, and Science, and the age between fifty-five to sixty-four. The remaining factors associated with age, Race, or College were not statistically significant. The second analysis examined differences between domestic and international students using Multivariate analysis of variance (MANOVA) and Multivariate analysis of covariance (MANCOVA). The MANOVA results indicated statistically significant differences in the AWD and GRE writing scores between domestic and international students, but no statistically significant difference was found between the two groups for Motivation. However, when GRE writing scores were used as a covariate, the MANCOVA revealed statistically significant differences for both Motivation and AWD between international and domestic doctoral students. The findings of this study have important pedagogical implications for doctoral students, graduate faculty, curriculum designers, university's administrators, and universities writing support programs.

Keywords: *academic writing, academic writing difficulties, doctoral students, first-year, international students, domestic students, motivation, Graduate Record Examination.*

Dedicated to

My lovely mother, Hanaa, beautiful sister, Hanan, late father and sister, and my adorable family

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CHAPTER ONE: INTORDUCTION

Second Language Writing (SLW) has emerged as a separate field from Literacy in the late part of the twentieth century, when it evolved from providing pattern writing guidance for second language (L2) learners to research about L2 writers' identities and opinions in the writing process targeting certain audience to accomplish a communicative goal (Liontas, DelliCarpini, Anderson, Belcher, & Hirvela, 2018). Until the 1970s, research was scarce about how writing skills develop. Most researchers presumed that the writing process involved three simple steps: deciding in advance on what to write, working alone on writing, and expecting a composition instructor to assess the final writing product. However, this view has changed considerably during later decades toward understanding the cognitive process of writing, the sociocultural and linguistic variables that contribute to it, and the pedagogy of teaching writing to students in different contexts effectively (Gillespie, 2001). One important aspect of Teaching English to Speakers of Other Languages (TESOL) and SLW that attracted the attention of recent research is academic writing (AW) (Al Badi, 2015). More specifically, the issue of academic writing difficulties (AWDs) has become a research focus in TESOL and SLW due to the increasing number of international students in English as a Second Language (ESL) and English as a Foreign Language (EFL) settings, and the multiple writing challenges, academic, cognitive and cultural, (Scarcella, Olson, & Matuchniak, 2018).

In addition, it appears that AW is as difficult for domestic students as it is for their international counterparts since domestic students are not sufficiently prepared to meet the requirements of AW in graduate level courses (Findlay, 2018). Prior research has revealed that the composition courses offered in most US schools and community colleges are not sufficient to

improve the writing skills of domestic undergraduates to meet the graduate level demands where the assignments get more complicated compared to the undergraduate level (Findlay, 2018).

Investigating AWDs has been and still is a popular topic and a fertile ground for more research by Second Language Acquisition (SLA) scholars due to its importance for students who face many challenges while writing extensive academic pieces, such as theses, dissertations, and academic articles (Gurel, 2010; Wells, & Söderlund, 2018). However, learning AW is not as easy as it may seem since it requires not only highly-developed English language proficiency skills, which are different and far complicated than those used in the other three communication skills, listening, speaking, and reading, but also the ability to organize several cognitive processes (Fazel, & Ahmadi, 2011). As such, most recent literature has focused on AWDs among undergraduate and graduate international students pursuing their degrees in ESL or EFL contexts (Al Morshedi, 2011, Campion, 2016, Huang, 2010, Son & Park, 2014). Some of these studies have addressed graduate students' perceptions, experiences, and attitudes towards writing difficulties in certain genres, such as dissertation and project paper writing (Abdullah, Chan, & Suraya, 2015; Gurel, 2010), while others have discussed the adjustments students, faculty, and university administration had in order to address other linguistic and cultural writing challenges (Al Murshidi, 2014; Andrade, 2006).

However, none of this research addressed factors that predict AWDs for both international and domestic students pursuing their doctoral degrees in various fields simultaneously at an ESL setting, nor tried to compare both populations in relation to those factors. Moreover, most of these studies have used qualitative methodologies focusing on small samples whose results are difficult to generalize to larger contexts. This study, on the other hand, employed two research designs, correlational and causal-comparative, and accordingly utilized multiple quantitative data analysis

methods, that is Multiple Linear Regression (MLR), Multivariate analysis of variance (MANOVA), and Multivariate analysis of covariance (MANCOVA). The purpose of this study was to understand the factors that predict AWDs among first-year doctoral students.

Background and Rationale

Pursuing a doctoral degree in an ESL setting requires students to pass English proficiency tests, such as International English Language Testing System (IELTS) and Test of English as a Foreign Language (TOEFL) tests, as well as to be fully prepared for academic writing tasks, requirements, and expectations of the program (Paltridge, 2018). So how can doctoral students improve their writing to meet the high demands and expectations of their programs?

For the purpose of this research, the AW research overview in English is divided into four strands. One strand of research addressed the process of AW (Baily, 2015). A second strand investigated writing challenges undergraduate/ graduate international students face and the strategies they follow to overcome those challenges in ESL/EFL contexts (Al Murshidi, 2014; Campion, 2016; Imani & Habil, 2012; Paltridge, 2018; Ravichandran, Kretovics, Kirby, & Ghosh, 2017; Son & Pack, 2014). A third strand concentrated on the writing tasks or genres such as thesis/ dissertation or project paper writing (Bazerman, Applebee, Berninger, Brandt, Graham, Jeffery, & Campbell, 2018, Hyland, 2003; Swales, & Feak, 2009; Swales, & Feak, 2011). A fourth strand looked at the perceptions of faculty/ students, disciplinary writing, and teaching strategies in relation to academic writing, (Aitchison & Lee, 2006; Brooks-Gillies, Garcia, Kim, Manthey, & Smith, 2015; Busl, Donnelly, & Capdevielle, 2015; Douglas, 2015; Pessoa, Mitchell, & Miller, 2017). Taken together, these four strands of AW research have presented a much deeper

understanding of the challenges related to several facets of AW and some instructional practices that are likely to enhance learning AW.

However, most of this research have been qualitative. Chapter 2 indicated little quantitative research on the factors that predict AWDs among first year doctoral students. Therefore, the quantitative focus for this research was directed towards identifying those influential factors in order to improve the university-wide writing services provided for first-year doctoral students, both international and domestic. As such, this study contributed to both research and practice.

Statement of the Problem

AW is the cornerstone of graduate and undergraduate education that all students, whether international or domestic, should master if they want to attain a university degree (Al Badi, 2015). Teaching AW to L2 writers has become a critical case to study in the last two decades due to the increasing numbers of graduate students, international and domestic, at the universities in the United States, United Kingdom, Australia, and Canada.

A quick examination of previous studies on this topic shows that AWDs of international graduate students usually receive greater attention compared to those faced by domestic students (Al Murshidi, 2014; Campion, 2016; Imani & Habil, 2012; Paltridge, 2018; Ravichandran et al., 2017; Son & Pack, 2014). However, prior research has also shown that domestic students are as inadequately prepared for the writing demands of graduate school and to contribute to higher education as their international counterparts do due to different reasons, such as: a) the tedious taken-for-granted practices and policies in the higher education of the United States, b) the generality of the mandatory composition classes students took during the undergraduate level, and c) students' overuse of jargon in their writing (Brown, 2017; Findlay, 2018; Kamler, & Thomson,

2008; McAlpine, & Amundsen, 2011). All these issues are pertinent to domestic graduate students and are under-investigated and ignored in prior research.

In addition, most of those studies have investigated one factor, such as *motivation* with one population, at a time in relation to either AW or AWDs, but none of them has examined multiple factors that predict those difficulties at the same time. Moreover, the variables that influence the self-assessed academic writing difficulties of first-year doctoral students, or the differences between domestic and international students with regard to the factors influencing their AWDs are still under researched area in SLW.

Purpose of the Study

The purpose of this study was to understand the factors that predict academic writing difficulties among first-year doctoral students.

Research Questions

Data were collected and analyzed to answer the following research questions:

1. Are motivation for academic writing, college of study, GRE writing scores, gender, race, and age statistically significant predictors of self-reported academic writing difficulties among first-year doctoral students at a large, public University in the Southeastern United States?
    a. How much of the variance in self-reported writing difficulties is explained by motivation for academic writing, College of study, GRE writing scores, gender, race, and age?
2. Are there statistically significant differences between international and domestic students in their levels of motivation for academic writing, self-reported writing difficulties, and GRE writing scores?

Research Design

To answer the research questions, this study used two research designs. Data were collected from a single survey but analyzed in two ways. For the first research question, a correlational research design was utilized to identify the variable(s) that best predict writing challenges for first-year international and domestic doctoral students. For the second research question, a causal-comparative research design was used to understand the differences in the factors predicting the AWDs between international and domestic doctoral students. For the first part of the study, self-assessed writing difficulties was the dependent variable, and the following factors were used as independent variables: motivation, field of study, GRE writing scores, gender, age, and race. For the second part of the study, motivation, AWD, and GRE writing scores were the dependent variables, with the demographic variable of international or domestic as the independent variable.

Data was collected via an online Qualtrics survey which was distributed to both international and domestic first-year doctoral students at a large-research university in the Southeastern America. The survey, which included two adapted scales from previously published instruments, consisted of four scales; Academic Writing Difficulties (Gurel, 2010), Motivation (Naderi, Wechsung, Polzehl, & Möller, 2014), GRE writing scores, and a demographic questionnaire. Since the study used a quantitative approach for analysis of the research questions, MLR was used to analyze data obtained for research question one and its sub question, while MANOVA and MANCOVA were used to analyze data obtained for research question two.

Importance of the Study

This study has contributed to the current body of knowledge by increasing the understanding of the various AWDs in an ESL setting, specifically those among first- year doctoral

students and the variables that may predict such difficulties. In addition, this study has the potential to be the first study that took the AWDs of doctoral students as its topic of study focusing on the factors that may predict those challenges during their first year in their doctoral programs, exploring possible relationships among the variables, and detecting the differences in the AWDs, motivation, and GRE writing scores if any, between first-year international doctoral students and their domestic counterparts. In this sense, the contribution of this study was important for current TESOL and SLW literature since its pedagogical implications specified the limited services writing centers provide for doctoral students who assume that doctoral students already have high proficiency in English language literacy that they do not need any writing assistance. The findings of this study also yielded important information for faculty and administrative staff in various doctoral programs about those students' writing proficiency in order to modify first -year curricula to meet their needs on the one hand, and their fields' requirements and expectations on the other hand. Moreover, the results of this study were particularly important for universities, and university writing centers because the findings provided a clear picture about first-year doctoral students' writing skills leading those facilities to design and tailor academic writing workshops to address students' writing challenges.

Definitions of Major Terms

Since the following acronyms and terms appear frequently throughout the dissertation, and to better understand the study, the definitions of the terms are provided below.

- Academic writing (AW): refers to the prestigious writing style that is used in scientific research to address a specific topic in a field (Hartley, 2008).

- Academic Writing Difficulties (AWDs): the challenges that international and domestic students face while writing their academic tasks during their first year in doctoral programs.
- Cognitive Evaluation Theory (CET): It is a sub-theory within SDT that aims at identifying factors that can explain intrinsic motivation variability (Deci & Ryan, 1985).
- Domestic Students: are citizens or lawful permanent residents of the United States, who are enrolled and studying at an accredited higher education institution in the U.S.
- Graduate Record Examination (GRE): In this study, only GRE writing scores will be used.
- International English Language Testing System (IELTS)
- International students: are individuals who are enrolled for credit at an accredited higher education institution in the U.S. on a temporary visa (Andrade, 2006).
- English as a Foreign Language (EFL): refers to language education for learners who are learning English in a country where English is not the dominant or native language.
- English as a Second Language (ESL): refers to language education for learners who are learning English in a country where English is the dominant or native language.
- Extrinsic Motivation (EM): a sub type of Self-Determination Theory (SDT), which is related to using external rewards to motivate people.
- First language (L1): is the native language of the individual, which was acquired from birth.
- Intrinsic Motivation (IM): a sub type of Self-Determination Theory (SDT), which refers to the inherent tendency to complete a specific task or activity for the purpose of self-satisfaction and enjoyment.
- Extrinsic and Intrinsic Motivation Scale (EIMS): is a motivation scale used by (Naderi et al., 2014) aimed to measure work motivation type in various work environments.

- Multiple Linear Regression (MLR)
- Multivariate Analysis of Variance (MANOVA)
- Multivariate Analysis of Covariance (MANCOVA)
- Motivation: This term is used in this study to refer to the intrinsic and extrinsic motivations of students that may help or hinder improving their academic writing in order to complete a doctoral program.
- Organismic Integration Theory (OIT): A sub theory within SDT that explains various kinds of motivation organized in terms of the degree to the self –autonomy (Deci & Ryan, 1985).
- Race: this term is used in this study to refer to the eight main races that the United States Census Bureau identified "White, Black or African American, Asian, American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander." For the sake of this study, "Middle Eastern" was added as an option for "Race" because of its educational importance in doctoral education.
- Second Language Acquisition (SLA)
- Second Language Writing (SLW)
- Second language (L2): is the new language that has been learned some time after acquiring the first language.
- Self-Determination Theory (SDT): A major psychological motivation theory that has two major types, intrinsic motivation and extrinsic motivation (Deci & Ryan, 1985).
- Teaching English to Speakers of Other Languages (TESOL)
- Test of English as a Foreign Language (TOEFL)
- Multiple Imputation (MI)

CHAPTER TWO: LITERATURE REVIEW

In this literature review, prior research on AW/AWDs in relation to other different concepts was reviewed. Some of those concepts, such as motivation and GRE writing scores, are hypothesized to be factors that predict AWDs encountered by first year doctoral students in their graduate fields. The focus on investigating AWDs among first year doctoral students, both international and domestic, provides an important insight because when these students are admitted into a doctoral program, they are expected to write according to certain standards. Yet, they struggle all the time, whether they took previous English writing courses or not, since they are inadequately prepared to meet their program's expectations and writing genres. In addition, a few studies have examined AWDs among doctoral students in general, but none addressed first-year doctoral, domestic and international, students in particular. Therefore, this study aimed to explore those populations writing issues, and identify the most crucial factors that predict their AWDs.

Writing as a Skill

Learning a new language is a journey that includes enjoyment, excitement and difficulty. Learners seek to learn all the aspects of the language mainly by attending schools that provide formal education or through communication with friends and peers. English language has four, skills, arranged according to difficulty from the lowest to highest: listening, speaking, reading and writing. Much research has been devoted to address reading and writing (literacy skills) than listening and speaking due to the complexity of the former skills than the latter ones (Ferris, 2009). Mihai & Purmensky (2016) defined writing as "a productive skill that allows the language learner to communicate ideas using language represented through graphic symbols" (p.199). In fact, writing is the hardest skill to learn especially for second language learners as they: a) always

struggle with learning a new language and academic writing development, b) had limited exposure to academic written texts, and c) lack experience in the L2 writing (Ferris, 2009). Therefore, L2 writers need to learn *micro* and *macro* skills that are critical for writing. While *micro skills* refer to the basic foundations of writing such as words, phrases, and sentences, *macro skills* focus on writing aspects like the purpose of writing, audience, and meaning of the text being written (Mihai & Purmensky, 2016) (Please refer to the main source for the tables of micro and macro skills in writing).

Ample research has shown that young and adult learners face difficulties in one or more of the four writing levels: imitative, intensive, responsive, and responsive extensive (Brown & Abeywickrama, 2010). *Imitative writing* includes the basics of writing such as writing letters, words, and punctuation marks. Although it is assumed that English language learners know the fundamentals of a language, many of them showed a lack of basic training and needed an immediate assessment of the imitative writing. *Intensive or controlled writing* is the next level of writing in which learners use language to display their ideas through vocabulary, grammar, and sentence patterns, but it does not necessarily include authentic meaning. Instances of intensive writing include using reduced forms and combining two sentences into one via a relative pronoun. *Responsive writing*, on the other hand, reflects the creative writing responses of students within assessment settings. This kind of writing is more complex than the imitative and intensive writing as it includes some aspects and characteristics, such as using AW conventions and using transitions to connect two or more paragraphs together. Examples of this kind include writing short reports and responses to discussions of other students. *Responsive extensive writing* is the fourth level of writing that represents wide variety of writing tasks that range from writing small essays to full

articles and book reviews (Brown & Abeywickrama, 2010). Thus, the higher the level of the writing, the more complex it becomes and the more problems L2 writers face in writing.

Although it has been assumed that both L1 and L2 writers use similar writing steps of brainstorming, creating a draft, selecting suitable vocabulary, etc., there are also radical differences among the linguistic systems of languages and writing conventions which compound writing complexity for L2 writers (Mihai & Purmensky, 2016). In addition, L1 writers have fully acquired the language owning a developed linguistic system at their disposal when they write, and they are familiar with certain formulaic sequences that makes written texts run smoothly and understandably (Ferris, 2009). On the contrast, L2 learners struggle in developing L2 vocabularies and rules and they are unacquainted with linguistic sequences which means wasting more time to search and use alternatives increasing their frustration and amotivation (Pérez-Llantada, 2014).

The Nature of Academic Writing (AW) in ESL Setting

Academic writing refers to the prestigious writing style that is used in scientific research to address a specific topic in a field (Hartley, 2008). According to Akkaya and Aydin (2018), AW is a key point "of the academic research process through which scientists report situations of thinking, experience, observation, application / testing etc. as to the solution of a scientific problem identified" (129). Moreover, AW skill is considered as the most critical aspect of language proficiency to succeed in any academic field (Fazel, & Ahmadi, 2011). Although it is different from school to school, field to field, and even for one advisor to another (Bailey, 2014), most scholars in TESOL and SLW have consensus that AW has certain characteristics that distinguish it from other jargons used in everyday life such as, formal style, objectivity, complexity of ideas and language, topic abstraction, preciseness, (Scarcella et al., 2018).

The *formality* of AW is demonstrated in using specific grammatical features, such as single verbs instead of phrasal/prepositional ones, complex noun phrases to deliver succinct meaning, using passive voice rather than active voice, adverb mid-position, indirect questions to attract readers' attention, simple and complex sentences, etc. (Swales & Feak, 2012). In their corpus study, Hyland & Jiang (2017) investigated the influence of 10 key features of informality in the AW of four disciplines. The findings have revealed that AW in those fields has kept its formality and has not been influenced by the informality of everyday lifestyle. However, a distinction should be drawn between *academic writing* and *writing style* because these two terms should not be used interchangeably. While *academic writing*, or what Kemp (2007) named "Educational Writing", refers to academic writing that is predominantly used for the purpose of publication or at a setting with scholarly audience in postgraduate education, *writing style* refers to AW's measurable areas such as vocabulary, grammar, mechanical conventions (spelling, punctuation, and capitalization) through which we can identify AW in a certain field/discipline for a specific purpose/genera (Kemp, 2007). In this sense, writing style is a distinctive feature of AW that indicates its presence in any written genre. Another important feature of AW is *objectivity* which points to the unbiased, non-subjective presentation of facts and results of a research topic, experience, experiment, observation, or a test while writing. Given the objectivity of AW, the main focus is the research discussion rather than researcher's voice and opinion (Monippally & Pawar, 2010).

In terms AW's *complexity*, opinions differed. Some studies reported that a well academically written piece should include complex ideas (Scarcella et al., 2018), while other scholars claimed that AW has been stereotyped by the assumption of complexity since the spoken register (conversation) is far more complex than the written one as it involves many contextual elements (Biber & Gray, 2010). Other researchers relate the complexity of AW to the difficulty

students face through the process of writing that consists of several steps such as how to start, brainstorming an idea, writing multiple drafts, and then editing the final written product (Abdullah et al., 2015)

In addition to the noted features, Bailey (2014) identified the following five: the use of *citation* instead of references, *abbreviations* to save space, *italics* to show words that are borrowed from other languages and *brackets* to provide extra information or to clarify a point. Thus, generally speaking, any written product is considered *academic* in the Western universities if it includes as many as possible of the earlier characteristics.

Graduate Versus Undergraduate Academic Writing

Writing genres, requirements, and expectations differ considerably between graduate and undergraduate students. The increasing diversity in the undergraduate population in postsecondary US educational institutions attracted the attention of L2 writing scholars in the last three decades since those populations' bilingualism/multilingualism is pertinent to their literacy skills (Cummins, 1979; Findlay, 2018). Findlay (2018) argued that most undergraduate writing research has been conducted on international and generation 1.5 because their multi languages interfere with their AW creating many difficulties for them. Unfortunately, the composition courses offered in most US schools and community colleges are not sufficient enough to improve the writing skills of domestic undergraduates in general and international undergraduates in particular to meet the graduate level demands because the assignments, such as essays, research papers, and discussions, are easy and require basic writing skills compared to the graduate level (Findlay, 2018). Therefore, a huge change in identity happens to undergraduates when they enroll in graduate school where

they transfer from consumers of knowledge to producers in their fields due to the more complicated writing assignments which are required from them (Douglas, 2015). However, some scholars like Ravichandran et al. (2017) stated that "the impact of any shortcomings in English language writing skills is exacerbated among international graduate students as the writing expectations are much higher compared to undergraduate coursework" (p. 766).

With respect to graduate academic writing, Paltridge (2018) suggested that in addition to the high level of English proficiency they need to complete academic tasks assigned to them, graduate students also need to understand their field's requirements, expectations, kinds of genres, purposes, and audiences behind those genres. Douglas (2015) argued that even domestic graduate students encountered academic writing difficulties due to their unfamiliarity with their programs' expectations, the thing that is double complicated for international graduate students who come from a different academic culture where academic writing conventions are completely different from those in the hosting country (Al-Zubaidi, 2012). Although international graduate students may meet university's language proficiency and academic requirements, such as TOEFL and GRE tests, they are not fully prepared to meet the writing demands of a major program in a Western school where a well-developed writing skills in L2 are required if they want to compete with domestics (Monroe, 2018, Paltridge, 2018). The situation is more intricate if international students have not attended previously a university where English is the main medium of instruction, making it more difficult to understand the conventions and requirements of their field easily.

In the same context of distinguishing between graduate and undergraduate writings, Huang (2010) carried out a needs analysis study which aimed at assessing graduate and undergraduate students' learning needs through a new academic support center at a Canadian university. English language learners and faculty members were asked to provide importance ratings of academic

language skills through questionnaires and open-ended questions to assess their own or their students' writing skill status. The results indicated that there was an overlap between the answers of graduate instructors and those of the graduate students, and also between undergraduate instructors and undergraduate students' responses concerning the writing skill items specified as 'very important' to succeed in a course. In other words, while there was a relative agreements and differences between instructors and students' responses. The agreement suggested that students had a clear idea about the language skills that their instructors regarded significant for completing their degrees. However, responses of students' self-evaluations and instructors' assessments of their graduate and undergraduate students differed dramatically in terms of the perceived expectations and needs of students and those of their instructors. In addition, results from the self-assessment data revealed a teacher–learner gap which means that neither students, undergraduate and graduate, can not self-diagnose their difficulties academically nor instructors can be the best assessors of their students' challenges.

Academic Writing Difficulties for Students

Empirical studies have employed various research designs, testing instruments, contexts, and methodologies to investigate the issue of AWDs among graduate students in EFL/ESL settings, and the strategies or adjustments they used to overcome those challenges. This section presents most recent studies about AWDs within EFL/ESL environments.

AWDs in EFL Setting

With respect to AWDs in an *EFL* context, the literature included empirical studies that explored challenges of writing in different writing genres. In his mixed methods study, Gurel (2010) investigated the sociocultural and linguistic difficulties in the writing process of

dissertations in English as a Foreign Language, and the strategies employed to overcome those challenges among Turkish doctoral students in various engineering fields in Turkey. The difficulties were classified as attitudinal issues, cognitive issues, linguistic issues, and sociocultural issues. The two coping techniques students used to overcome the difficulties were written sources and faculty feedback on their drafts.

A similar cross-disciplinary study was conducted by Imani & Habil (2012) to identify strategies used by graduate non-native students to address difficulties associated with dissertation writing across three disciplines: Chemical Engineering (CE), Teaching English as a Second Language (TESL), and Construction Contract Management (CCM) at a Malaysian university. Difficulties were detected through three grammatical features: variety, complexity, and grammatical accuracy. The results revealed that coping strategies were pertinent to the study field, hence, CCM and CE students relied heavily on asking previous peers, avoiding difficult structures, and copying beneficial patterns, while TESL students referred more to advisor's feedback, peers' help, grammar books, online sources and learning new written patterns to overcome these grammatical obstacles. Al-Zubaidi (2012), on the other hand, focused on the reasons behind AWDs among Arab graduate students while studying at a Malaysian university and how to address them via teaching courses. The results have shown that those students faced writing challenges due to several factors, most important of them are the cultural difference, their low English proficiency because of deficiencies in their previous instruction, and their poor attitude towards learning new writing conventions. Therefore, the author has proposed to restructure the curricula to meet those students' needs and motivate them to perform better.

While the previous three studies focused on graduate international students, Abdullah et al. (2015) administrated a study to investigate the perceptions of Chinese undergraduate students

about AWDs during the process of writing a project paper in English at a Malaysian university. The findings indicated that students struggled with idea development, grammatical structures, and avoiding plagiarism. In addition, because those students lacked confidence and L2 writing skills, they relied heavily on their advisors help in deciding a topic and developing ideas.

AWDs in ESL Setting

Regarding the ESL context, prior research indicated that international students face more problems while pursuing their degrees compared to those in an EFL context due to other accompanying sociocultural challenges (Abdullah et al., 2015). For instance, Al Morshedi (2011) carried out a mixed- methods dissertation study that aimed to examine cultural and academic difficulties among Emirati and Saudi students at U.S. universities and the coping strategies they used to overcome them. Although the survey results indicated that students' gender and linguistic problems in English did not impact their classroom participation, the interviews showed that due to their low proficiency in English, students experienced literacy problems especially in writing. To overcome those challenges, Emirati and Saudi students visited writing centers regularly, attended writing preparation courses, and used dictionaries in order to improve their writing skills. Using the same dissertation sample, Al Murshidi conducted another mixed methods study in (2014) to explore AWDs faced by Emirati and Saudi students at various US universities and to determine their coping techniques. Her findings have revealed that less than 31% felt comfortable during academic writing in English a second language. A similar qualitative study, carried out by Ravichandran et al. (2017), sought to identify the AWDs among international graduate students in various disciplines at a US university and the strategies they used to deal with these challenges. Interview results revealed that idea flow, paragraph organization, plagiarism, critical thinking,

vocabulary, and grammar were the main issues students had with academic writing. Therefore, they used their faculty, peers, friends, and mentors' feedback to improve their English writing skills.

It is concluded from the studies mentioned above that the first academic difficulty international population encounter is their low proficiency skills in English which made them unwilling to improve their writing (Al-Zubaidi, 2012; Andrade, 2006). In addition, due to the unfamiliarity with the major's expectations, writing genres, and writing convections, international students experience more writing anxiety and seek feedback from their instructors, friends, and peers (Al-Zubaidi, 2012; Paltridge, 2018).

All the above discussion lead to the following question: do domestic students face similar AWDs as their international counterparts do? The answer is not clear-cut since studies on this issue presented different results. While many studies assumed that L2 writers face more AWDs than L1 writers attributing this to L2 writers' low proficiency skills in English (Jiang, 2015), other researchers conducted contrastive studies and refuted this assumption claiming that international students can produce well-written academic genres as those of domestic students and that AWDs were actually as common among domestic students as they were among their international counterparts. In fact, the body of the literature provides empirical studies that have employed either textual analysis or corpus-based design to compare certain aspects of AW between international and domestic students to support the second point of view. For example, Öztürk, & Köse, (2016) conducted a corpus-based study to examine the difference in use of lexical bundles in the field of foreign language teaching in the writing of native English students, native English scholars, and Turkish graduate students. The comparison was administrated based on the graduation theses and dissertations of Turkish students and scholarly published papers of native English students. The

results showed that Turkish graduate students used lexical bundles in their written text far more than native students and scholars did in their written articles suggesting less AWDs encountered compared to their native counterparts. Another mixed-methods corpus-based study compared the stance markers in the essays written by American students to those written by Turkish learners of English. The findings indicated that Turkish students used authorial presence markers in English essays in a similar way to those used by American students (Çandarl, Bayyurt, and Mart, 2015).

Factors That Predict AWDs

According to Scarcella et al. (2018), there are several factors that affect learning new aspects of AW, such as exposure time to L1 and L2, access to continuous literacy education and feedback, the use of L1 in reading and writing, attitude towards writing, and the features of linguistic development. The following sections present prior research about some of these factors that may predict AWDs among doctoral students, domestic and international.

Motivation

Main Theories of Motivation

Even though its importance, motivation is a complicated concept that has attracted extensive investigation in recent years due to its centrality in understanding human beings' behaviors to perform an activity in different fields. Given that significance, it is critical to know and distinguish the main theories of motivation and then talk about the specific theory this study will adopt in order to explain doctoral students' motivation to improve their academic writing to accomplish eventually success in their graduate programs. The Earliest motivation theories can be classified into two main types: ***Content theories*** and ***Process Theories***. *Content theories* focus on WHAT motivate(s) human behavior. They are also known as "needs theories" because they point

out to the needs of human beings and relate motivation to achieve these needs. While content theories proved to be most useful for management practice and policy environments, they were the least accepted within academic contexts. *Process theories*, on the other hand, are concerned with HOW behavior is caused, maintained or stopped by one or more motivational factors. These theories basically imply that individual choices are based on preferences, rewards, or sense of accomplishment. The predominant content theories are Maslow's Hierarchy of Needs, Alderfer's Existence, Relatedness and Growth (ERG) Theory, McClelland's Achievement Motivation, and Herzberg's Two-Factor Theory, while the main process theories are: Skinner's Reinforcement Theory, Vroom's Expectancy Theory, Adams' Equity Theory, and Locke's Goal Setting Theory (Partap, 2016) (see Figure 1). Both, content and process theories focus on factors that improve or fail to improve individuals' understanding of behavior-consequences and engaging in behaviors to achieve those outcomes, thus, making distinction between motivated vs. unmotivated behaviors (Deci, Vallerand, Pelletier & Ryan, 1991).

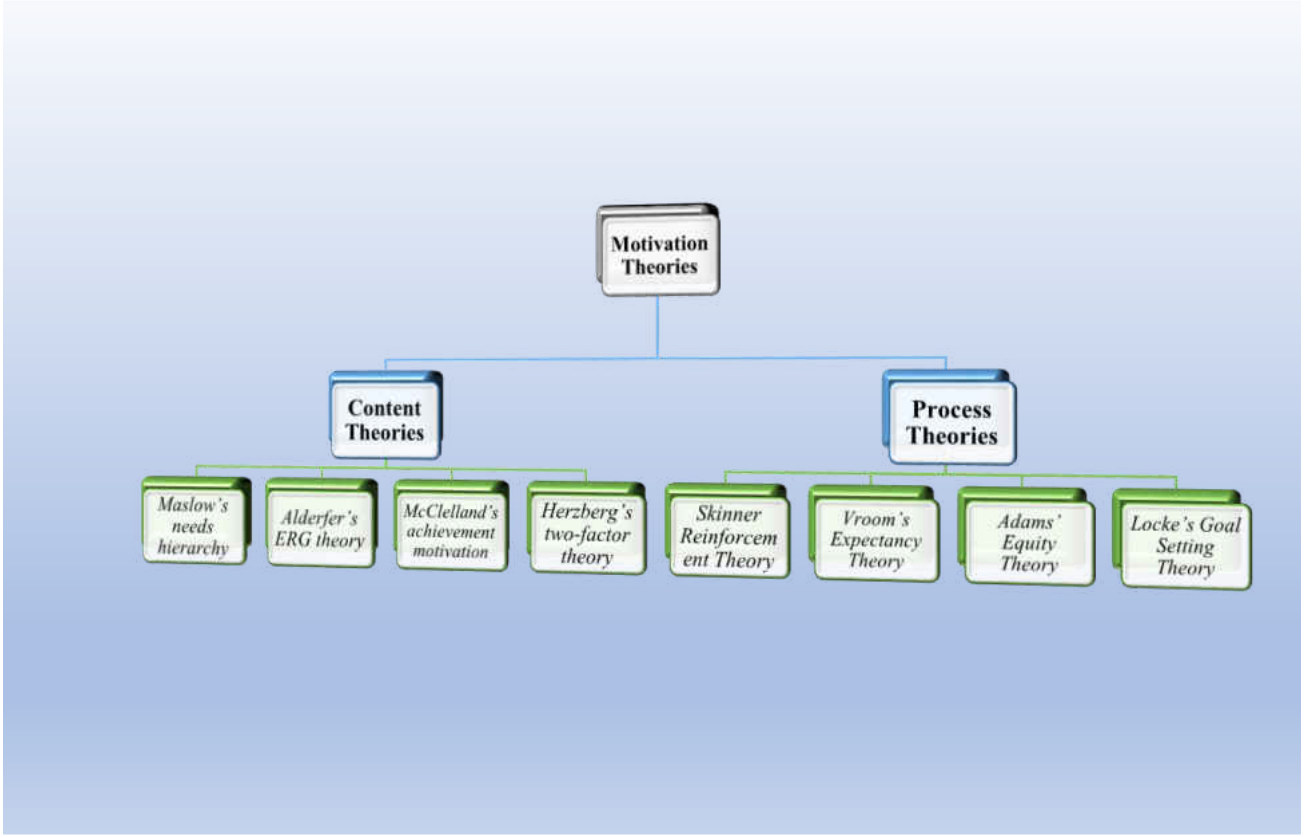


Figure 1: Main Theories of Motivation

Research on L2 motivation is also ample with theories and contributions from famous scholars, such as Zoltán Dörnyei, a famous scholar and psycholinguistics professor in the field of SLW motivation. His contribution, which started in the 1990s and became vast and influential in the 2000s, focused on motivation of English language learners and Applied Linguistics. Dörnyei wrote inspirational books about motivation and published many journal articles and book chapters that addressed L2 motivation since the 1990s. He also offered his motivation questionnaires for other scholars to use for free. However, none of his theories nor research instruments were used in this study since they do not apply for first-year doctoral domestic students easily.

Self-Determination Theory (SDT)

Although some of the classical theories mentioned above are useful in management and some academic settings, they are not applicable for the current study. Therefore, this study employed another major motivation theory, that is Self-Determination Theory (SDT). SDT has been developed by Edward L. Deci and Richard M. Ryan in 1985. This theory has been refined and elaborated by other scholars from many countries. Self-Determination Theory is an "approach to human motivation and personality that uses traditional empirical methods while employing an organismic metatheory that highlights the importance of humans evolved inner resources for personality development and behavioral self-regulation" (Ryan, & Deci, 2000, 68). This theory is based on the assumption that human being's intrinsic inclinations need to be supported in order for that person to behave in efficient and healthy ways. Most recent theories of motivation concentrated on outcomes or goals and on the methods that lead to these wanted outcomes (Bandura, 1977). The main goal of such theories is the processes that guide a certain behavior toward a desired outcome, but they did not address why a specific outcome is desired, thus failing to explain the issue of how a behavior is energized (Deci et al., 1991).

Unlike any other motivational theory, SDT does not only address the energization issue, but it also interprets the direction of a behavior based on the inherent psychological needs in human life. The three basic innate needs that SDT theory focuses on are: the needs for *autonomy* (i.e. self-determination), *relatedness*, and *competence.* Autonomy refers to the self-instructing and self-controlling of one's own behaviors; relatedness means developing strong and satisfying relationships with other people in a social milieu; and competence involves knowing how to achieve various internal and external goals and being influential in performing the required actions.

The importance of SDT stems from the fact that, when implemented in educational and learning realms, it addresses issues of promoting students' learning interest, education esteem, and self-confidence as far as their abilities are concerned. Such outcomes are indications of those students being intrinsically motivated, having educational values and regulatory processes internalized resulting in excellent learning outcome, enriched personal development, as well as better understanding of the learning activity (Deci et al., 1991; Ryan, & Deci, 2000). In addition, SDT makes an important distinction between two types of intentional or motivated behaviors, self-determined and controlled. According to Deci et al. (1991), actions are considered motivated and self-determined when a person is self- engaged in an intentional behavior, whereas controlled actions are those compelled by some interpersonal force. Thus, when a behavior is self-determined, the action process is a choice, but when it is controlled, the action process is a compliance.

SDT has been chosen to be the underlying theory for the motivation factor in this study due to a) its importance and successfulness in several L2 learning contexts (Deci et al., 1991), b) its useful and pre-validated instrument, Extrinsic and Intrinsic Motivation Scale (EIMS) (Naderi et al., 2014), that has been adapted to feed a scale in the final survey of this study.

Basically, SDT has two main components or types: *intrinsic* and *extrinsic* motivation, which came later to be known as autonomous vs. controlled motivation respectively (see figure2), and those two govern learners' study behavior and the settings that promote or hinder these regulations (Vansteenkiste, Lens, & Deci, 2006). So, what do *intrinsic motivation (IM)* and extrinsic *motivation (EM)* refer to? Are they similar, different, or related to each other? The answer to these questions is illustrated in the next sections. However, for the purposes of the current study and because an adapted EIMS was employed in the final survey version, more attention is paid to the types of extrinsic motivation than its intrinsic counterpart.

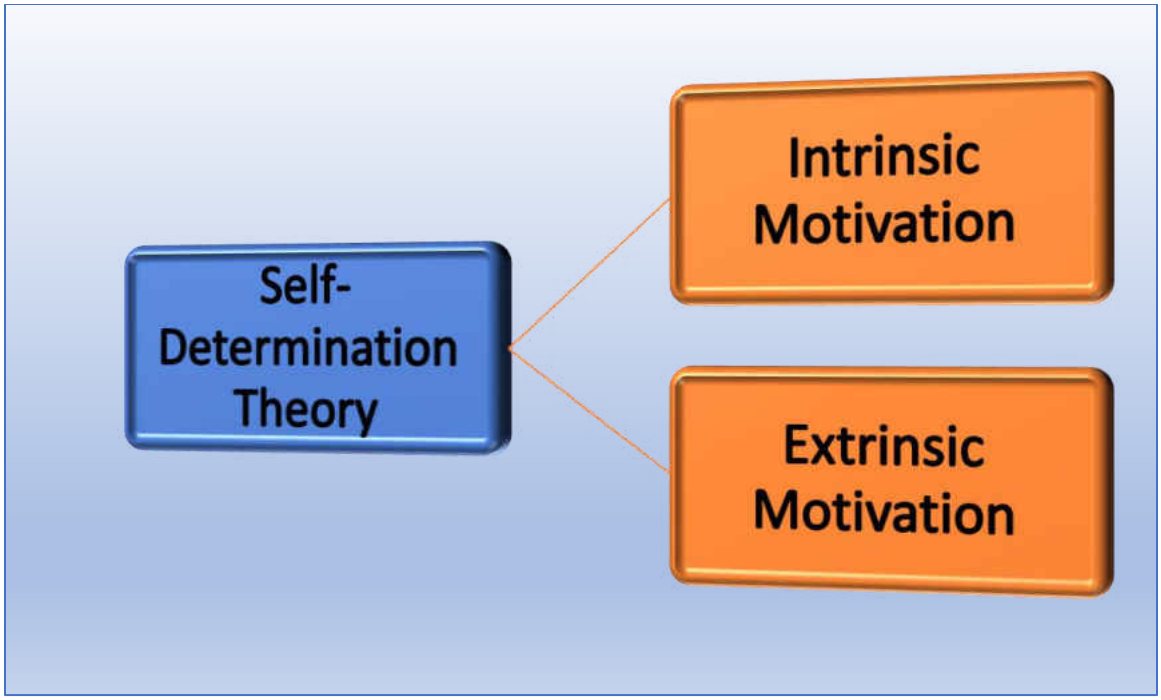


Figure 2. Self-Determination Theory of Motivation

Intrinsic Motivation (IM)

Intrinsic motivation refers to the positive natural tendency of a human being to assimilate, master, and have a spontaneous curiosity, that is very critical for social and cognitive development since it represents a main source of vitality and enjoyment. Although it is an inherent feature of human cognitive system, IM can be disrupted by many unsupportive factors. Therefore, Deci and Rayan's IM theory was concerned with the factors that facilitate or hinder IM more than what causes IM. Two important environmental constructs are closely related to IM, which are *autonomy* vs. *control* (Ryan, & Deci, 2000). The main idea behind IM is that a person is autonomous or independent during making a positive decision to involve in any activity, but having a variable, which may control that IM decision, will interrupt that innate positive propensity and threatens it. For this reason, research has revealed that any imposed extrinsic reward on an activity or

performance is considered as a form of control that can reduce autonomy and eventually undermine IM (Deci, Koestner, & Ryan, 1999).

Deci was the first scholar to introduce the term *Intrinsic Motivation* in his 1975 book *Intrinsic motivation*, but it was not considered officially related to SDT until (1985) when Deci and Ryan published their book, *Intrinsic motivation and self-determination in human behavior,* in which they presented to the world an explicated empirical evidence of the relevance between intrinsic motivation and self-determination theory. In their view or "organismic" opinion of motivation, they suggested that people are active processors instead of passive recipients of environmental forces. In addition, Deci and Ryan argued that intrinsic motivation and self-determination concepts are the confounds of many motivation theories that previous theorists and scholars reached to but could not really explain (Deci, & Ryan 1985).

Extrinsic Motivation (EM)

Although IM is an important inherent propensity that needs to be maintained, EM is equally substantial and critical especially since what most adults do is more extrinsically motivated than it is intrinsically (Rayan, & Deci, 2000). *Extrinsic Motivation* describes a performed behavior by a human being in order to achieve a wanted outcome, a reward, or to avoid a punishment (Nasihah, & Cahyono, 2017). In this sense, it is the opposite of intrinsic motivation, in which a specific activity is performed for the enjoyment and self- satisfaction. According to SDT, IM and EM correspond to autonomy vs. control concepts. For instance, the motives of writers who work hard to improve their written texts because they enjoy the writing process itself (IM) are totally different from those of students who want to improve their writing skills because they want to be recognized in their fields, earn money or respect of others (EM). In other words, EM has various degrees

depending on the type of internalized regulation and the extent of integration of a certain activity in one's self-choice. In addition, people do not only vary in levels (amounts) of motivation, but also, they differ in terms of orientations (types) of motivation. Motivation orientation means the causes, aims, and attitudes that underlie a given action. For instance, an employee can be highly motivated to work for interest and curiosity or, because he or she wants to attain the approval of an employer (Ryan, & Deci, 2000).

Organismic Integration Theory (OIT)

To explain EM kinds, its contextual variables, and to show further how it differs from IM, Deci and Ryan (1985) introduced a sub theory within SDT, known as Organismic Integration Theory (OIT). Figure 3 displays the OIT motivational taxonomy, organized from left to right in terms of the degree to the self -autonomy. Behaviors that are extrinsically motivated include the ones between amotivation, the far right, and intrinsic motivation, the far left, differing in the extent of their autonomous regulation. By contrast, intrinsic motivation holds the right of the continuum representing the full autonomy and enjoyment while performing an activity. The figure is adapted from Rayan and Deci (2000).

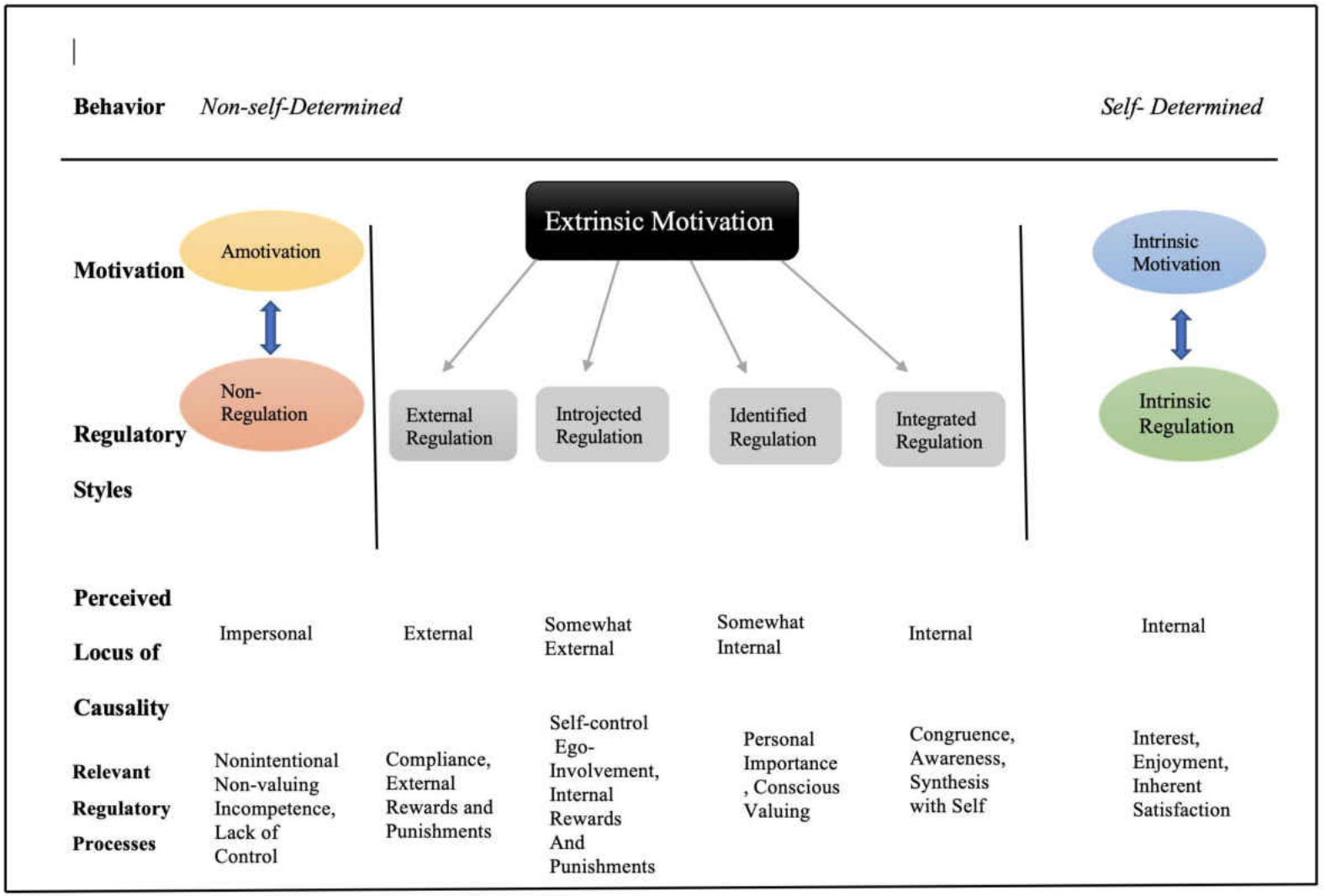


Figure 3.The Self-Determination Continuum Displaying Kinds of Motivation.

According to Ryan, & Deci (2000), research's empirical results of more than three decades have revealed that the nature of performance and experience are variant when a person is behaving for intrinsic versus extrinsic outcomes. IM has emerged as a critical phenomenon for educators to use for boosting students' achievement and learning. As IM leads to high-quality learning outcomes, it is particularly important to describe the variables and processes that enhance versus diminish them. SDT suggests that although there are impoverished kinds of EM, some are really useful in the classroom. For example, students can exhibit extrinsically motivated behaviors with displeasure, opposition, and carelessness or, alternatively, they can show an attitude of agreeableness, that expresses an inner approval of the utility or value of a task. Thus, understanding EM's various types and what endorses each one of them, is a significant issue for educators of all levels who may not always depend on IM to improve learning. Frankly, since many of the assignments and tasks that educators want their students to complete are not inherently enjoyable, such as writing, it becomes a more essential technique to know how to develop more interactive and volitional forms of EM for successful teaching and better student achievement (Ryan, & Deci, 2000).

Prior Research about Motivation

There are only several studies that have been conducted using SDT and its subtypes, IM and EM, in relation to students' academic writing which motivated this study more to add to the current literature and theory about how motivation can predict and at the same time improve academic writing of first-year doctoral students.

In ESL contexts, there is abundant research that needs a lot of space and time to explain. However, here are two representative articles. The first meta-analysis study, which can be considered as a synthesis of prior research, was carried out by Deci, Ryan, and Koestner (1999). Deci et al. (1999) investigated the effect of extrinsic rewards on IM in 128 studies. The results of their study revealed that similar to all types of tangible rewards, and expected rewards: a) engagement, performance, and completion rewards have significantly reduced IM, b) engagement, performance, and completion rewards have significantly diminished self-reported interest, c) positive feedback has improved both self-reported interest and free-choice behavior, and d) tangible rewards have been less harmful for college students than children, whereas verbal rewards were found to be more enhancing for college students than children. In the second study, Vansteenkiste et al. (2006) have examined the intrinsic vs. extrinsic goal framing of certain tasks under the contextual factors of autonomy vs. controlling by manipulating the instruction wording from an autonomy-supportive language, such as "can you…" to a more controlling-like language as in "you should…". The findings have indicated that self-choice-supportive language instructions led to better performance and learning than the controlling language instructions. That is, students with intrinsic goal framing developed deeper processing in the sense that their test free-choice persistence and performance were greater in the intrinsic- goal context than in those of the students with the extrinsic-goal context. Also, students who were exposed to the autonomy-supportive language showed increased deeper processing in the test performance, and persistence compared to their counterparts who were exposed to the controlling language.

The EFL context, on the other hand, has witnessed the publication of three articles addressing the correlation between motivation from the SDT perspective and academic writing of

students. The aim of Nasihah and Cahyono's (2017) study was to examine the relationship between a) language learning strategies and writing attainment, b) motivation and writing attainment, and c) language learning strategies with writing attainment and motivation of 100 senior high school EFL students in a large city in Indonesia. The results revealed that there was not only a significant correlation between motivation and writing attainment, but also a significant correlation between language learning strategies combined with motivation and writing attainment. In addition, it was found out that motivation and language learning strategies were significant predictors of writing attainment. With a similar purpose, but different sample and proficiency level, Nourinezhad, Shokrpour, and Shahsavar (2017) conducted a study trying to investigate the relationship between IM vs. EM and the L2 writing of 100 EFL medical students in Shiraz University of Medical Sciences, Iran, who took a compulsory 3-credit course of English for academic writing. Their findings showed that: a) the motivation of students influenced positively their writing, b) there was a significant relationship between students' intrinsic motivation and their writing scores, and c) the effects of intrinsic motivation on students' writing achievement were more than those of extrinsic motivation.

The research of Van Blankenstein, Saab, Van der Rijst, Danel, Bakker-van den Berg, and Van den Broek, (2018) aimed at assessing the opinions of 147 undergraduate students about IM and self-efficacy for some research activities while performing a research project. The results pointed out that there was a decrease in the IM, but a significant increase in self-efficacy attitudes towards research. Moreover, while self-efficacy was promoted by positive social mutual reliance and enactive proficiency, IM for writing was enhanced by feelings of relatedness. However, motivation stability for research might be attributed to autonomy lack and low-apprehended relevance.

To summarize, SDT with its sub theories and types focus on the issues of (a) transforming extrinsically motivated behaviors to intrinsically self-determined ones, and (b) the contextual variables that influences those behaviors, aiming, thus, to boost both students' learning experiences in various activities and educators' teaching methods to facilitate converting the different types of EM students have to an IM in that activity or task. Although both types of SDT are useful in educational settings, the evidence from prior research point out that IM is more beneficial in terms of prompting the capability to overcome learning challenges and improving one's educational skills (Rayan, & Deci, 2000a).

Although both, intrinsic and extrinsic motivation, are central for many researchers, this study employed only extrinsic motivation types which followed the Organismic Integration Theory (OIT), a sub theory of the SDT, and its instrument, Extrinsic and Intrinsic Motivation Scale (EIMS), to identify various types of motivation students had towards AW.

Field of Study (Disciplinary Writing)

In order to become a distinguished researcher in any academic field, a sophisticated coordination between learning and thinking is needed to contribute to the theory and practice of that field. Despite the appropriate AW skills some graduate students have, discipline-writing conventions are still vague and hard to understand for them due to the scarcity of AW training for graduate students (Douglas, 2015; Ross, Burgin, Aitchison, & Catterall, 2011). Therefore, it is important to familiarize graduate students with the AW in their fields by exploring the conventions and practices followed in their disciplines (Min, 2016). It should be noted here that for the purpose of this study, it was assumed that each College had Disciplinary similarities in terms of the writing style and conventions.

In addition, pursuing a Pd.D. degree in any field is a journey full of various educational and cultural experiences, especially for international students. Identity is one important aspect that is influenced by the different events during that journey, and particularly by Ph.D. field writing. According to Inouye & McAlpine (2019), "as identity development has been recognized as a key outcome of doctoral study; the PhD program is meant to transform students into independent researchers" (p. 1). Indeed, undergraduate students encounter fundamental identity changes as they transition to the graduate level since through their field writing, they turn from knowledge consumers to knowledge producers. However, they should learn their program's writing conventions, writing genres, and rhetorical patterns. For international students, these tasks are far more complicated due to the linguistic and cultural difficulties they face in a Western university (Douglas, 2015).

Field of Study and English for Academic Purposes (EAP) Courses

EAP courses are established to help international students bridge their linguistic gap and familiarize them with the academic conventions of western universities. Most of international students in those EAP programs have different graduate/undergraduate academic interests which requires, therefore, tailoring writing EAP courses for their needs to be as close in content as possible to their degree disciplines to ensure maximum benefit and high performance for them (Douglas, 2015; Paltridge, 2018). However, there has been discrepancies in the point view about the effectiveness and relatedness of such courses to the graduate field a student intends to study in. Some scholars claim that EAP courses can be useful as they analyze expert's writing samples providing thus rhetorical conventions, strategies, and comprehensive feedback on students' written draft. Moreover, EAP classes offer graduate students with a safe space where they can learn their

discipline's writing conventions under the supervision of language experts who work to increase student's writing confidence s (Douglas, 2015).

Other researchers think that what is happening in real life is quite different than what is expected from the practices of EAP programs as EAP educators are still teaching students one-size-fits-all writing classes assuming that those general writing skills are applicable to any assignment in any discipline, which is a myth. So, when graduate students try to transfer the writing skills, they have learned in the EAP program to their field writing, they are shocked by how far their writing is from the actual AW in their field. This is attributed to the poor planning of these EAP and poor administrational decisions (Min, 2016).

Disciplinary Writing Support

Another aspect that became the focus of much research recently is the strategies and polices that can be used to improve AW of doctoral students in various disciplines. A growing body of literature addresses the need for certain graduate writing support, such as discipline-specific writing courses or research writing groups (Douglas, 2015; Aitchison and Lee, 2006; Catterall, Ross, Aitchison, and Bergin, 2011; Ross et al., 2011).

Aitchison and Lee (2006) conducted a study to identify some problematic pedagogies and policies in research writing. In a try to solve or elevate those difficulties, Aitchison, other supervisors, and faculty members started initiatives represented by forming research writing groups among doctoral students to address those problems. The results have shown that even though there were slight differences, all groups relied on educational principles, community, and peer review to help each other in AW in their different programs. In addition, although emerged

lately, research writing group proved to be popular among students as a helpful technique to overcome the obstacles doctoral researchers face during research writing.

Following the same thread, Aitchison and her colleagues carried out two more studies pertinent to research writing groups. The first study, administrated by Catterall et al. (2011), aimed to identify the (non)usefulness of pedagogies used to learn advanced writing skills important for successful doctoral writing. A multi-data method was used to collect the data (a questionnaire, interviews, and focus group). The survey targeted postgraduate students and supervisors from various disciplines including nursing, biomedical and natural sciences, engineering, computing, and math. It was found that supervisor's feedback on student writing was critical and it was the main pedagogical technique for learning and teaching research writing. Some supervisors and students reported their positive outcomes of taking part in social writing and evaluating educational contexts, such as writing retreats, writing groups, peer feedback writing. The second mixed-method study, applied by Ross et al. (2011), has looked into the writing experiences and needs of research students in science fields in an Australian university. The aim of the study was to identify the AWDs in research for both students and supervisors and the strategies that should be followed to overcome those difficulties. The findings of the study corresponded relatively to those of the first study indicating that supervisors' key role, the importance and difficulty degree of the writing tasks, and the stress, anxiety, and struggle both students and supervisors encountered in the process related to learning how write.

Douglas's study (2015) on the other hand, focused on developing an EAP writing course for L2 graduate students in science fields that took into account the writing mechanisms in their various fields. Douglas confessed that there were some challenges related to the variety of disciplines represented by the students. However, she assured that this variety "enriched the course

greatly by offering a range of research projects and writing patterns to study" (12). Using adaptable templates, Douglas assigned her students journal articles from their own disciplines and taught them how to analyze and report the conventions used in those articles in order to enhance their learning process. In addition to the linguistic obstacles related to the rhetorical conventions of the school and field, L2 graduate writers are also required to defeat cultural variations in writing style; for example, the American AW emphasizes the argumentative style while in other countries it basically focuses on paraphrasing. The results showed that this course helped students by providing them with needful feedback necessary to improve their scientific writing.

GRE and TOEFL Writing Scores

Graduate Record Examination (GRE) and Test of English as a Foreign Language (TOEFL) are standardized tests used to measure English language proficiency of international graduate applicants who want to continue their Master, Ph.D., or E.Ds. degrees in the United States. Each one of them has its own sections that are designed to assess certain cognitive traits. For the purposes of this study, only the writing section of each test will be described, but general literature about the GRE/TOEFL test swill be considered.

The GRE Analytical Writing Test

Students who take the general GRE test have also to complete the writing section of the GRE test. This section consists of two parts: "Analyze an Issue" task and "Analyze an Argument" task. For the first task, students select one topic out of two and are required to provide their view point on this general topic and constructing a case by taking a position. They can discuss this topic from any perspective they want providing examples to support their opinions as long as they do not exceed the 30 minutes allocated for the task. For the second task, "Analyze an Argument,"

students receive only one topic and are asked to evaluate the reasoning behind this topic. Instead of taking a position, agree or disagree, test takers are required to examine the logical veracity of the. The time given for this task is 30 minutes and students should provide a well-written critique text about a written argument by evaluating the presented claims and assessing the accompanying evidence (ETS, 2019).

The purpose of the writing portion in the GRE test is to provide evidence of applicants' abilities to create complex thoughts effectively and clearly, investigate given assumptions, support ideas with related examples, and use the conventions AW in English accurately. The answers of both tasks are scored by two readers on a 6-point scale. The readers evaluate the overall writing quality in the entire task rather than using specific points. (Powers & Fowles, 2000). Some scholars claim that the writing section of the GRE test is more pertinent to the real writing skills of graduate students than personal statements, and that GRE writing readers evaluate the same linguistic and thinking features as graduate faculty do when deciding the quality of an essay (Powers & Fowles, 1997).

Several questions have led prior research about GRE test in relation to graduate education, amongst them are: how much do US university graduate programs rely on this test in their graduate admission process? And can GRE scores predict graduate students' performance later in their graduate fields? Both questions are actually interrelated since answering one of them will eventually lead to answer the other.

In terms of the predictive nature of the GRE test, the findings of prior research rendered mixed results. For instance, Wao, Ries, Flood, Lavy, & Ozbek, (2016) conducted a study to explore if GRE scores can predict the performance of construction management graduate students. In other words, it was hypothesized that students who got high scores in the GRE test would achieve high

GPAs at the end of their graduate study. The results indicated that GRE had weak predictive indicators regarding students' performance in construction management graduate program. Another study with similar purpose aimed to assessing the abilities of the GRE test to predict the completion of the Pd.D. degree in science, technology, engineering and mathematics (STEM) disciplines in four universities in four different states. The results have shown that GRE scores were not significant predictors of STEM Ph.D. completion for students. In addition, GRE scores could not specify students who dropped off during the first year nor was it able to predict the time to finish a degree (Petersen, Erenrich, Levine, Vigoreaux, & Gile, 2018). The conclusions of both studies were consistent indicating that GRE scores were an ineffective selection tool for graduate admission, and therefore, it was recommended not to use its scores in the admission process to identify future graduate students. Moreover, it was suggested that the admission criteria of some graduate programs needed to be reconsidered to fit excluded talented students who were kept out of the graduate education because of their GRE scores (Petersen et al., 2018; Wao et al., 2016). Rakedzon, and Baram-Tsabari (2017) agreed with the results of those studies adding that the writing section of the GRE is designed only to evaluate certain writing aspects like cohesion/coherence, but it neglected other important writing issues such as sentence structure, vocabularies, punctuation, content, and genre. Additionally, such standardized tests are usually used either as a method to screen applicants before admitting them in an academic degree program or to decide if they need an EAP writing course before starting in a graduate program.

While many scholars have favored the exclusion of the GRE test from the admission equation, we find advocates who encourage graduate faculty to use the GRE as a predictor of students' achievement in graduate school. For example, Rockinson-Szapkiw, Bray Jr, and Spaulding (2014) carried out a study to determine how GRE scores are used to understand

methodology selection for the dissertation among doctoral candidates as well as students' diligence behaviors. Rockinson-Szapkiw et al. (2014) used multiple data analysis procedures to analyze data obtained from candidates. The results of the MANOVA revealed that there was no difference in the GRE scores based on students' choice of methodology. However, the findings of the regression analysis revealed that candidates' GRE scores and methodology selection influenced significantly the number of semesters needed to complete dissertations. Methodology choice and GRE writing scores were the strongest predictors of dissertation time completion. Using a comprehensive questionnaire, Briihl, and Wasieleski (2007) sought to see how graduate programs use the Analytic Writing section of the GRE in the admission process. Surprisingly, it appeared that only 35% of those graduate programs use writing scores of the GRE in their admission of new applicants reporting low or medium importance of this section in the admission process without having cutoff scores. Therefore Briihl, and Wasieleski (2007) urged graduate program coordinators to assess the possible benefits of the GRE writing as an important part of admission decisions.

The TOEFL iBT Writing Section

Test of English as a Foreign Language (TOEFL) is the most widely used standardized test in the world. This language proficiency test is developed to measure international students' ability to understand and use English language in the graduate level (Kim, 2017). Internet-based TOEFL (TOEFL iBT) has two writing tasks: Integrated Writing and Independent Writing. For the Integrated Writing task, students have to first read a small passage about a topic. Then, they listen to a short conversation pertinent to the same topic of the reading. Then, they have 20 minutes to type their response on the computer. For the Independent Writing task, the test taker is asked to

provide his/her opinion on an issue. The time allocated for tying the computer-typed response for this task is 30 minutes with undetermined length of a response (ETS, 2019).

Just like GRE writing scores, the authenticity and validity of writing tasks of the TOEFL iBT remain under continuous investigation, especially in the admission process of international students into graduate programs in American universities (Staples, Biber, & Reppen, 2018). Another main concern is "the extent to which the characteristics of assessment tasks correspond to the characteristics of the tasks test takers will encounter outside of the test itself. This correspondence is important because it determines the domain to which score interpretations can be generalized" (Llosa, & Malone, 2017, 88). Prior research focused on the extrapolation inference of the TOEFL's writing tasks in relation to the performance scores of various written assignments in the graduate program, comparing the linguistic characteristics of both registers, seeking students and instructors' perception on the writing tasks presented in both.

With respect to the correlational relationship between TOEFL iBT writing tasks and university or program's writing tasks, the results of previous research showed some discrepancies. For instance, Weigle (2011) conducted a study in an ESL setting that aimed at finding correlation between the scores of TOEFL iBT writing independent task and the writing scores of tasks at the university level. The findings have revealed weak to moderate correlations between scores of the independent written portion of the TOEFL and scores students received on their university tasks. The same approach has been applied by Biber, Reppen, and Staples (2017) to identify the relationship between TOEFL iBT's writing scores, for both independent and integrated tasks, and scores received on written texts of students from various academic fields, levels, and registers. Biber et al. (2017) have also found weak correlations between university achievement scores and TOEFL iBT writing scores. However, it was interesting that the scores of the independent task

indicated a stronger relationship to university performance scores, which corresponded to previous expectations, as writing integrated task of the TOEFL require students to use available material, a feature that aligns this task with university academic tasks.

A more recent corpus-based study conducted by Staples et al. (2018) has built on the results of the two studies mentioned above using Multi-Dimensional Analysis to compare the lexico-grammatical features of texts produced by L2 writers in the TOEFL iBT with the features of written texts produced by the same writers in various field writing assignments. Staples et al. found out that the linguistic features of TOEFL iBT written tasks had similar and different patterns to the written tasks required from the same writers in their disciplines. Moreover, the results matched those of Biber et al. (2017) as it pointed out that there were definite similarities between the Integrated TOEFL iBT writing task and certain types of disciplinary writing tasks. However, there were linguistic variations between the independent TOEFL iBT writing task and almost all field-related writing assignments. This general pattern held regardless of the scores and levels of students.

A similar exploratory study, administrated in an Australian university by Riazi (2016), aimed at comparing the linguistic and discoursal characteristics in the written essays of the TOEFL iBT writing tasks and written academic tasks in the graduate programs of 20 postgraduate international students enrolled in three disciplines, science and engineering, business and economics, and arts and humanities. The comparison was conducted using 20 linguistic and discoursal features related to cohesion, lexical sophistication, and syntactic complexity. The findings have indicated certain textual feature similarities between their TOEFL iBT writing tasks and their writing assignments in their graduate programs. These results suggested some evidence

for the extrapolation inference of the TOEFL-iBT test. However, due to the small sample of the study, generalizability was not possible to other contexts.

The comparison between TOEFL iBT writing tasks and university writing tasks is critical to literature and practice. For example, prior studies investigated the linguistic characteristics of written texts of both TOEFL and university writing classes from the perspectives of students and writing instructors in relation to writing performance in both registers. Llosa & Malone (2017), For instance, investigated in their mixed method study the differences and similarities between the writing tasks of TOEFL iBT and university writing undergraduate classes. The questionnaire sought the perception of both students, 103 international students, and 18 writing instructors. The results were interesting since although instructors and students agreed that TOEFL iBT writing tasks could not represent all the writing types in their writing course, they had the same writing quality. Moreover, instructors reported that when they assessed class assignments, they used similar criteria of those listed in the TOEFL iBT writing rubrics suggesting that TOEFL iBT writing tasks and class assignments had similar writing constructs. Another qualitative study was conducted by Kim (2017) sought the perceptions of Korean students of the best preparation techniques for the TOEFL iBT writing tasks, and difficulties they encounter while taking the test. Although the findings were inconclusive due to sample and data collection method, the author suggested revising the format, scoring, and questions of the TOEFL iBT writing section.

Age, Gender, and Race

Most research treats aspects, such as *age*, *gender* and *race* as sociodemographic redundant factors to measure across them other dependent and independent variables. This study assumed,

however, that such factors are closely related to academic writing in doctoral level. Consequently, they were considered as independent variables as well as sociocultural dimensions in the study.

Age

Age is interrelated with other personal and societal aspects such as identity, self-efficacy, and nontraditional students (Koole, & Stack, 2016; Tripp, 2018). As far as the Master and Ph.D. degrees in the United States are concerned, there is no age limit that can prevent students to apply for them. However, if there might be one, it is a decision of the university itself. In fact, most people pursue Ph.D. when they are older after gaining work and life experience and have enough savings (Jain, 2016). In Canadian universities, however, 46 is the average age for studying Ph.D., but it is 40 in other professional jobs. The research about the age and AW is very scarce, which supports my aforementioned claim that though important, this area is neglected in prior studies.

In terms of age and identity, available literature sought students' perceptions about how their identity changed or transformed after starting to study in a graduate program. For instance, the qualitative study of Kool and Stack (2016) explored the perceptions of doctoral students on identity positioning while taking online learning programs at a Canadian university. The findings indicated that due to the wide-range age of the participants, 40-59, and their careers, they feel more comfortable to use distance learning since such programs help them draw a new identity for themselves within the academic context.

With respect to nontraditional students, a definition of who they are might be a good first step. According to Crite Jr (2013), the term *nontraditional graduate students* refers to any learner whose age is between 20 to 60 years old, has full/part-time work and study at the same time, mostly married, combine work and family responsibilities with studying in a graduate program, has rich

work and life experience. The aforementioned criteria are a little bit different for other scholars. For example, Offerman, (2011) argued that while the term "traditional doctoral student" is used to describe students who continue a doctoral degree at a young age (25-30), white male, and unmarried, the term "nontraditional doctoral student" describes a doctoral student whose age is within the range of 33 to 42 years, married, have family and work tasks, studying part time, and financially independent. However, Tripp (2018) claimed that due to the multiple work and life pressures, many nontraditional students have not practiced their AW in years or even did not get the chance to improve their writing skills which creates uncertainty and anxiety among those writers. Hence the critical role of writing centers where nontraditional students gain their writing confidence again and learn how to use the writing conventions correctly. Moreover, Crite Jr (2013) recommended instructors to use Knowles, Holton, and Swanson's (2005) andragogical adult learning model as a teaching planner in the classroom to address the AWDs of nontraditional graduate students. *Andragogy* means the method and practice of teaching adult learners. Knowles et al. (2005) model is based on the assumption that teaching adult learners (andragogy) is totally different from teaching children (pedagogy) in that pedagogy is a teacher centered approach while andragogy is a learner-centered method where adult learning is facilitated by following innovative techniques in the learning climate, such as being inviting, open minded, and offering psychologically safe environment to exchange ideas and suggestion to promote the learning process. For this reason, it is important for adult instructors to understand adult-learning techniques that can help this population in improving their academic skills.

Although there is a close relationship between age of doctoral students and their AW, Crite Jr's (2013) study was the only research study that supported this claim. Therefore, the present study provided an excellent opportunity to reveal any potential relationship between age of

doctoral students and their AW and use the findings to cast implications to SLW theory, writing pedagogy, and writing support centers.

Gender

The relationship between gender and language has always been a major research area in the fields of sociolinguistics and applied linguistics for more than 3 decades. Two research strands stem from previous studies; gender and language variations in speaking, and gender and language variations in writing. However, more attention was given, in previous research, to the former than the latter (Lillis, McMullan & Tuck, 2018). May be this is attributed to the assumption that women use more words than men, which led consequently to considerable empirical studies that tried to test the hypothesis of the speaking variations existed between men and women (Hartley, 2008). Anyways, the conclusions of such research are pertinent to gender differences in speaking leaving the other side of the equation, gender and AW under-detected which leads us to the important question, related to the context of this study, of whether men differ from women in how they write? Because there is scarcity in research regarding gender differences in AW, there are fewer results to report and unfortunately those few studies got incomparable mixed findings.

The difficulty in tracing gendered writing stems partly from the different genres writing has, open-time class assignments and standard examination essays performed under pressure of time, the small sample size, or the criteria used to conclude that women perform better than men or vice versa. The sample size problem is resolved in some studies by using advance computer programs like Linguistic Inquiry and Word Count (LIWC). Such technology computes word percentage in one text according to chosen categories out of seventy-four various linguistic categories (Hartley, 2008). For example, in her quantitative dissertation study, Behling (2016) used

LIWC to analyze 389 admission essays of the applicants, nontraditional doctoral students registered in 3 online or mixed-mode programs in a university in the Western United States. The purpose of her study was to compare students according to gender and writing-style groups in relation to student success, assessed by the progression of dissertation writing. Writing styles were analyzed using the four linguistic features chosen from LIWC: dynamic and categorical components, complexity and cognitive mechanisms, whereas gender was analyzed according to male/ female base. The results revealed that the dissertation development was significantly influenced by categorical writing, dynamic writing, and cognitive mechanisms. However, the Chi-Square test indicated no significant relationship between gender groups and dissertation progression.

Like age, gender and AW are closely pertinent to other sociocultural aspects, such as feminist movements, and psychological variables like self-efficacy and identity. For instance, in relation to psychological factors or internal factors that can influence writing products, Huerta, Goodson, Beigi, and Chlup (2017) conducted a study to explore the reasons behind writing anxiety among graduate students due to the psychological factors, emotional intelligence and self-efficacy in addition to other demographic variables, such as gender and degree level. Using a survey and three regression models, Huerta et al. (2017) tried to specify which variables can best predict writing anxiety. The findings indicated that self-efficacy was statistically significant as a predictor of writing anxiety whereas emotional intelligence was not. Interestingly, gender also proved to be a strong predictor for writing anxiety in all three regression analyses suggesting that females expressed higher writing anxiety than males. Focusing on similar psychological variables, but in a feminist context, Aitchison, and Mowbray (2013) investigated the role of emotions and family relationships in the writing experiences of women doctoral students during the candidature period

at an Australian university. Although personal emotions have always been considered as subjective impeding factor in acquiring knowledge, the findings of Aitchison and Mowbray's article indicated the opposite since emotions and family relationships motivated positively those women doctoral students to transform all negative emotions and negative relations into positive behaviors that contributed to their successful candidature.

Race

Race and ethnicity are complex and inter-related factors that influence student learning, both before students enter a doctoral program and during the program. "Race" is a social construction used within a culture to categorize groups of people. Despite having no inherent physical or biological meaning, racial identities do influence the quality of education that people receive, both as a group and as individuals. By contrast, but no more clearly defined, "ethnicity" refers to a person's cultural identity. However, in the United States, according to the US Census Bureau, the US specifically tracks and reports 8 "races": "White, Black or African American, Asian, American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander." The US Census Bureau also allows people to report "Some other race alone" or "Two or more races." However, despite there being many cultural groups within the US, the US Census only tracks and reports one "ethnic" group, "Hispanic or Latino." In addition, the US Census allows people who identify with that ethnic groups to choose any "Race." Hispanics in the US are united by a shared language and some broad cultural similarities, though this categorization ignores the many cultural differences among Hispanic and Latino people in the US (United States Census Bureau, 2017).

For the sake of this study, "Middle Eastern" was added as an option for "Race" because of its educational importance in doctoral education. Geographically, the countries that comprise the "Middle East" are spread across three continents: Southern Europe, Northern Africa, and parts of Southwest Asia (Parvini & Simani, 2019; United States Census Bureau, 2017). While the people of this broad region are diverse in terms of cultures, religions, and languages, they disproportionately identify as Muslim, both as a religion and as a general cultural influence. Centuries of religious difference have divided the Middle East from the rest of Europe, differences that are heightened by recent wars involving the US and countries in the Middle East, have led many people of Middle Eastern ancestry to not identify as "racially" or "ethnically" White or European. Because of the large proportion of doctoral students studying in the US from this region and the cultural and linguistic differences they bring to that education, it was an important group to distinguish for the sake of this study.

Because of these considerations, this study offered participants with seven (7) choices of "Race" and the choice to identify as "Hispanic." In the Findings and Discussion, for the sake of simplicity, the results are reported simply using the term "Race," though the author acknowledges that this term oversimplifies a great many complex issues.

Like *age* and *gender*, there is sparse research to inform us about how *race* influenced or predicted AW or AWDs of diverse doctoral students in US universities, but there were ample studies that talk about the experiences of racial/ethnic minority students in graduate education. The available literature addressed race in relation to other areas, such as: how graduate students from different racial background were underrepresented at predominately White universities, the consequences of discrimination on minority populations experiences, and the strategies universities and students used to cope with the discrimination acts (Figueroa, 2015; Gayle,

2016). Several terms that were used by different scholars to refer to diverse doctoral students, such as: "graduate students of color" (Gay, 2004), "minority graduate students" (Regis, 2016), "African-American doctoral students" Crumb (2015), and "Underrepresented Racial Minority Graduate Students" (Figueroa, 2015).

For the purposes of this study and to unify all the aforementioned terms, I will use the term "diverse doctoral students" throughout this section. Even though scholars used different names, their research provided empirical evidence graduate diverse students experience underrepresentation, discrimination, and alienation at predominantly White universities which led in some cases those students to drop off their graduate degree. Gay (2004) maintained in her study that graduate diverse students suffer from three types of marginalization in their doctoral fields, namely: physical, troublesome popularity and neglect, and intellectual and cultural alienation. The author explained these negative race attitudes and behaviors proposing some techniques to solve each one of them. Inspired by her personal status as a graduate student and a professor of color in predominantly White university, Gay described her interactions and observations with diverse graduate students requesting other professors and colleagues to adjust their instruction, curriculum, advising, mentoring and relationships according to diverse students' needs. In doing so, they will help their students to navigate effectively the marginality they face during the graduate level.

In the United States, African Americans have long suffered from discrimination, both as a group and as individuals, that often affects the quality of the education they receive (Crumb, 2015; Regis, 2016). For example, Crumb (2015) curried out his qualitative phenomenological dissertation study aiming to exploring the experiences of African American women students who came from a working-class registered in counselor education Ph.D. program at predominantly White universities. Using semi-structured interviews as data collection method, Crumb (2015)

explained the impact of this population's social class status on their lived educational experiences in counselor education doctoral programs. The three main themes that were identified related to the tenacity of working-class African American doctoral-student women in counselor education were: the advantages of working-class, self-efficacy and persistence progression, and employment of academic and personal support systems.

Among the different kinds of racial experiences that impacted African American graduate students' performance and engagement is *covert* or *subtle* racial behaviors or what is known as racial microaggressions. Microaggressions are short, everyday conversations that imply criticizing messages to diverse people because they belong to a racial or ethnic minority group, frequently subconsciously conveyed in the form of implicit snubs, or disdainful tones, gestures, and looks (Sue, Capodilupo, Torino, Bucceri, Holder, Nadal, & Esquilin, 2007). Regis (2016) investigated relationships between such racial microaggressions, Black racial identity, students' perception of belonging to the graduate school of Black Ph.D. students in psychology, and students' sense of social support. The sample included 172 Black doctoral students in the field of psychology who had been admitted at least one year in the doctoral program. The results of the online survey revealed that diverse graduate students who experienced more acts of microaggressions at school or work felt partial belonging in the psychology Ph.D. program. Moreover, there was not any social support to abate the impacts of microaggressions. However, it was interesting that racial identity attitudes correlated with both sense of belonging and experiences of microaggressions. Similar thesis study, conducted by Gayle (2016), focused on investigating the experiences of doctoral diverse students in psychology by reporting supportive and non-supportive ways that they encountered during their doctoral journey, but in a qualitative framework. The results of the semi-structured interviews revealed that doctoral diverse students there were multiple factors which

expedited their success in their degree, such as faculty support, advanced students within the program, and university resources. Yet, many students reported negative experiences, such as feelings of alienation in the program, being ignored or isolated, and suffering from microaggressions and stereotyping from instructors, clients, and peers. In terms of techniques students used to overcome the aforementioned obstacles, most of them stated that they depended on family and friends' support outside their program.

In another qualitative dissertation study, Figueroa (2015) shed light on the academic/social experiences, and power dynamics faced by graduate diverse students in science, technology, engineering, and math (STEM) doctoral fields that prevented or supported their degree development. Using focus group interviews with 53 STEM graduate diverse students, the author focused on ethnic and racial issues, such as *underrepresentation* to understand the academic and social experiences of this population. The findings demonstrated that when relationships between advisors and students were described by neglect, students felt desperate, misspending energy and time committing repeated mistakes, viewing their experiences negatively, and having eventually digression in classes or research, which may result in degree completion delay or even worse, dropping off the graduate degree. Conversely, some faculty members supported students by helping them navigating difficulties associated with attaining a Ph.D. degree, but allowing at the same time to make critical decisions independently.

In conclusion, most of prior AWD research was qualitative. A search of the literature reported in Chapter 2, found no quantitative research on the factors that predict AWDs among first- year doctoral students. Hence, the quantitative focus for this research was directed towards identifying the factors that best predict AWDs in order to improve the university-wide writing services provided for first-year doctoral students, both international and domestic.

CHAPTER THREE: METHODOLOGY

Research Questions and Purpose

The purpose of this study was to understand the factors that predict AWDs among first-year doctoral students. To accomplish this goal, the following questions guided the methodological part of this study:

RQ1: Are motivation for academic writing, College of study, GRE writing scores, gender, race, and age statistically significant predictors of self-reported academic writing difficulties among first-year doctoral students at a large, public University in the Southeastern United States?

a. How much of the variance in self-reported writing difficulties is explained by motivation for academic writing, College of study, GRE writing scores, gender, race, and age?

RQ2: Are there statistically significant differences between international and domestic students in their levels of motivation for academic writing, self-reported writing difficulties, and GRE writing scores?

Research Designs

This study is an exploratory quantitative non-experimental research, which followed two research designs, correlational design for research question one and its sub-question, and causal comparative for research question two (Gall, Gall, & Borg, 2007). Using two research designs was

suitable and justifiable in this study for two reasons: first, the same data was used to answer both research questions; and second the analysis for research question two was a fairly natural extension of research question one. For the first research question and its sub-question, a correlational research design was used to identify the variable(s) that best predict AWDs among international and domestic doctoral students during the first year in their academic programs. For the second research question, a causal-comparative research design was utilized to understand the mean differences in AWDs, GRE writing scores, and motivation between first-year doctoral groups, international and domestic. For RQ1, *self-assessed writing difficulties (AWDs)* was the dependent variable, and the following factors were used as independent variables: *motivation, field of study, GRE writing scores, gender, race,* and *age*. For RQ2, *motivation, GRE writing scores,* and *AWDs* were the dependent variables, with the demographic variables of *international* or *domestic* as independent variables.

Population and Sample

For the purposes of this study, census sampling procedure was utilized to reach as many members of the population as possible. The recruited sample consisted of two groups, international and domestic students at a large, public University in the Southeastern United States. To be more precise, the sample included students who matriculated during the semesters of Summer 2018, Fall 2018, and Spring 2019. Matriculated means they were actually admitted and started the degree program in any of the aforementioned semesters.

The inclusion criteria included 1) doctoral students, 2) who were enrolled in different doctoral programs, 3) in their first year in the academic doctoral program, 4) from different nationalities who are required to write their assignments in English as a second language, and 5)

some of them were native English speaker who were required to write their assignments in English as a first language. It should be noted that there was a small population who were domestic students but may not have been native speakers of English (e.g. Puerto Rico). This population was excluded from the analysis. Additionally, there was a population of international students who are native speakers of English, such as those from Canada, the UK, and Australia. These students were also excluded.

There were 9,168 graduate students at the university during 2018-2019 academic year distributed over more than 100-degree graduate program (UCF Facts, 2019). From this population, there were 605 first-year doctoral students (pursuing Ph.D., Ed.D., D.N.P., D.P.T.) who were admitted in Summer 2018, Fall 2018, or Spring 2019 and considered active students. Those students were the target of this study and were asked to participate in the final survey.

To answer the research questions, multiple statistical analyses were used: Multiple Linear Regression (MLR), multivariate analysis of variance (MANOVA) and Multivariate analysis of covariance (MANCOVA) for research questions one and two respectively. Although those methods were utilized to analyze the same data, they are different from each other in terms of the kinds of variables included (see Data Analysis Procedures section).

A priori G* Power analysis determined that the minimum number of participants needed for the study to have power with statistical significance was 160 ($\alpha = .05$, power = .95, $f2 = .15$) for MLR and 160 ($\alpha = .05$, power = .95, $f2 = .15$) for the MANOVA (Hair, Black, Babin, & Anderson, 2010; Maxwell, Kelley, & Rausch, 2008). Assuming that the university will have about 400 first-year doctoral students for the semesters of Summer 2018, Fall 2018, and Spring 2019, and to meet the required minimum sample size (160), the required response rate will be 40%.

However, after collecting the data, a sensitivity G* Power analysis was conducted to the MLR data to compute the required effect size using the given α value (α = .05) and sample size (*n* =111). The results indicated that the effect size detected was (*f2* = .19) with total number of 5 variables (predictors). A similar sensitivity analysis was conducted for the MANOVA to compute the required effect size using the given α value (α = .05) and sample size (*n* =111). The results indicated that the effect size detected was (*f2* = .12) with total number of 2 response variables.

Table 1. Descriptive Statistics of the Doctoral Population

	Total Enrollment of Doctoral Students		
	Summer 2018	Fall 2018	Spring 2019
Status			
Domestic	999	1367	1328
International	506	793	774
College			
Arts and Humanities	23	59	56
Business Administration	27	43	42
Community Innovation and Education	254	346	330
Engineering & Computer Science	432	722	701
Health Professions and Sciences	115	111	111
Medicine	43	58	56
Nursing	134	188	202
Optics & Photonics	90	116	110
Hospitality Management	26	30	30
Science	349	469	448
Gender			
Male	18467	30879	29477
Female	24725	37679	35977
Race			
White or Caucasian	20765	32754	31083
Black or African American	4997	7541	7184
American Indian or Alaska Native	80	112	104
Native Hawaiian or Pacific Islander	71	105	105
Asian	2791	4319	4122
Multi-Racial	1594	2505	2430
Hispanic/Latino	10960	17835	17137

Recruitment

In order to attain the minimum required sample size to achieve sufficient statistical power, the primary means of recruitment was an approved email sent through the researcher's advisor.

Instrumentation

The finalized survey included 16 questions. Of these, 2 were screening and sorting questions. The other fourteen survey questions addressed first-year doctoral students' self-assessed responses regarding the factors that mostly predicted their AWDs. The final survey also included a Skip Logic to further qualify participants. For instance, if the qualifying question of *"Are you currently enrolled in the first year of a doctoral program at the university?"* is answered *"No,"* the participant then was moved to the end of the survey and that response was not counted or analyzed. Efforts were made to reduce the sensitivity of the questions so that participants do not feel that their identities are going to be revealed if they answer the questions, particularly, the demographic items. Thus, the survey packet showed respectively: (a) Screening & Sorting Questions, (b) Academic Writing Difficulties Scale (AWDs) (Gurel, 2010), (c) Extrinsic and Intrinsic Motivation Scale (EIMS) (Naderi et al., 2014), (d) GRE/ TOEFL's Writing Scores Scale, and (d) a Demographic Questionnaire.

All of the data for this study were collected using a single survey instrument containing adapted and new scales intended to measure the necessary dependent and independent variables stipulated in the research questions (see Table 2 and Appendix C). The construction of the survey as a whole was guided by Dillman, Smyth, and Christian (2014). The subconstructs of the adapted scales are shown in Table 1 in their original sources. Table 2, however, illustrates all the scales, new and adapted, and their corresponding items in the current study. For instance, The Extrinsic

and Intrinsic Motivation Scale (EIMS) includes the subscales of *Identified regulation, Integrated regulation, Introjected regulation, External regulation, and Amotivation* in AWDs. The third column in Table 2 shows the indicators or the items corresponding to these subconstructs. For example, items from 3.1 to 3.4 refer to *academic writing difficulties* scale.

Table 2. Survey Constructs and Item Numbers in Original Sources

Previous Studies	**Name of Construct**	**Item Numbers/Indicators**
(Gurel, 2010)	Perceived Difficulties Encountered a) Linguistic Difficulties	22-28
(Naderi et al., 2014)	Work Extrinsic and Intrinsic Motivation Scale (WEIMS) a) Identified regulation b) Integrated regulation c) Introjected regulation d) External regulation e) Amotivation	1- 45 a) 1, 2, 3 b) 4, 5 c) 6, 7 d) 8, 9 e) 10, 11, 12

Table 3. Survey Constructs and Item Numbers in the Current Study

Adapted Scales	Name of Construct	Item Numbers/Indicators	Population
	Screening & sorting questions	1.2, 2.1	All Participants
(Gurel, 2010)	Academic writing difficulties	3.1, 3.2, 3.3, 3.4	All Participants
(Naderi et al., 2014)	Extrinsic and Intrinsic Motivation Scale (EIMS)	4.1, 4.2	All Participants
	Identified regulation	4.1.1, 4.1.2, 4.1.3	All Participants
	Integrated regulation	4.1.4, 4.1.5	All Participants
	Introjected regulation	4.1.6, 4.2.1	All Participants
	External regulation	4.2.2, 4.2.3	All Participants
	Amotivation	4.2.4, 4.2.5, 4.2.6	All Participants
	GRE/ TOEFL's Writing Scores	5.1, 5.2	International students
	Demographic Questionnaire	6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7	All Participants
	Field of study (College)	6.1	All Participants
	Admission semester and Degree	6.2, 6.3	All Participants
	Gender	6.4	All Participants
	Age	6.5	All Participants
	Race	6.6, 6.7	All Participants

Adapted Scales

Two published pre-validated instruments were used to structure the items of two major constructs in the instrument: a) Academic Writing Difficulties Scale (Gurel, 2010), and b) The Extrinsic and Intrinsic Motivation Scale (EIMS) (Naderi et al., 2014), both discussed more in the following sections.

Academic Writing Difficulties Scale

Academic writing difficulties scale was adapted from Gurel's (2010) Perceived Difficulties Encountered instrument. The original scale, which included 16 items, represented self-reported linguistic and socio-cultural difficulties faced by Turkish engineering doctoral students while writing their dissertations. The present study adapted the linguistic items of this scale and used them in the final survey as a five-point Likert scale that ranged from *Extremely difficult* to *Extremely easy* representing AWDs among first year doctoral students. However, the subconstructs of this scale were different from those in the original study in that for the purposes of this study, the AWD consisted of the four main subscales*: Difficulties, Mechanisms, Style, and Genre*. Thus, the scale used in the analyses was created by summing the data collected for the items of all of the four AWD's subscales. In addition, a Cronbach's Alpha was used to check the internal consistency of the scale and it had .95 before data cleaning and .94 after data cleaning.

Extrinsic and Intrinsic Motivation Scale (EIMS)

EIMS was used and validated by Naderi et al. (2014) when they used it to investigate the dynamics of extrinsic motivation in a crowdsourcing micro-task platform. EIMS represented the

underlying dimensions of *Identified regulation, Integrated regulation, Introjected regulation, External regulation,* and *Amotivation*. The survey was validated by the authors using Cronbach's alpha and Confirmatory factor analysis (see the article for more details). This scale's items were measured on a seven-point Likert scale from 1 (Does not correspond at all) to 7 (Corresponds exactly) the extent to which the items' statements were applicable to the participants.

The study adapted Naderi et al.'s (2014) version of EIMS to assess first-year doctoral student's extent and type of motivation while performing AW in the doctoral level. The EIMS, which was employed in this study, is shown in Table 2. It consisted of l2 items scored on a five-point Likert scale from Strongly agree (1) to Strongly disagree (5). For the purpose of this study, the EIMS which consisted of 12 items was divided within two items in the main survey (4.1-4.2). Like the AWD scale, the researcher ran a reliability analysis on EIMS and the preliminary analysis before imputation revealed a Cronbach's α of .73. In order to improve the reliability score, the researcher removed items 4.2.4, 4.2.5, and 4.2.6 as they did not load strongly in the exploratory factor analysis. By removing those three items and after the imputation, the internal reliability of the scale had a Cronbach's α of .82 (see Table 5).

In addition to these two scales, GRE/ TOEFL's writing scores scale was added in order to explore if those scores were able to predict AWDs that international doctoral students face. It used the interval scores that are used on the writing portion of the GRE/TOEFL tests. However, only the GRE data was used in the analyses since the TOEFL was missing considerable amount of data.

Demographic Questionnaire

The final section of the instrument is a *demographic questionnaire*, which included *field of study (College), age, gender, and race.* These last-mentioned constructs represented the other

factors that might predict AWDs for first-year doctoral students in addition to motivation and GRE writing scores. Items for the aforementioned variables were established in the demographic questionnaire (Appendix C). Table 2 also provides an abbreviated explanation of the demographic questionnaire constructs.

Pilot Study

In order to improve the final survey's questions, a pilot survey was administered at the end of November 2018 with a qualified population sample of first-year doctoral students at a large-research university in the Southeastern United States via personal invitation seeking preliminary results of the variables that predict AWDs. Another purpose of the pilot survey was to determine the writing genres the researcher intended to include in this study. All the items were reviewed by several TESOL professionals, who work in higher education before including them in the final survey version of the current study. The sample consisted of 60 first-year doctoral students. The overall responses obtained were 56. The pilot survey was open for two weeks, giving participants time to return and complete the survey if they have been interrupted.

Construction, administration, and distribution of the survey was done using the Qualtrics web-based application software. The survey consisted of seven scales. The layout of the survey was simple since each scale included several items listed followed by enough white space between the question and its options. The items were loaded for participants one at a time. There was also a progress bar at the top of the survey to show how far the participant is into the survey. The data from the pilot was analyzed and the suggestions of the participants were addressed, and this information has been used to improve the items of the final version of the survey.

Data Collection

The university's Institutional Review Board (IRB) has approved the study request on November 1, 2018 considering this study as Exempt from Human Research. The exemption letter can be reviewed in Appendix A. Once the IRB approval was obtained, the pilot study was launched and completed by November 15, 2018. The data from the pilot was analyzed and the suggestions of the participants were addressed, and this information has been used to improve the items of the survey. The final survey was open for two months and two reminders were sent to participants during that period to get as many responses as possible.

Data was collected through an online survey that was distributed to both international and domestic first-year doctoral students at a large-research university in the Southeastern America. The instrument was password-protected, and participants were provided with a Qualtrics link to facilitate the access either via a desk computer, laptop, mobile device, iPad or any other android device. This survey methodology was chosen to reduce both overall time and cost, and to reach as large sample as possible more efficiently (Dillman et al., 2014).

Data Analysis

Since this study followed two designs, correlational and causal-comparative, data analysis was analyzed via SPSS software, version 24, utilizing two statistical procedures and a post hoc analysis, namely: MLR, MANOVA, and MANCOVA. MLR was used to analyze data obtained for research question one and its sub-question, while MANOVA and MANCOVA were implemented to analyze data obtained for research question two. Even though all statistical analyses are multivariate data analysis methods, MLR was used to study the strength of relationships and predictions among variables while MANOVA was used to examine differences

among dependent and independent variables. MANCOVA, on the other hand was used as a post hoc for MANOVA controlling for the GRE writing scores.

Multiple Linear Regression (MLR)

MLR is a statistical predicative analysis used to explain/ predict the relationship between one continuous dependent variable and multiple independent variables (Hair, 2010). The independent variables are referred to as *explanatory variables*, and can either be continuous or categorical, which can be dummy coded as appropriate. The main assumptions for the MLR analysis that the researcher tested were *linearity*, *normality*, *multicollinearity*, *homoscedasticity*, and *univariate and multivariate outliers*. These assumptions were tested for the continuous variables only in the Analyses Assumptions section in Chapter Four.

This data analysis method was chosen to analyze data obtained from research question one and its sub-question for two reasons: a) the predictive nature of MLR model is useful in determining which IV(s) has/have the most potential to predict AWDs among first-year doctoral students, which is the first purpose of this research, and b) MLR takes into account the relationships among several combined IVs to explain their variance in the DV (Gorard, 2012).

Multivariate Analysis of Variance (MANOVA)

Multivariate analysis of variance (MANOVA) is the extended form of the univariate technique ANOVA. It is a statistical inference procedure that is mostly used to analyze data that involve more than one dependent variable at a time (Warne, 2014). The main goal of using MANOVA is to "analyze a dependence relationship represented as the differences in a set of dependent measures across a series of groups formed by one or more categorical independent measures" (Hair, 2010, 450). In other words, MANOVA was used in this study to analyze the

mean difference between the two groups of the categorical IV represented by the *status* across the continuous DVs of *motivation*, *AWDs*, and *GRE writing scores*. MANOVA has several important assumptions that has been checked before analyzing the data which include *normality, linearity, multicollinearity, Equality of variance matrices,* and *multivariate outliers* (Hair et al., 2010).This multivariate procedure has been chosen to analyze data related to research question two due to its ability to: a) combine "multiple dependent measures into a single value that maximizes the differences across groups" (Hair et al., 2010, 444), and b) allow examining independent variables (group differences) on linear combinations of dependent variables (quantitative variables). In this sense, MANOVA helped showing mean differences in the AWDs, GRE writing scores, and Motivation, between international and domestic students.

Multivariate Analysis of Covariance (MANCOVA)

Multivariate Analysis of Covariance (MANCOVA) was conducted as a post hoc for MANOVA since the result of MANOVA was not significance for Motivation between international and domestic students.

The second research question of the present study required a comparison between the two groups of first year doctoral students on the combination of the dependent variables of Motivation, GRE writing scores, and AWD. The MANOVA results indicated that Motivation was not statistically significant between the two groups. Therefore, MANCOVA was used as a post hoc analysis to control GRE writing scores and examine the variance of AWDs and Motivation between international and domestic students. The researcher checked MANCOVA's assumptions before proceeding in the analysis, and these include *absence of outliers, normality, linearity, and homogeneity of covariance.*

CHAPTER FOUR: RESULTS

Research Questions and Purpose

The purpose of this study was to understand the factors that predict AWDs among first-year doctoral students. To achieve this objective, the following research questions guided the analyses:

RQ1: Are motivation for academic writing, College of study, GRE writing scores, gender, race, and age statistically significant predictors of self-reported academic writing difficulties among first-year doctoral students at a large, public University in the Southeastern United States?

a. How much of the variance in self-reported writing difficulties is explained by motivation for academic writing, College of study, GRE writing scores, gender, race, and age?

RQ2: Are there statistically significant differences between international and domestic students in their levels of motivation for academic writing, self-reported writing difficulties, and GRE writing scores?

The data were analyzed using the Statistical Package for the Social Sciences (SPSS; Mac and Windows Version 24.0). The chapter starts with a brief description of the sample and data collection, followed by a description of how the data were prepared for analysis. Data preparation included *entering and coding the data*, *data screening and cleaning*, *and missing data treatment*. Next, the descriptive statistics for the demographic and continuous variables are described. Then the chapter proceeds to verify the statistical assumptions prior to the main data analysis. The

research questions were examined using: (a) Multiple Linear Regression (MLR), and (b) Multivariate Analysis of Variance (MANOVA). Multivariate Analysis of Covariance (MANCOVA) was used as a *post hoc* analysis for the MANOVA. They are presented in this chapter in the following order: (a) Research Question 1 and its sub question, using MLR analysis; (b) Research Question 2, using MANOVA analysis results followed by a MANCOVA.

Sampling and Data Collection

The population for this research investigation involved international and domestic first year doctoral students who matriculated at university's various doctoral programs during the semesters of Summer 2018, Fall 2018, and Spring 2019. The participants were recruited from a large-research Southeastern university in USA. Prior to recruiting participants for the investigation, the researcher obtained Institutional Review Board (IRB) approval from the university and permission from its College of Graduate Studies. Following IRB approval of the study, the researcher implemented a pilot study to assess the survey's items and address any problems or suggestions participants had to validate the final version of the survey.

The primary means of data collection for this study was an online password-protected survey, distributed by the researcher's advisor to maintain participants' confidentiality. Participants were asked to complete the online survey through Qualtrics. Dillman's *Tailored Design Method* (2014) was used to increase response rate. Participants were contacted three times through email requesting participation in the research. The first email included a consent, information about and description of the investigation, and a link to complete the survey. The second email contact was a reminder for participants of the study, providing information related to the study, and a link to the online survey. The final email contact was a final reminder for

students that the study was closing soon and provided a link to participate in the study. All emails included an opt-out option for participants so that they will *not* receive additional information regarding the study in the future and to remove their name from the recruitment list.

The final version of the survey included: (a) Screening & Sorting Questions, (b) Academic Writing Difficulties Scale (AWDs) (Gurel, 2010), (c) Extrinsic and Intrinsic Motivation Scale (EIMS) (Naderi et al., 2014), (d) GRE/ TOEFL's Writing Scores Scale, and (d) a General Demographic Questionnaire.

Data Cleaning

It was necessary to prepare the data collected through the online Qualtrics survey before running the primary data analyses. This section outlines the data preparation processes employed by the researcher and included; (a) entering in the data, (b) screening and cleaning the data, (c) missing data treatment.

Entering in and Coding the Data

Four psychometric scales were included in the survey: The Academic Writing Difficulties Scale (Gurel, 2010), the Motivation Scale (Wagnild, 2009), The GRE Scale, and the Demographic Scale.

The Academic Writing Difficulties Scale contained four groups of Likert-type items, ranging from 1-5 (1-Extremely Difficult, 2-Somewhat Difficult, 3-Neither easy nor Difficult, 4-Somewhat easy, 5- Extremely Easy). Thus, items were coded so that greater values corresponded with greater perceptions that academic writing is easy. The AWD Scale did not contain any reversely scored items.

The Motivation Scale contained two sub-sections of Likert-type items, ranging from 1-5, where the anchors were "Strongly Agree" with a value of one, and "Strongly Disagree" with a value of five. The Motivation Scale did contain three reverse-scored items; motivation items 10, 11, and 12 which were recoded as 10 R, 11 R, and 12 R. These items were recoded in Qualtrics to the appropriate value (5-Strongly Agree, 4-Somewhat agree, 3-Neither Agree nor Disagree, 2-Somewhat Disagree, 1-Strongly Disagree). Higher values on the Motivation Scale can be interpreted to imply that a participant is *not* motivated to improve their academic writing.

The GRE Scale contained two Likert-type items, ranging from 1-6, where the anchors were "1" with a value of one, "1.5" with a value of two, till "6" with a value of 11. Items were coded within Qualtrics so that greater values imply greater ability with analytic writing.

Further examination of the AWD and Motivation Scales is provided in the "Instrument Reliability" section of this chapter. The psychometric items of the survey were coded within the Statistical Package for Social Sciences (SPSS) Version 24, where the data was also screened, cleaned, and analyzed.

Data Screening and Cleaning

Screening and cleaning data include various processes that eliminate any errors in the data, such as: unreliable and vague survey questions, problems with participants response processes, and data entry (Pallant, 2013; Tabachnick & Fidell, 2013). Errors left uncorrected during the data preparation process could create issues during the primary data analyses (Pallant, 2013; Tabachnick & Fidell, 2013). In the demographic data, categories with 0 participants were removed (see Table 4). Also, demographic variables with only one or two participants were combined into new values to facilitate the analysis process. For example, the participants in three PhD programs

– Modeling & Simulation, Optics & Photonics, and Hospitality Management – were merged into a new category, "Other." The same process was used for the demographic variable the Race by merging the American Indian or Alaska Native values into a new category, "Other". Categorical variables included in the MLR analysis for RQ1 were dummy coded. The categorical IVs were, *College of study, gender, race,* and *age* (see Appendix D).

For RQ2, the IV was Status which was a categorical variable that has two groups, international and domestic. In the comparison between domestic and international students, domestic students were coded as 1 and international students were coded as 2. Frequency analysis revealed that there were no missing data and all cases were coded as either 1 or 2.

Missing Data Treatment

Identifying and implementing remedies for missing data is a four-step process: *determining the kind of missing data*, *data missing extent*, *diagnosing the randomness of the missing data*, and *selecting the appropriate imputation procedure* (Hair et al., 2010). Since data can be lost for several reasons, a researcher must know and understand all types of missing data if he/ she wants to apply a suitable way to handle it. In other words, it is important to diagnose the randomness of the missing data to be able to select the appropriate imputation procedure. The three main types of missing data are *Missing Completely at Random* (MCAR), *Missing at Random* (MAR), and *Missing Not at Random* (MNAR) (Manly & Wells, 2015). MCAR data represents the data that went missing due to completely random reasons that are unrelated to observed or unobserved variables. With MAR data, the data are pertinent to observed variables that are once controlled for in the analysis, it will ultimately be MCAR data. The situation is more difficult and

complicated in MNAR data where missingness is caused by either unobserved variables or the DV itself. After identifying the kind of missing data, a proper imputation model is applied.

In this study, the results of Little's MCAR test indicated non statistically significance value (.077) suggesting that the data were missing completely at random (MCAR). Most data were missing for some items in the *AWD scale* (Genre items 3.1, 3.4, 3.5, and 3.7), Motivation scale (items 4.2.4, 4.2.5, and 4.2.6), *GRE and TOEFL writing scores*, and demographic variables, such as College, race, and gender. Missing data in those constructs can be attributed to several reasons, such as participants who refused to answer questions, missed filling out sections of a survey, or skipping demographic variables. Rates of missing data were explained in Table 4 below.

Imputation is the process of estimating the missing values depending on the valid values of other variables in the data. The purpose of imputation is to use known relations that can be specified in the valid values to help in estimating the missing values (Hair et al., 2010; Manly & Wells, 2015). *Multiple Imputation (MI)* model has been used to impute the missing data in this study since it is the most appropriate procedure that can be used to impute MCAR missing data (Manly & Wells, 2015). Variables used in the imputation phase included: *AWD scale*, *Motivation*, *GRE writing scores, College*, Gender, *Age*, and *Race*. The imputation model used *linear regression* to estimate the missing values. MI was chained in SPSS v. 24 with 20 imputation iterations.

After 20 imputation iterations, there were still missing values after the interpolation, especially in the categorical data. Four items in the *AWD scale* (Genre items 3.1, 3.4, 3.5, and 3.7) and three items in the Motivation scale (items 4.2.4, 4.2.5, and 4.2.6) were removed from the analysis. For the remaining missing demographic data, the researcher recoded these missing values as a new value for each variable. Table 4 showed the percentages of missing values before and after multiple imputation.

Descriptive Data Results

Descriptive statistics for categorical data were calculated using frequency counts and percentages. Descriptive statistics for continuous data were calculated using the mean, median, standard deviation, skewness, and keratosis. The following sections discuss the descriptive statistics for the demographics and variables of the study.

Sample Size and Power Analysis

The researcher distributed the online Qualtrics survey to all first-year doctoral students at a large state university in southeastern United States. The accessible sample included 605 first-year doctoral students after any students who indicated that they did not want to be contacted were removed. At the end of data collection (60 days), there were 129 respondents who accessed the survey initially, a response rate of 21.3%. Of the initial 129 people, 7 respondents were removed since they did not meet the inclusion criteria of the study. Additionally, 15 respondents were removed because they either indicated that they were not first-year doctoral students, or they completed less than 50% of the survey. Although this may have been an entry error, those respondents were deleted to maintain the integrity of the study's inclusionary criteria. Thus, the final sample was $N = 111$.

The sample in the current study was somewhat representative of the first-year doctoral students' population. Most participants were in their late twenties and early thirties ($n = 61$, 54%), from various ethnicities, pursuing their Ph.D., Ed.D. or D.N.P. degrees. Two-thirds of the participants ($n = 83$, 73.5%) were admitted in Fall 2018. There was good representation across Status and Degree. The sample was somewhat unrepresentative in some values of the variables Age, College, Race, and Gender. The sample overrepresented domestic participants within the

Status variable (n = 87, 77.0%) and females within the Gender variable (n = 60, 53.1%) (see Table 4).

Table 4. Descriptive Statistics of the Sample Before and After Data Cleansing

	Before		After	
Characteristics	Total *(n)*	(%)	Total *(n)*	(%)
Status				
Domestic	87	77.0	87	77.0
International	25	22.1	25	22.1
College				
Arts and Humanities	4	3.5	4	3.5
Business Administration	3	2.7	3	2.7
Community Innovation and Education	33	29.2	33	29.2
Engineering & Computer Science	17	15	17	15
Modeling & Simulation	1	0.9	-	-
Health Professions and Sciences	0	0	-	-
Medicine	0	0	-	-
Nursing	12	10.6	12	10.6
Optics & Photonics	2	1.8	-	-
Hospitality Management	1	0.9	-	-
Science	17	15	17	15
Other	-	-	4	3.6
Missing	-	-	21	18
Admission Semester				
Summer 2018	4	3.5	4	3.5
Fall 2018	83	73.5	83	73.5
Spring 2019	14	12.4	14	12.4
Other	1	0.9	1	0.9
Degree				

	Before		After	
Characteristics	Total *(n)*	(%)	Total *(n)*	(%)
Ph.D.	70	61.9	70	61.9
Ed.D.	20	17.7	20	17.7
D.N.P.	13	11.5	13	11.5
D.P.T.	0	0	-	-
Gender				
Male	39	34.5	39	34.5
Female	60	53.1	60	53.1
Transgender Male	1	0.9	1	0.9
Transgender Female	0	0	-	-
Non-binary	0	0	-	-
Prefer not to answer	2	1.8	2	1.8
Missing	-	-	9	8.1
Age				
24 or younger	11	9.7	11	9.7
25-34	61	54	61	54
35-44	12	10.6	12	10.6
45-54	13	11.5	13	11.5
55-64	5	4.4	5	4.4
65-74	0	0	-	-
75-84	0	0	-	-
85 or older	0	0	-	-
Race				
White or Caucasian	71	62.8	1	62.8
Black or African American	5	4.4	5	4.4
American Indian or Alaska Native	1	0.9	-	-
Native Hawaiian or Pacific Islander	0	0	-	-
Asian	15	13.3	5	13.3
Middle Eastern	4	3.5	4	3.5

	Before		After	
Characteristics	Total *(n)*	(%)	Total *(n)*	(%)
Other	5	4.4	5	4.4
Missing	-	-	1	9.0

A *priori* G* Power analysis determined that the minimum number of participants needed for the study to have power with statistical significance was 160, assuming $f^2 = .15$ ($\alpha = .05$, power = .95) with total number of 8 variables (predictors) for MLR. The estimation of the minimum number of participants was also 160 participants calculated for MANOVA using a priori G* Power analysis ($\alpha = .05$, power = .95, $f2 = .15$) (Hair, Black, Babin, & Anderson, 2010; Maxwell, Kelley, & Rausch, 2008). Assuming the university would admit about 400 first-year doctoral students for the semesters of Summer 2018, Fall 2018, and Spring 2019, and to meet the required minimum sample size (160), requiring a response rate of 40%.

After three rounds of recruitment, a total of 111 usable surveys were collected. A *sensitivity analysis* was conducted using G* Power for the MLR, assuming values of α=.05 and ß=.05, n =111, and five (5) predictor variables. The results indicate that these data can detect statistically significant relationships around or above $f^2 = .19$. A similar sensitivity analysis was also run for the MANOVA to compute the required effect size to detect statistically significant differences, again assuming values of α=.05 and ß=.05, n =111. With 2 dependent variables and an independent variable with two (2) values (domestic or international), the results of the sensitivity analysis indicated that we could expect to detect statistically significant differences of around or greater than $f^2 = .12$.

Descriptive Statistics Results of Continuous Variables

In addition to the demographic descriptive statistics, descriptive statistics of the continuous variables (AWD, Motivation, and GRE writing scores) before and after imputation were calculated and presented in Table 5. All of the study variables were normally distributed. All skewness values

fell within the acceptable range of -1 to +1 suggesting that the data were approximately normal. The measures of central tendency for the three variables indicated that the means and standard deviations of the constructs were slightly affected by imputation, but only modestly when the means and standard deviations were compared.

Table 5. Descriptive Statistics for Continuous Variables Before and After Data Cleansing

Before Imputation						
Variable	**Total**	**Mean**	**Median**	**Standard Deviation**	**Skewness**	**Keratosis**
AWD	75	64.60	64.00	16.00	0.05	-0.13
Motivation	75	22.10	22.00	7.02	0.41	-0.69
GRE	75	8.95	0.09	2.65	-0.18	-1.35
After Imputation						
Variable	**Total**	**Mean**	**Median**	**Standard Deviation**	**Skewness**	**Keratosis**
AWD	111	66.70	65.00	15.50	-0.01	-0.29
Motivation	111	22.90	22.00	7.46	0.38	-0.75
GRE	111	9.32	10.00	2.75	-0.42	-1.34

Instrument Reliability

Cronbach's alpha was used to determine the reliability of the two main scales: *Self-assessed Academic Writing Difficulties (AWD) scale,* and *The Extrinsic and Intrinsic Motivation scale (EIMS).* The AWD scale used in the analyses was created by summing the items of all of the four AWD's subscales; *Difficulties*, *Mechanics*, *Style*, and *Genre*. The preliminary reliability analysis of AWD measure before imputation had a Cronbach's α of .95. The internal consistency of AWD decreased to an α of .94 after four of the *Genre* items were removed, i.e. 3.1, 3.4, 3.5 3. The four *Genre* items were removed from *AWD* because of the large amount of missing data for those four items, even after imputation. Although the AWD alpha decrease was not expected, a

Cronbach's α of .94 is still a high level of internal consistency, so the small decrease was not a problem (see Table 6).

The preliminary analysis of reliability for the *Motivation* measure before imputation showed a Cronbach's α of .73. To improve the reliability score, the researcher removed items 4.2.4, 4.2.5, and 4.2.6. After removing those three items and re-running the *Multiple Imputation* analysis, the internal reliability of the scale improved to .82 (see Table 6).

Table 6. Internal Reliability of Scales

Before Imputation		
Variable	**N of Items**	**Cronbach's Alpha**
AWD	24	0.95
Motivation	12	0.73
After Imputation		
Variable	**N of Items**	**Cronbach's Alpha**
AWD	20	0.94
Motivation	9	0.82

Analyses Assumptions

Up to this point in the analysis, several processes were used to clean the data and prepare them for analysis. Categorical data were dummy coded, Multiple Imputation (MI) was used to handle missing data (Hair, 2010; Manly & Wells, 2015), and the relative normality and reliability of the continuous data were verified. The reliability of the continuous variables *AWD* and *Motivation* was improved by removing items to ensure that these measures were unidimensional. Next, the remaining statistical assumptions were tested to assure the appropriateness of the data for the intended analyses (i.e., MLR, MANOVA, and MANCOVA).

MLR Assumptions

Multiple linear regression requires that several assumptions be correct for the analysis to be valid (Laerd Statistics, n.d.):

1. The dependent variable should be *continuous*, at either an interval or ratio level of measurement. The dependent variable, *AWD* was continuous.
2. There should be *multiple independent variables* that are either continuous (internal of ratio) or categorical. Two of the independent variables, *GRE writing scores* and *Motivation*, were continuous, and the remaining demographic variables were categorical.
3. The data should exhibit *independence of observations*. Each participant could only respond to the survey once, ensuring independence of observations.
4. The residuals should be *approximately normally distributed.* This analysis is described below.
5. The data should not exhibit *multicollinearity.* This analysis is described below.
6. There should be a *linear relationship* (a) between the dependent variable and each independent variable, and (b) between the dependent variable and the independent variables collectively (i.e., multivariate linear). This analysis is described below.
7. The data should be *homoscedastic.* This analysis is described below.
8. The data set should not include any *univariate and multivariate outliers.* This analysis is described below.

Except for assumption #2, these assumptions were tested for the continuous variables only.

In terms of *univariate normality*, MLR assumes that the data of the dependent variable is normally distributed. The Shapiro-Wilk normality test was not significant (p = .072) suggesting that the normality assumption was met, and the data were normally distributed. A histogram (Figure 4) of the AWD data also shows that these data were relatively normal.

Table 7. MLR Normality Assumption Test for the Dependent Variable (AWD)

	Shapiro-Wilk		
	Statistic	*df*	Sig.
AWD	.979	111	.072

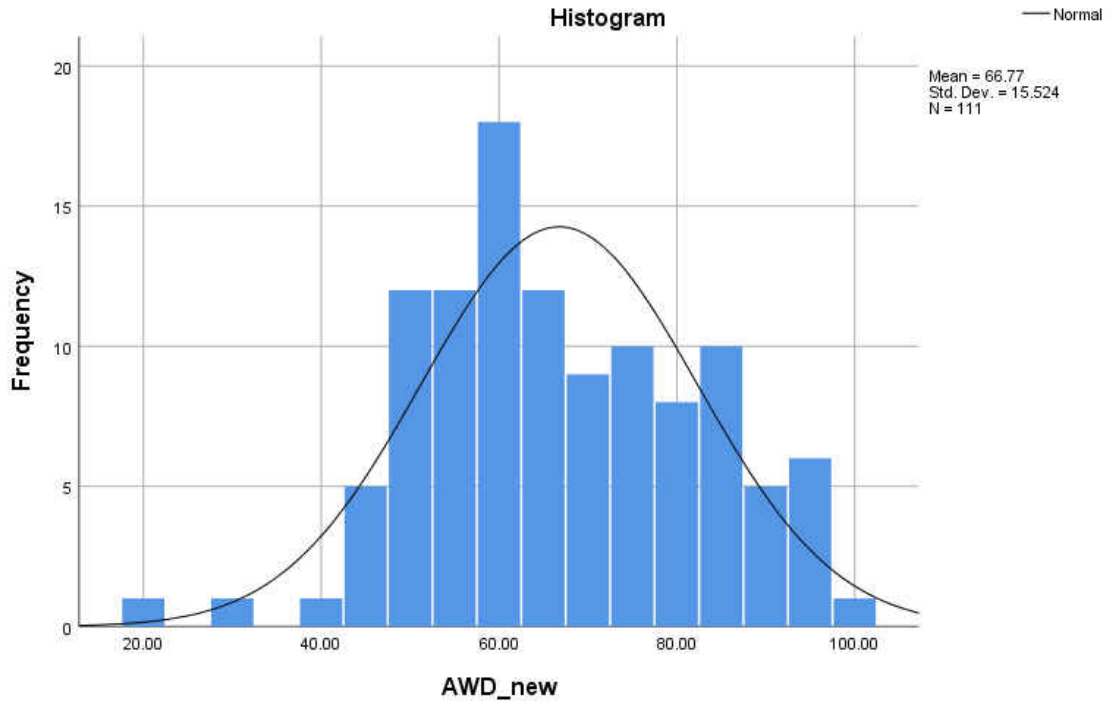


Figure 4. Histogram of Normality Test of the AWD

MLR assumes that the continuous predictor variables should moderately related (r > .2), but any correlation over .7 or .8 presents a concern for *multicollinearity*. Although there were

slightly significant correlations between *GRE writing scores* and *Motivation* (.216*), *GRE writing scores and AWD* (.134), and *Motivation and AWD* (-.030), those relationships did not reach or exceed .7 or .8 which means that the multicollinearity assumption was met for the continuous variables (see Table 8). The small correlations will be addressed in the main analysis. For the categorical variables, the assumption of multicollinearity was tested using Variance Inflation Factor (VIF) values. The VIF values for some categories of Gender and Race showed high collinearity in the initial analysis (discussed below); those variables were removed from the MLR analysis due to their statistically non-significant values, in addition to high VIF.

Table 8. Correlation (Pearson's r) between Outcome Variable and Predictor Variables

		AWD	GRE	Motivation
Pearson Correlation	AWD	1.000	.134	-.030
	GRE	.134	1.000	.216
	Motivation	-.030	.216	1.000
Sig. (1-tailed)	AWD	.	.080	.377
	GRE	.080	.	.011
	Motivation	.377	.011	.
N	AWD	111	111	111
	GRE	111	111	111
	Motivation	111	111	111

The *linearity* assumption states that there should be a linear relationship between the dependent variable (AWD) and the independent variables (Motivation and GRE writing scores). The scatterplot in Figure 5 indicated an almost linear relationship between AWD and Motivation; the small correlation makes the linear relationship difficult to see, but there is no reason to assume there is a different relationship between these variables.

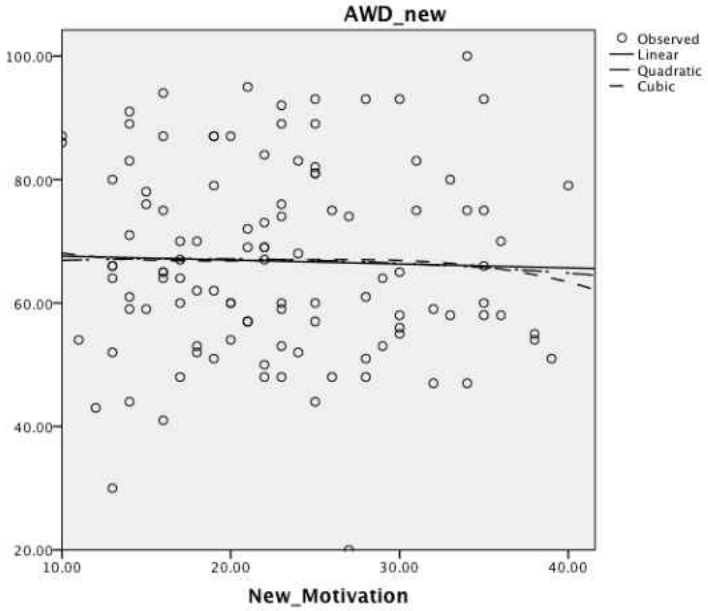


Figure 5. Linearity between AWD and Motivation

Figure 6 presents a graphic depiction of the weak linear relationship between AWD and GRE writing scores.

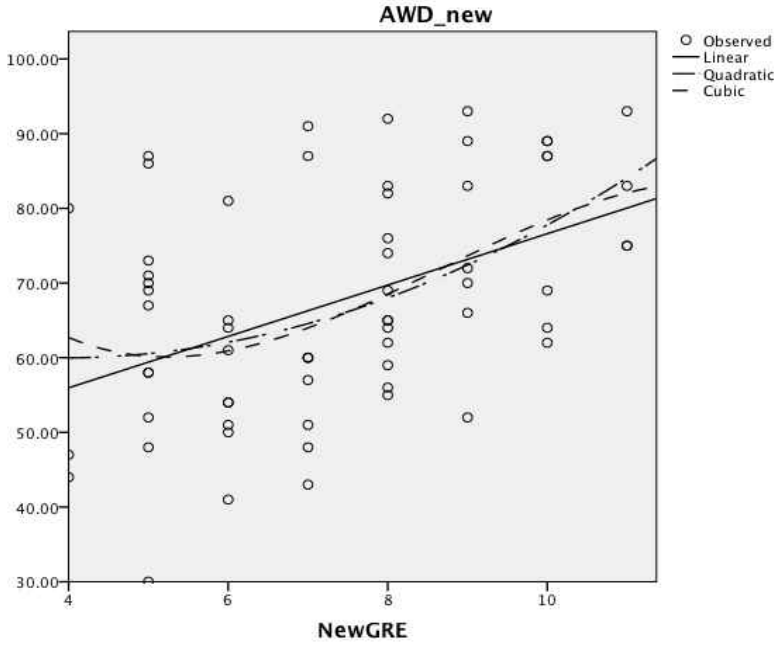


Figure 6.Linearity between AWD and GRE writing scores

The scatterplot in Figure 7 shows that none of the values of the Standardized Residual or the Standardized Predicted Values have z-score greater than +3 or less than -3, suggesting a multivariate linear relationship with no multivariate outliers. Figure 7 demonstrates also the *homoscedasticity* assumption of the DV data. The values of the Standardized Residuals are roughly equal across all values of the Standardized Predicted Values, rather than increasing or decreasing, suggesting that this assumption was also met.

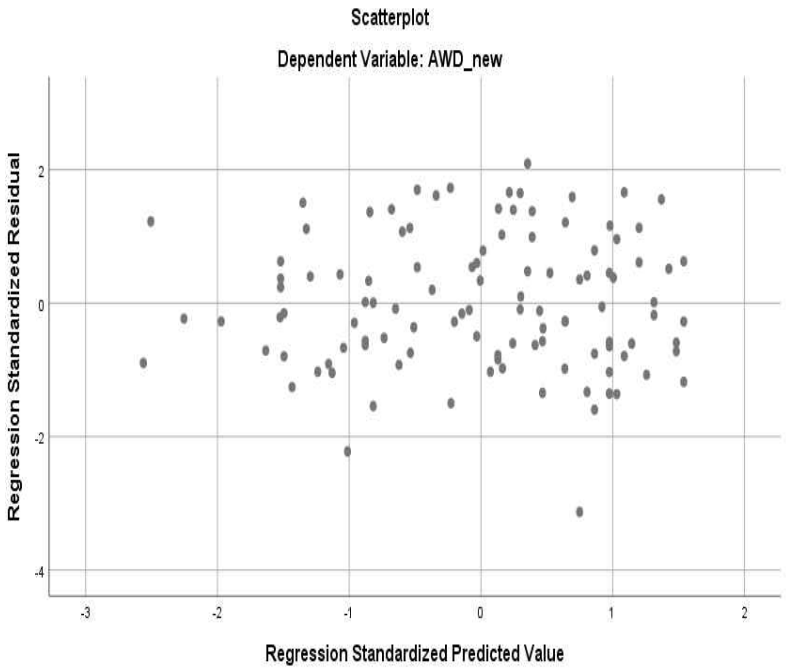


Figure 7. Outliers and Homoscedasticity of AWD

The final important MLR assumption to check was the existence of *multivariate outliers*. Multivariate outliers are cases that have an unusual combination of scores on at least two variables. Absence of multivariate outliers is checked by assessing Mahalanobis Distances among the participants. Mahalanobis distance is a measure of multivariate distance and provides a

conservative probability estimate for identifying an outlier when $p < .001$ for the chi-square value (Laerd Statistics, n.d; Pallant, 2013; Tabchnick et al., 2013). While MLR is robust to violations of normality, it can be sensitive to extreme cases. Therefore, it was necessary to identify and remove those extreme outliers (Fox, 1991; Allison, 1999).

In the current study, the researcher searched for multivariate outliers by running a multiple linear regression among the continuous independent variables (Motivation and GRE writing scores) and the dependent variable (AWD). Once the Mahalanobis values were calculated, they were sorted out from the greatest to least values. To identify an outlier, the critical chi square value must be known. This is derived from the critical chi square value at p = .001 with the degrees of freedom being the number of dependent variables (Pallant, 2013). In this study, MLR had 2 degrees of freedom meaning that the critical value was 13.82, so any value with a Mahalanobis Distance value greater than 13.82 should be removed. According to the Residual Statistics table, the maximum Mahalanobis Distance for MLR was 7.524 suggesting that there were no multivariate outliers for the MLR which means that this assumption was met.

MANOVA Assumptions

MANOVA has several important assumptions that needed to be checked which include *normality, linearity, multicollinearity, Equality of covariance matrices,* and *multivariate outliers.* Some of these analyses are identical to the assumption and calculation for MLR, discussed in the previous section, and will not be repeated in this section.

The Shapiro-Wilk *normality* results revealed that the assumption of normality was met for AWD, but not for the GRE writing scores or Motivation variables suggesting that the data of the GRE writing scores and Motivation variables were not normally distributed and thus there is a

partial violation for this assumption (Table 9, figures 4 above, and 8 and 9 below). However, MAVOVA is robust to violations of the normality assumption, so we continued with the analysis; however, the results were interpreted with caution.

Table 9. MANOVA's Normality Test

	Shapiro-Wilk		
	Statistic	Df	Sig.
GRE	.831	111	.000
Motivation	.964	111	.004
AWD	.979	111	.072

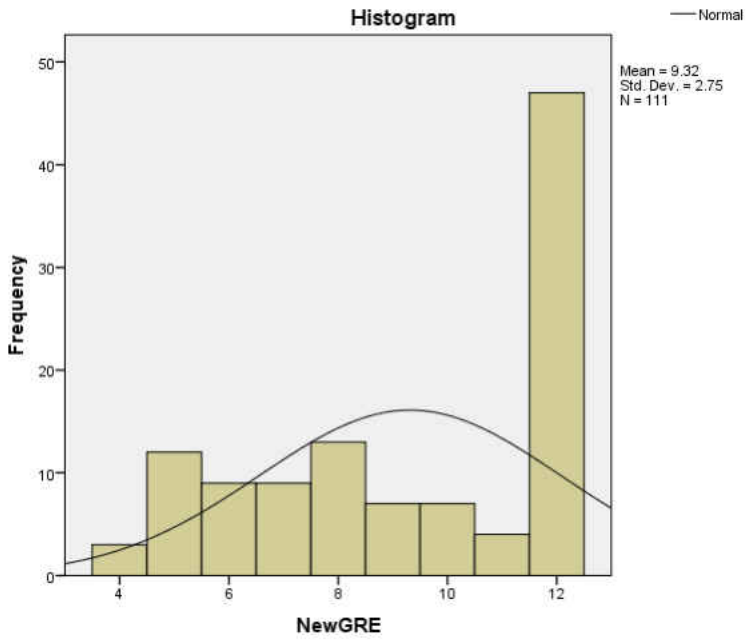


Figure 8. Histogram of Normality Test of the GRE writing scores

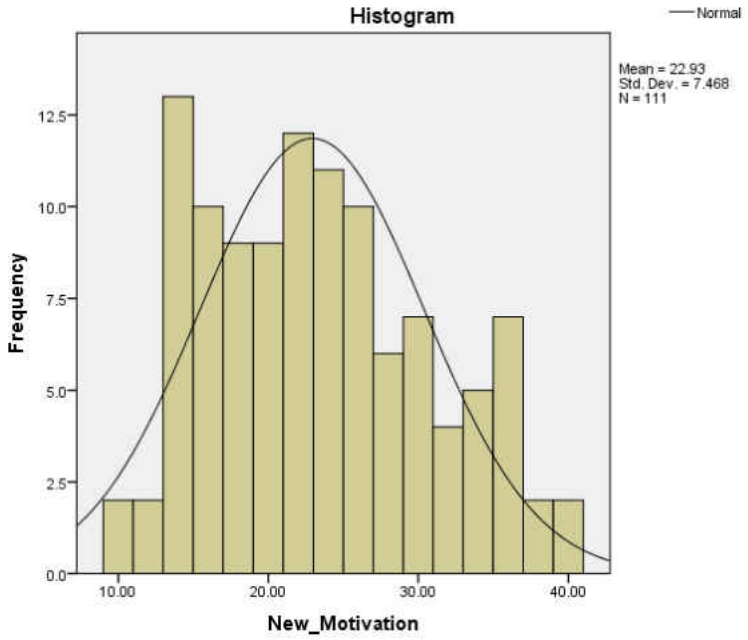


Figure 9. Histogram of Normality Test of the Motivation

The assumption of *Linearity* assumes that all dependent variables are linearly related to each other. The researcher checked this assumption by creating a scatterplot matrix between the dependent variables (GRE writing scores, Motivation, and AWD). Figure 10 presents a graphic depiction of a weak linear relationship among the dependent variables.

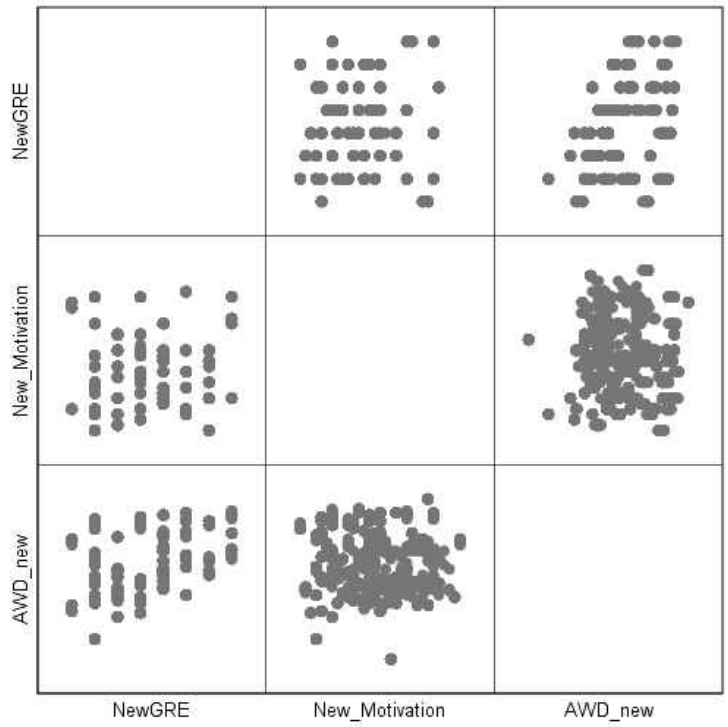


Figure 10. Linearity of Dependent Variables used in MANOVA.

Absence of *multicollinearity* assumption was already tested and presented above (see Table 8).

Equality of variance matrices assumption was used to test the null hypothesis that the observed variance matrices of the dependent variables are equal across groups. This assumption was checked by running a Box's M test. Unlike most tests, the Box's M test tends to be very strict, and thus the level of significance is typically .001 (Hair, 2010). For the current study, the p value for the test was significant (.000) which means the null hypothesis was rejected and the assumption was violated (Table 10). Unfortunately, Box's M test is especially sensitive to violations of normality and the analysis above already showed that these data were not normally distributed. In

addition, MANOVA is robust to violations of the equality of variance assumption. We proceeded with the analysis, but the results were interpreted with caution.

Table 10. Results of Box's M Test of Equality of Variance for MANOVA

Box's M	347.533
F	57.727
df1	6
df2	2771596.554
Sig.	.000

The last important MANOVA assumption to check was the existence of *multivariate outliers*. In the current study, the researcher searched for multivariate outliers by running a multiple linear regression among the dependent variables (GRE writing scores, Motivation, and AWD). The dependent variable was Status. Once the Mahalanobis variable was created, it was sorted out from the greatest to least values. To identify an outlier, the critical chi square value must be known. This is derived from the critical chi square value at p = .001 with the degrees of freedom being the number of dependent variables (Pallant 2013). In this study, MANOVA had 3 degrees of freedom meaning that the critical value was 16.27, so any value with a Mahalanobis Distance value greater than 16.27 should be removed. According to the Residual Statistics table, the maximum Mahalanobis Distance for MANOVA was 11.04 suggesting that no outliers was found for the MANOVA which means that this assumption was met.

MANCOVA Assumptions

The second research question of the present study required a comparison between the two groups of first year doctoral students on the combination of the dependent variables of Motivation, GRE writing scores, and AWD. The MANOVA results showed Motivation scores were not

statistically significantly different between the two groups. Therefore, MANCOVA was used as a *post hoc* analysis to control for GRE writing score and examine the differences of AWDs and Motivation scores between international and domestic students. Although a post hoc analysis, MANCOVA has several assumptions that needed to be checked before proceeding in the analysis, such as *absence of outliers, normality, linearity,* and *homogeneity of covariance.* Except for *homogeneity of covariance*, these assumptions were already checked for the other analyses, but in some cases the differences between the analyses required the assumptions to be re-checked.

The presence of multivariate outliers was tested using Mahalanobis distance. The multivariate outliers are observations that are inconsistent with the correlational structure of the dataset (Allen, 2017). In the current study, once the Mahalanobis variable was created, it was sorted out from the greatest to least values. To identify an outlier, the critical chi square value was compared to the critical chi square value at p = .001 with the degrees of freedom being the number of dependent variables (Pallant 2013). In this study, MANCOVA had 2 degrees of freedom meaning that the critical value was 13.82. According to the Residual Statistics table, the maximum Mahalanobis Distance for MANCOVA was 11.04 suggesting that there were no multivariate outliers for the MANCOVA. This assumption was met.

To test the *normality* assumption, the Shapiro-Wilk's table shows statistically significant results for the GRE writing scores (p = .000) and Motivation (p = .004), but not significant for the AWD (p = .072). The normality assumption was only met for AWD (Table 11). However, as already mentioned, MANCOVA is robust to violation of normality, so we proceeded with the analysis. Findings were interpreted cautiously.

Table 11. MANCOVA's Normality Test

	Shapiro-Wilk		
	Statistic	Df	Sig.
GRE	.831	111	.000
Motivation	.964	111	.004
AWD	.979	111	.072

As far as *linearity* between the dependent variables and the covariate is concerned, the assumption of MANCOVA's *linearity* was tested using the same scatterplot used for MANOVA's linearity (see Figure 11). The scatterplot illustrated a linear relationship for GRE writing scores and AWD, and GRE writing scores and motivation, but not between the AWD with Motivation. The same figure indicated that the DVs demonstrated fair or strong correlations between each other, in particular between GRE writing scores and Motivation, and AWD and GRE writing scores. A relatively weak correlation was found between AWD and Motivation.

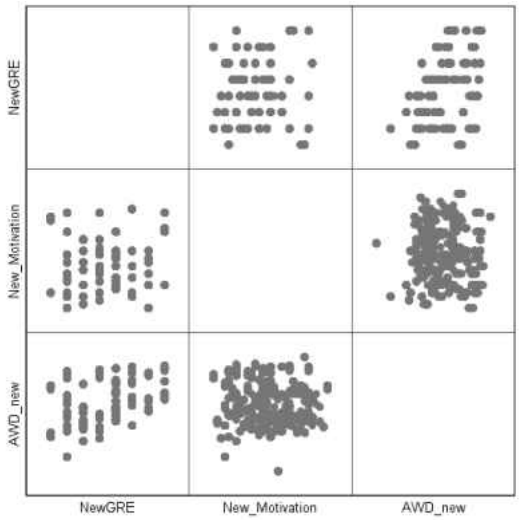


Figure 11.Linearity of Dependent Variables used in MANCOVA.

To assess the homogeneity of covariance matrices, Levene's test was used for each DV to test the equality of variance across the cells. When the IV was set as two groups of students, namely

the domestic and international, for answering the second research question, Levene's test indicated that the assumption of the equality of variances was met with *p* values larger than .05 for AWD (p = .011) and motivation (p = .186) (Table 12). Consequently, the requirements for equal variances between the DVs were fulfilled. Thus, Type I error is decreased from the results.

Table 12. Levene's Test with Two Doctoral Groups (Domestic and International)

	F	df1	df2	*P*
AWD	6.719	1	109	.011
Motivation	1.773	1	109	.186

In addition to Levene's test, Box's *M* test was used to test the equality of covariance matrices across the cells. The results of Box's M test were statistically non-significant at the .01 level (see Table 13), indicating that the null hypothesis of equal covariance matrices was not rejected.

Table 13. Results of Box's M Test of Equality of Covariance for MANCOVA

	Matrices
Box's M	7.235
F	2.331
df1	3
df2	25797.416
Sig.	.072

In sum, the homogeneity assumption was met, and the linearity assumption was partially violated for the dataset. Nonetheless, research has suggested that MANCOVA is robust to violation of assumptions except for the assumption of outliers, which was met (Salkind, 2010). Thus, it was still appropriate to continue with the MANCOVA as a *post hoc* analysis for research question two.

Data Analysis Procedures

Research Question One

The first research question and its sub question were addressed by conducting two Multiple linear regression (MLR) analyses to examine the factors that predict AWDs among first-year doctoral students in various fields. In both analyses, AWD was the dependent variable and Motivation, GRE writing scores, College, Age, Race, and Gender were the independent variables.

Two multiple regressions were conducted to determine the factors that best predict Academic Writing Difficulties, labeled as AWDs. The first analysis included all the predictor variables, significant and non-significant (Table 14), while the second, simplified analysis, included only the significant predictors (Table 15). The first regression equation with all variables included was significant, adjusted $R^2 = .301$, $F\ (21, 77) = 3.007$, $p = .000$. The adjusted R^2 effect size can be interpreted to mean that the variables included in this analysis account for 30.1% of the variance in self-reported academic writing difficulties. In this omnibus analysis, eight variables were statistically significant or almost statistically significant, in addition to the Constant: GRE writing scores, Asian (Race), Middle Eastern (Race), Business (College), Engineering (College), Science (College), "Fifty-Five to Sixty-Four" (Age), and Transgender Male (Gender)

Table 14.First MLR Model with all Variables

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	50.534	7.251		6.969	.000
(GRE Writing Scores)	1.145	.577	.214	1.983	.051
(Motivation)	.166	.198	.084	.838	.405*
(Race)					
Black African	-6.054	6.282	-.090	-.964	.338*
Asian	-8.781	4.217	-.213	-2.082	.041
Middle Eastern	-12.177	6.704	-.162	-1.816	.073*
Other Ethnicities	-5.164	6.871	-.069	-.751	.455*
Missing Values	-16.074	13.040	-.327	-1.233	.221*
(College)					
Arts	5.879	7.323	.078	.803	.425*
Business	17.562	8.360	.203	2.101	.039
Engineering	10.282	4.106	.262	2.504	.014
Other Colleges	-6.593	7.438	-.088	-.886	.378*
Science	8.048	4.233	.205	1.901	.061*
Missing Values	.957	4.500	.026	.213	.832*
(Age)					
18-24	6.932	4.738	.141	1.463	.148*
35-44	7.011	4.485	.143	1.563	.122*
45-54	4.606	4.913	.094	.938	.351*
55-64	26.829	6.840	.357	3.922	.000
(Gender)					
Male	-2.460	2.992	-.081	-.822	.413*
Transgender Male	28.086	13.206	.190	2.127	.037
Prefer not to Answer	-9.696	9.786	-.092	-.991	.325*
Missing Values	10.232	13.875	.199	.737	.463*

* Statistically non-significant ($p > .05$) factors that will be removed in the second analysis

To better model the factors that predict AWD, a second regression analysis was implemented by removing several items that were not statistically significant in the omnibus analysis. Those variables were removed to better understand the variables that best predict AWD. The second linear combination of the remaining variables was statistically significant,

adjusted R^2 = .250, F (5, 105) =8.334, p < .000. Based on the results of the second model (or *post hoc* Regression), Asian race, Colleges of Business, Engineering, and Science, and the Age of "fifty-five to sixty-four" were the best predictors of AWD, accounting for 25% of the variance of self-assessed AWD. GRE writing scores, participants who reported other Ages, participants who reported other Ethnicities, and participants who reported attendance in other Colleges offered little additional predictive power. (Table 15).

Table 15. Second MLR Model after Removing Non-Significant Factors

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	T	Sig.
(Constant)	63.507	1.694		37.492	.000
Asian	-11.112	3.834	-.246	-2.898	.005
Business	20.826	7.944	.219	2.621	.010
Engineering	9.643	3.694	.225	2.611	.010
Science	9.852	3.650	.230	2.699	.008
Fi5Si4	26.893	6.246	.361	4.305	.000

In interpreting the regression equation, it is important to remember that greater AWD scores mean that students found writing easier. The minimum score possible was 20 and the maximum score was 100. A score of 20 means that they scored every item as "extremely difficult" and a score of 100 means that they scored every item as "extremely easy." For Motivation, larger numbers mean that students were less motivated. The minimum score was 9 and the maximum score was 45. When we use this information to interpret the MLR regression equation, we can see that:

AWD = 63.507 + (-11.112 * Asian) + (20.826 * Business) + (9.643 * Engineering) + (9.852 * Science) + (26.893* Age- "55-64")

This can be interpreted to mean that a "typical" first-year doctoral student at UCF reported an AWD score of 63.507 on the measure used. If a student was Asian, his/her typical score is reduced by 11 points, meaning that he/she finds academic writing more difficult. Students in one of three Colleges, Business, Engineering, or Science, reported higher AWD scores by 20.8, 9.6, and 9.9 points, respectively. This means that students in those Colleges typically reported finding AWD easier (less difficult). Finally, students who were between the ages of 55 to 64 reported much higher AWD scores, 26.9 points, meaning that they found writing much easier (less difficult). All of this also means that for this study's sample, all of the other variables did not predict AWD: GRE writing scores, Motivation, other Races, other Colleges. other Ages, or any Gender.

Research Question Two

Multivariate Analysis of Variance (MANOVA) was used to analyze the data obtained to answer the second research question. MANOVA was used to measure the mean differences for three dependent variables (*Motivation*, *AWDs*, and *GRE writing scores*) between the two subgroups of *Status* (international and domestic). All the MANOVA assumptions were checked previously. Even though linearity and normality assumptions were partially violated, MANOVA is robust to violations of these assumptions. Pillai's Trace was the most appropriate test statistic to interpret because it is the most robust to violations of assumptions.

Results of Pillai's Trace test indicated that there was a statistically significant difference across the levels of the independent variable on a linear combination of the dependent variable. Pillai's Trace $F = 13.509$, $p < .000$, $\eta^2 = .275$. The value of η^2 suggests a very large effect size (Cohen, 1988).

The researcher analyzed the tests of between-subjects effect to determine how the dependent variables differed for the independent variable. Tukey's test results are presented in Table 16 and they show how MANOVA tested the difference of scores for AWD, Motivation, and GRE writing scores between the two groups of first-year doctoral students, domestic and international. The results demonstrated statistically significant differences for the AWD ($p = .000$) and GRE writing scores ($p = .000$) between domestic and international students. However, no statistical difference was found between the two groups in terms of Motivation ($p = .246$) (see Table 16).

Table 16. MANOVA's Results

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected	GRE	110.384[a]	1	110.384	16.674	.000
Model	Motivation	75.676[b]	1	75.676	1.361	.246
	AWD	3829.019[c]	1	3829.019	18.403	.000
Intercept	GRE	5601.122	1	5601.122	846.090	.000
	Motivation	41542.920	1	41542.920	747.255	.000
	AWD	295963.001	1	295963.001	1422.467	.000
Status	GRE	110.384	1	110.384	16.674	.000
	Motivation	75.676	1	75.676	1.361	.246
	AWD	3829.019	1	3829.019	18.403	.000

Table 17. GRE writing scores, Motivation, and AWD for both Groups

	Status	Mean	Std. Deviation	N
GRE	1	9.84	2.396	87
	2	7.42	3.147	24
	Total	9.32	2.750	111
Motivation	1	22.4943	7.22379	87
	2	24.5000	8.26727	24
	Total	22.9279	7.46837	111
AWD	1	69.8506	15.20597	87
	2	55.5833	11.02139	24
	Total	66.7658	15.52356	111

Due to the non-significant results of the motivation between domestic and international students, a MANCOVA was conducted as a *post hoc* analysis in which GRE writing scores were controlled for to examine the mean differences between domestic and international students' motivation for academic writing and their AWD scores.

For this analysis, the group variable, namely IV, was Status (domestic =1, international = 2); the DVs included two continuous variables, AWD and motivation, and GRE writing scores were used as a covariate. Results of the multivariate tests demonstrated statistically significant difference in motivation between domestic and international students F (1) =4.921 p < .001, η^2 = .164. There was also a statistically significant difference in AWD between both groups, F (1) =15,957, p < .001, η^2 = .164. Wilk's Lambda was used to interpret the effect size for both DVs and it was moderate to large (η^2 = .164) (see Table 18).

Table 18. MANCOVA's Results

Tests of Between-Subjects Effects					
Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F
Corrected Model	Motivation	541.746[a]	2	270.873	5.230
	AWD	3829.515[b]	2	1914.758	9.119
Intercept	Motivation	2355.764	1	2355.764	45.484
	AWD	34021.051	1	34021.051	162.016
GRE	Motivation	466.070	1	466.070	8.999
	AWD	.496	1	.496	.002
Status	Motivation	254.889	1	254.889	4.921
	AWD	3350.635	1	3350.635	15.957
Error	Motivation	5593.678	108	51.793	
	AWD	22678.394	108	209.985	
Total	Motivation	64487.000	111		
	AWD	521309.000	111		
Corrected Total	Motivation	6135.423	110		
	AWD	26507.910	110		

When interpreting the results of the MANCOVA, three things should be kept in mind: one, the higher Motivation scores mean that students were less motivated, the larger AWD scores mean that students found writing easier, and only mean scores were used to interpret the results. According to this information, Table 19 indicated that international students (μ=22.49) were slightly less motivated for writing than domestic students (μ=24.50). The results also showed that AWDs among domestic students were higher (μ=69.85) than those among international students (μ=55.58) suggesting that AW was easier for domestic students (less difficult) compared to International students.

Table 19. Test of Between -Subjects Effects for Status

Dependent Variable	Domestic		International		*Df*	*F*	*P*	Sig	η2
	M	SD	M	SD					
Motivation	22.49	7.22	24.50	8.26	109	1.76	<.001	.029	.164
AWD	69.85	15.20	55.58	11.02	109	5.78	<.001	.000	.164

However, because of the unequal variances between the DVs that were mentioned previously, the inferential findings should be interpreted cautiously. Hence, mean differences revealed through descriptive statistics (Table 19) were examined to complement the findings.

Conclusion

In sum, Chapter Four presented the results of statistical analyses that examined 1) the factors that best predicted AWDs among first-year doctoral students, 2) mean differences between domestic and international first-year doctoral students in terms of AWDs, Motivation and GRE writing scores. An MLR analysis was conducted with AWD as the DV, and Motivation, GRE writing scores, College, Race, Age, Race, and Gender as IVs. The results of the linear Regression revealed that Asian race, Colleges of Business, Engineering, and Science, and the Age of fifty-five to sixty-four were the best predictors of AWD, with Age and Race offering little additional predictive power.

For RQ2, a MANOVA was conducted with Status as the IV and AWD, motivation, and GRE writing scores as DVs. The results revealed that there were statistically significant differences in the AWD and GRE writing scores between domestic and international students. However, no statistical difference has been found between the two groups in terms of motivation. Because of the non-significant results of the motivation between the two groups, a MANCOVA

was implemented as a *post hoc* analysis for RQ2's data where GRE writing scores were controlled for to see if there was a statistically significant difference in motivation between the domestic and international students. The results of the MANCOVA revealed that the IV, *status*, had a statistically significant effect on motivation (.029) and AWD (.000) between the two groups of doctoral students when the GRE writing scores were controlled for.

CHAPTER FIVE: DISCUSSION

Purpose of the Study

The present study aimed to understand the factors that predict AWDs among first-year doctoral students by focusing not on one sample of international students in an EFL context, as many prior studies have done, but rather on a homogenous population that included both domestic and international first-year doctoral students in an ESL context. According to recent discussions on AWDs, a great attention was placed to research writing challenges among international graduate students compared to those faced by domestic students (Campion, 2016; Imani & Habil, 2012; Paltridge, 2018; Ravichandran et al., 2017). Therefore, investigating AWDs among domestic students along with the international students was an intentional attempt to keep the searchlight aimed on AWDs among both groups domestic and international students (Brown, 2017; Findlay, 2018; Kamler, & Thomson, 2008; McAlpine, & Amundsen, 2011).

Furthermore, most of prior AWD research was qualitative. A search of the literature reported in Chapter 2, found no quantitative research on the factors that predict AWDs among first- year doctoral students. Hence, the quantitative focus for this research was directed towards identifying the influential factors that best predict AWDs in order to improve the university-wide writing services provided for first-year doctoral students, both international and domestic.

Along with the novelty of using two multivariate analyses as methods for assessing and comparing predicting factors of AWDs, the researcher also sought to create a model from the interaction of several different factors, such as GRE writing scores, Motivation, and other demographic factors, that would capture as exclusively as possible AWDs among first-year doctoral students. All too often AW research investigated one factor with one group of students at

a time in relation to either AW or AWDs. None of it has examined multiple factors that predict those difficulties at the same time with two groups. To this end, the instrument utilized in the current study was based on several scales that were used to assess AWDs among students. Also, by using multiple scales, it was hoped to collect as much data as possible about students' demographic information to be able to identify the variables that best predict AWDs.

Summary of the Findings

Data were collected from first-year doctoral students, domestic and international, during the Summer semester of 2019. Domestic students were chosen based on their residency and their first language and the same criteria have been used to select international students. All doctoral students demonstrated advanced English proficiency; in addition, although their ages varied, they had similar degree levels in the university. We had responses from students in most of the academic Colleges, however, some had so few responses that it prevented detailed analysis.

Before conducting the analyses, all data were entered, screened, and missing data were imputed. Preliminary analyses were done to calculate the descriptive results including both demographic and continuous variables. Reliability of AWD and Motivation scales were verified through Cronbach's alpha; the reliability of those scores was improved by removing items that did not seem to be measuring the intended variables. The data were analyzed using multiple linear regression (MLR) and MANOVA to answer the research questions. Subsequently, GRE writing scores was used as a covariate in the MANCOVA to strengthen the results of the MANOVA. The three analyses were used to analyze data obtained from the following research questions:

1. Are motivation for academic writing, College of study, GRE writing scores, gender, race, and age statistically significant predictors of self-reported academic writing

difficulties among first-year doctoral students at a large, public University in the Southeastern United States?

a. How much of the variance in self-reported writing difficulties is explained by motivation for academic writing, College of study, GRE writing scores, gender, race, and age?

2. Are there statistically significant differences between international and domestic students in their levels of motivation for academic writing, self-reported writing difficulties, and GRE writing scores?

Research Question One

The first research question targeted the factors that may predict AWDs among first-year doctoral students. Two Multiple Linear Regression (MLR) analyses were used to examine the prediction relationships between the DV, AWD, and the IVs, motivation, GRE writing scores, college, age, race, and gender. The first regression equation was statistically significant (adjusted R^2 = .301, F (21, 77) = 3.007, p = .000). It was found that 30.1% of the variance in academic writing difficulties was accounted for by the linear composite of the predictor variables. This model included all the variables as IVs, both statistically significant and non-significant (Table 14).

The second regression analysis was carried out by removing several statistically non-significant factors to better understand which variables were the best predictors of AWDs. The second linear combination was also significant (adjusted R^2 = .250, F (5, 105) =8.334, p < .000), with 25% of academic writing difficulties variance was accounted for by the linear composite of the predictors (Table 15). Based on the results of the second model (or *post hoc* Regression), which

included only the statistically significant predictors, first-year doctoral students who reported being of Asian race, students who reported being in Colleges of Business, Engineering, or Science, and students who were of ages between fifty-five to sixty-four were statistically significant predictors of AWDs. Just as important, students' self-reported motivation, students who reported being in other age ranges, other Colleges, and other ethnicities were not statistically significant predictors and offered little additional predictive power of AWDs.

Research Question Two

The second research question examined the mean differences between international and domestic students in three variables: Motivation for academic writing, AWD, and GRE writing scores. The results of the MANOVA indicated that there were statistically significant differences in the AWD and GRE writing scores between domestic and international students (AWD F (1) =18.403, p < .000; (GRE writing scores F (1) =16.674, p < .000). However, no statistically significant difference has been found between the two groups in terms of Motivation (F (1) =1.361, p < .246). The non-statistically significant result of motivation was not surprising since both groups are doctoral students, so they were presumably motivated to pursue their doctoral fields and writing is part of earning a doctorate.

Despite the reasonableness of the statistically non-significant difference of Motivation between the two groups, the correlation between GRE writing scores and AWDs suggested the value of examining whether there was a statistically significant difference in Motivation between domestic and international students when GRE writing scores were controlled. A MANCOVA was used as a *post hoc* analysis to check this emergent hypothesis. The results of the MANCOVA revealed a statistically significant difference in Motivation between domestic and international

students (F (1) =4.921 p < .001, η^2 = .164) when GRE writing scores were used as a covariate. The same analysis revealed that there was a statistically significant difference in AWDs between both groups (F (1) =15,957, p < .001, η2 = .164) when GRE writing scores were used as a covariate. Wilk's Lambda was used to interpret the effect size for both DVs and it was moderate to large (.164).

The *post hoc* test from the MANCOVA was also interpreted. Between-subjects effects for the IV, *Status*, had a statistically significant effect on Motivation (F (1) =4.921 p < .029) and AWDs (F (1) =15.957 p < .000) when the GRE writing scores were controlled, contributing to the significance.

Because of the unequal variances between the DVs that were mentioned previously, the inferential findings should be interpreted cautiously. Hence, mean differences revealed through descriptive statistics were examined to complement the findings. Although both DVs were showed statistically significant differences, there was more difference between the two groups in the AWDs than in Motivation. Means scores indicated that international students (μ=22.49) were slightly less motivated for writing than domestic students (μ=24.50). In addition, AWDs among domestic students were higher (μ=69.85) than those among international students (μ=55.58) suggesting that domestic students find academic writing easier.

Discussion of the Findings

This study was the first to explore how multiple factors predict AWDs among first-year doctoral students simultaneously and the first to compare AWDs between domestic and international first-year doctoral students. As such, the findings from this study will be compared to multiple areas of prior research. The discussion of the findings will be divided into three sub-

sections, noting how the findings corroborate prior research results, how the findings are different than prior research results, and finally how these findings add to topics not previously studied.

Results Consistent with Prior Research

Overall the results of this study were consistent with relatively few of the prior studies, mostly due to differences in how AWDs were measured and the differences in sampling methods; these differences are discussed in more detail in the next section.

The first research question revealed the factors that best foretold AWDs among first-year doctoral students. The results of the MLR revealed that Asian race, Colleges of Business, Engineering, and Science, and the Age of fifty-five to sixty-four were the best predictors of AWDs.

As it was mentioned in chapter two, United States Census Bureau (2017) considers Asian race as one of the main eight races in the United States. However, For the sake of this study, "Middle Eastern" was added as an option for "Race" because of its educational importance in doctoral education. Geographically, the countries that comprise the "Middle East" are spread across three continents: Southern Europe, Northern Africa, and parts of Southwest Asia (Parvini & Simani, 2019). Although Middle Eastern students are considered White in terms of race (United States Census Bureau, 2017), centuries of religious differences have led many people of Middle Eastern ancestry to not identify themselves as "racially" White, but as Asian. Because of the large proportion of doctoral students studying in the US from this region and the cultural and linguistic differences they bring to that education, it was an important group to distinguish for the sake of this study. According to these considerations, the significant finding of the Asian race in this study is discussed and compared to other studies' results where the sample is Middle Eastern Asian students.

In terms of Race, the significant result of the Asian race being as a predictor of AWDs is in accordance with the findings of Al Morshedi's research (2011) who carried out a mixed-methods dissertation study that aimed to examine cultural and academic difficulties among Emirati and Saudi students at U.S. universities. Although the survey results indicated that students' gender and linguistic problems in English did not impact their classroom participation, the interviews showed that due to their low proficiency in English, students experienced literacy problems especially in writing. The findings of a more recent study by Al Murshidi (2014) on the AWDs faced by Emirati and Saudi students at various US universities also demonstrated that less than 31% of students felt comfortable while using academic writing in English as a second language due to linguistic and sociocultural challenges in the hosting country.

The analysis for the Second Research Question found that there were statistically significant differences in the AWDs and GRE writing scores between domestic and international students; however, regarding Motivation, the two groups of doctoral students were not statistically significantly different. Yet, by using the GRE writing scores as a covariate in a *post hoc* MANCOVA, the results revealed a statistically significant difference in Motivation between domestic and international students, in addition to the statistically significant difference in AWDs.

Although the results revealed a statistically significant difference between domestic and international students' Motivation, when compared to domestic students, international students were slightly less motivated for writing. This might be attributed to the EMs that international students were targeting or expecting, such as earning a higher position, more money, and/or other people's respect. The Motivation result supports Deci et al.'s study (1999), who conducted a meta-analysis of 128 studies to examine the negative effects of extrinsic reward types on intrinsic

motivation (IM). The findings revealed that any kind of EM, represented by tangible and expected rewards undermined all types of IM among students including free-choice IM and self-reported interest. The Motivation result was also in line with those of Vansteenkiste et al.'s study (2006), which examined the intrinsic versus extrinsic goal framing of certain tasks under the contextual factors of autonomy vs. controlling by manipulating the instruction wording from an autonomy-supportive language, such as "can you…" to a more controlling-like language as in "you should…". Vansteenkiste et al. found out that self-choice-supportive language instructions (IM) led to better performance and learning experience than the controlling language instructions (EM). That is, students with intrinsic goal framing developed deeper processing in the sense that their test free-choice persistence and performance have been greater in the intrinsic- goal context than those of the students with the extrinsic-goal context. Also, students who were exposed to the autonomy-supportive language showed increased deeper processing in the test performance and persistence compared to their counterparts who were exposed to the controlling language.

Results Different than Prior Research

Although the results of the present study might have some similarities to the findings of several prior articles as mentioned above, they were also different from the results of the previous studies because of the different sampling method and the different approach used to measure AWDs. For example, for the AWDs results between both groups, the findings indicated that AWD scores among domestic students were higher than those from international students suggesting that domestic students found AW *easier* than their international counterparts. This result is different from that of Öztürk, & Köse's (2016) study, who conducted a corpus-based study to examine the difference in use of lexical bundles in the field of foreign language teaching in the writing of native

English students, native English scholars, and Turkish graduate students. The comparison was administrated based on the graduation theses and dissertations of Turkish students and scholarly published papers of native English students. While this study was much more narrowly focused, it suggested that Turkish graduate students had less AWDs compared to native English speakers.

The difference between this study and others was not only based on the findings level, but also on the setting, population, and methods used to collect and analyze the data, such as conducting studies about AWDs in an EFL setting with one sample using qualitative or mixed methods techniques. For instance, Gurel (2010) investigated, in his mixed methods study, the sociocultural and linguistic difficulties in the writing process of dissertations in English as a Foreign Language, and the strategies employed to overcome those challenges among Turkish doctoral students in various engineering fields in Turkey. The difficulties were classified as attitudinal issues, cognitive issues, linguistic issues, and sociocultural issues. However, this study addressed AWDs quantitatively in the assignments of two first year doctoral student samples, domestic and international at a US university (ESL context).

Results' Addition to New Research

Being different, however, is not a bad thing. It actually underlines the uniqueness of this study's findings which potentially add directly to research in the fields of TESOL and SLW by providing a comprehensive study about writing difficulties in relation to graduate level students who might be neglected by writing support centers in universities. Moreover, most prior research on AWDs in an ESL setting has been limited in two ways: first, most studies have examined the influence of a single variable on AWDs or only a single, narrow aspect of AW in English; second, most of that research has looked at international graduate students in isolation and has not

compared them to domestic graduate students. The current study addressed both of these weaknesses in previous studies by examining the influence of multiple variables on AWD– including Motivation, GRE writing scores, and various demographic variables–between first-year international doctoral students and their domestic counterparts. Moreover, using multiple quantitative multivariate relation analyses, instead of usual qualitative analyses methods allowed for the collection of data from a much larger sample than most of the qualitative studies letting us see patterns and differences that could not be seen in smaller samples. Subsequently, through statistical analyses implemented on top of the descriptive statistics, the results identified several predictor factors of AWDs, and statistically significant differences in the GRE writing scores, Motivation and AWDs between domestic and international doctoral students. While the statistical differences between the two groups in AWDs shed light on how domestic students were more comfortable with doctoral academic writing than their international counterparts, the differences in Motivation revealed that international students' external motives overweighed their internal motives.

Significance of the Findings and Pedagogical Implications

This section will address contributions and the pedagogical implications of the current study. The main contribution of the current study is that it provided a thorough and systematic investigation about predictors of AWDs among first-year doctoral students as well as comparing international and domestic students in terms of Motivation, AWDs, and GRE writing scores. Hence adding to the body of knowledge by understanding various kinds of academic writing difficulties. It also showed how GRE writing scores, Motivation and AWD were different between domestic and international first-year doctoral students. Thus, this multi quantitative research

contributed to existing research in the field TESOL by using a "composite" measure of AWD instead of a measure of AWD that only focused on one narrow aspect of writing, the use of multiple predictor variables instead of just one, and combining international and domestic students in the same sample, which allowed the researcher to see what was different and what was the same among international and domestic students. Additionally, this study was the first to explore factors that predict AWDs of doctoral students during their first year in their doctoral programs, a critical period influencing whether doctoral students will pursue the doctoral program or not.

In sum, the importance of the findings in the current study lies in providing empirical evidence for pedagogical materials' designers and instructors in various academic doctoral programs to realize what exactly international students might not be able to perform when compared to domestic students. Furthermore, the findings presented various kinds of AWDs among doctoral students, which could assist university administrators in gaining a better idea about what writing help those students needs and working on tailoring them. Thus, the findings call for a more diverse instruction in academic writing through different academic fields and adjust instructional strategies and assignments according to students' needs.

The educational and pedagogical implications of this study are based on the findings of the current study and considerations from previous research. These included instruction, curriculum, and university's administration decisions.

In terms of instruction, the results of the present study can play an important role in helping new or less-experienced graduate instructors to better understand the AWDs of students who struggle in their coursework in order to improve their academic writing preparing them for more difficult assignments and different writing genres during their coursework. In this sense, Asian

students need more support with academic writing, as do students in the College of Engineering; students in Business and Science need less support. The results of the current study will also assist instructors to better analyze their students' individual differences and needs in academic writing, identifying the difficulties among students, tailoring and improving lesson plans, and providing them with effective feedback to enhance their academic writing production (Dörnyei, 2014; Gregersen & MacIntyre, 2013). International doctoral students especially need greater support to understand the importance of academic writing in English to improve their motivation.

Regarding curriculum, given the increasing number of domestic and international graduate students studying at US universities, the findings of this study yielded important information for faculty in various doctoral programs about those students' writing proficiency level in order to modify first-year curricula to meet their needs. Those needs are greater for international graduate students who hold different educational traditions from their countries; which requires graduate instructors therefore to pay more attention to their AWDs and facilitate writing assignments to increase their motivation for writing.

With respect to administration decisions, the results of this study will provide university administrators with an insight about doctoral students' AWDs and shed light on how they can be minimized by for example funding specialized academic writing training workshops for first year doctoral students in various fields. In addition, hiring native graduate faculty in the university writing center to specifically help doctoral students in improving their AW would be another useful step in reducing the stress those students suffering from on the one hand and teaching them the writing conventions of academic writing on the other hand. It is also expected that other

universities and university writing centers will be interested in the findings to better understand the writing difficulties experienced by first-year doctoral students.

Study Limitations

The designs of the study imposed several limitations that were important to consider when interpreting the findings. First, the focus of the present study was directed only at first-year doctoral students, domestic and international, studying in a variety of doctoral programs. The study did not include undergraduate, master's or advanced doctoral students. In addition, the use of self-reported data, especially self-assessed writing difficulties, is another limitation since it is a subjective method of expressing participants' experience. Second, even though the instrument sought responses about variety of writing genres, such as: book reviews, literature review, grant proposals, and research proposals, the response rates on those items were very low, and this is a limitation of the research. Third, although all sub-scales of the questionnaire measuring AWD had been validated by previous research, these items had not been used together in a composite measure of AWDs. While some steps were taken to assess the validity and reliability of this composite measure of AWD, the instrument has not undergone a comprehensive assessment of its validity. Fourth, even though the study was confined to first-year doctoral students at one large university, the generalizability of survey results to all first-year doctoral students in the United States is not possible. In addition, the response rate across various doctoral programs was uneven, suggesting the possibility of a sampling bias. The last limitation is related to the sample size in general and sub-samples in particular. Although this study's sample size was not that small, it would have been nice to have a larger sample in total, and it was more important to have adequate sub-samples for

the various sub-populations of doctoral students to have enough statistical power to detect moderate and small effect sizes.

Recommendations for Further Research

The results of the present study can serve as a fertile ground for further exploring the AWDs among doctoral students and how they can be more motivated to improve their writing. Recommendations for further research to increase the understanding of AWDs among first year doctoral students can include expanding both the depth and width of the current research.

To deepen the scope of the current study, replicating the study with a mixed method research could be one promising aspect for the future research since qualitative approaches can be advantageous in examining the educational backgrounds of international doctoral students. Understanding the educational setting in which those students learned English in their native countries could be beneficial for further analyzing the reasons behind AWDs among this group, and subsequently helpful in interpreting the results when international doctoral students are compared to their domestic counterparts. Observations, interviews, and journals would be among the well-known qualitative approaches that are used for exploring such insights. Moreover, having another quantitative data collection method other than self-reported data, which has been used in this study, can be useful in identifying new predictors for AWDs such as Transfer, EAP courses, composition courses, etc., and recognizing how domestic and international students are different from each other under these variables within the same context. Analyzing texts written by first-year doctoral students, in terms of mechanisms, style, and idea organization, might reveal deeper and clearer idea on specific writing issues among students.

To broaden the scope of the current study, suggestions for further study would be recruiting a bigger sample of doctoral students and follow their academic writing production during the whole Ph.D. phase (longitudinal study). A larger sample size may provide more useful information to the area of study. This study examined 111 first-year doctoral students attending a large-publicly funded research university in the Southeastern of U.S., future studies can examine more doctoral students, domestic and international and do comparative studies on their AWDs using the same instrument of this study or a different one.

The current study only examined AWDs in relation to Motivation, GRE writing scores, and several demographic variables that were mostly not significant between domestic and international students, which is far from sufficient to cover other predictors of AWDs. Hence, conducting a more detailed analysis in terms of students' prior education in the native country or possible EAP/composition courses that might have been taken before starting the Ph.D. will provide more descriptions about learners' writing capabilities and help to more in devising precise pedagogical solutions. With the increasing number of doctoral students studying in U.S. universities, it seems necessary to include in future studies similar samples from other universities from all over USA in order to have a better idea about AWDs in the whole country and to compare the quality of services that the writing support centers provide for doctoral students. This will also help with increasing the generalizability of the survey results to all first-year doctoral students in the United States.

Investigating other genres of academic writing is another aspect that need more detailed exploration. As it has been mentioned previously, AW includes other genres as well, such as publication writing, grants writing, and dissertation/ thesis writing. Therefore, first-year writing

assignments, which was examined in the present study, solely represents academic writing. Finally, some aspects of AW that have been studied in prior literature were not included in the present study due to practical difficulties of time and space. For example, the process of AW, strategies used to overcome AWDs, and cultural difficulties while writing in an ESL/EFL setting are regarded as important facets for evaluating AWDs, however, they were not included in this study. Hence, assessing other critical aspects of AW can be useful for revealing more challenges among of doctoral students in academic writing.

Although Age is a critical variable to think about when it comes to studying a Ph.D., prior research about age of doctoral students and their AW is so scarce that only one study was found by the researcher. Therefore, further investigations are needed regarding the relationship between this demographic variable and AWDs. Related to this is the writing issues that nontraditional students have when they come back to school after many years of work loaded with family and personal responsibilities (Tripp, 2018). Again, existing research on this issue is rare and need to be expanded in many directions, such as discussing the role of writing centers where nontraditional students gain their writing confidence again and learn how to use the writing conventions correctly.

Conclusion

The present study examined AW of domestic and international first year doctoral students, focusing on the factors that predict AWDs among them and how the two groups are different from each other in terms of Motivation, AWDs, and GRE writing scores. The first quantitative analysis revealed several important factors that predict AWDs.

The findings of the comparison analysis revealed statistically significant differences in the GRE writing scores and AWDs between domestic and international doctoral students, but not in Motivation. However, the results of the post hoc analysis showed a statistically significant difference between the two groups when the GRE writing scores were controlled for. The findings demonstrated that first-year doctoral students who reported being of Asian race, students who reported being in Colleges of Business, Engineering, or Science, and students who were of ages between fifty-five to sixty-four were statistically significant predictors of AWDs. However, students' self-reported motivation, students who reported being in other age ranges, other Colleges, and other ethnicities were not statistically significant predictors and offered little additional predictive power of AWD scores. In addition, the results indicated also that international students were relatively less motivated to write than domestic students and that their motivations were more extrinsic in nature than intrinsic. Moreover, domestic students faced relatively less AWDs than their international counterparts, which suggested that domestics found AW of assignments easier to perform than international students do.

APPENDIX A: CONSENT FORM

EXPLANATION OF RESEARCH

Title of Project: An Investigation of Factors Predicting Academic Writing Difficulties among First-Year Doctoral Students
Principal Investigator: Iman Ibrahim Khudhair, M.A.
Other Investigators: Florin Mihai, Ph.D.
Faculty Supervisor: David Boote, Ph.D.

You are being invited to take part in a research study. Although your participation is voluntary, your responses, if you do take part, are extremely important to the outcomes of the study.

- The purpose of this research is to investigate the factors that predict academic writing difficulties among first-year doctoral students. We will also compare academic writing difficulties between international and domestic first-year doctoral students.
- You will be asked to participate in an anonymous survey that includes a series of questions about academic writing. There are also a few Demographic questions that we would like you to answer. Please be assured that your answers will be kept completely anonymous.
- Completing the survey will take about 20 to 30 minutes. You may choose the time and place you complete the survey.

You must be **18 years of age or older** to participate in this study. You also must be a first-year doctoral students, whether international or domestic. You have the right to withdraw at any point during the study, for any reason. Your participation in this research is voluntary. Not participating will not hurt you in any way.
Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints: Iman Khudhair, Graduate Student, TESOL Track of College of Community Innovation and Education, (407) 435-5471 or by email at imanibrahim58@knights.ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved to be exempted from IRB review unless changes are made. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

APPENDIX B: IRB LETTER OF APPROVAL

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Determination of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Iman Ibrahim Khudhair Mrs.**

Date: **November 01, 2018**

Dear Researcher:

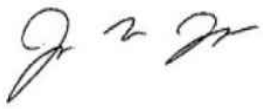
On 11/01/2018, the IRB reviewed the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Project Title:	Investigating Factors Predicting Academic Writing Difficulties Among First-Year Doctoral Students
Investigator:	Iman Ibrahim Khudhair Mrs.
IRB Number:	SBE-18-14499
Funding Agency:	
Grant Title:	
Research ID:	N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

This letter is signed by:



Signature applied by Racine Jacques on 11/01/2018 01:24:37 PM EDT

Designated Reviewer

APPENDIX C: SURVEY QUESTIONS

Dissertation Survey

Q1.1 Welcome to the research study!

You are being invited to take part in a research study. Whether you take part is up to you. The purpose of this research is to study the factors that predict academic writing difficulties among first-year doctoral students. We will also compare academic writing difficulties, GRE writing scores, and Motivation between international and domestic first-year doctoral students. You are being asked to participate in an anonymous survey. You will be asked a series of question about academic writing. Please be assured that your answers will be kept completely anonymous. Completing the survey will take about 10-15 minutes. You may choose the time and place you complete the survey. Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason. Not participating will not hurt you in any way. You must be aged 18 or older to participate in this study. By clicking the "I consent" button below, you are saying that you: "I wish to participate in this voluntary study". Are 18 years of age or older and are aware that you may choose to stop your participation in the study at any time and for any reason.

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

- ○ I consent, begin the study
- ○ I do not consent, I do not wish to participate

Q1.2 Are you currently enrolled in the first year of a doctoral program at UCF?

- ○ Yes
- ○ No

Q2.1 What is your residency classification as a student at UCF?

- ○ Domestic
- ○ International

Q3.1 Which aspects of writing academically did you find difficult or easy?

	Extremely difficult	Somewhat difficult	Neither easy nor difficult	Somewhat easy	Extremely easy
Grammar accuracy	○	○	○	○	○
Vocabulary use	○	○	○	○	○
Academic style	○	○	○	○	○
Idea development	○	○	○	○	○
Text organization	○	○	○	○	○

Q3.2 To what extent are the following writing conventions difficult for you? Choose all that may apply. (Please rate the degree of difficulty you have faced in the following writing conventions while writing your assignments)

	Extremely difficult	Somewhat difficult	Neither easy nor difficult	Somewhat easy	Extremely easy
Spelling	○	○	○	○	○
Punctuation	○	○	○	○	○
Capitalization	○	○	○	○	○
Grammar	○	○	○	○	○

Q3.3 When writing your assignments during the first year of your doctoral program, which of the following have been difficult for you?

	Extremely difficult	Somewhat difficult	Neither easy nor difficult	Somewhat easy	Extremely easy
Organizing paragraphs	○	○	○	○	○
Presenting ideas in a logical way	○	○	○	○	○
Having less vocabulary than other students	○	○	○	○	○
Selecting appropriate terminology	○	○	○	○	○
Using correct grammar	○	○	○	○	○
Connections and transitions	○	○	○	○	○

Q3.4 Rate the difficulty of the academic writing tasks you were asked to complete during your first year in the graduate program?

	Extremely difficult	Moderately difficult	Neither easy nor difficult	Moderately easy	Extremely easy	Not applicable
Critiquing research articles	○	○	○	○	○	○
Writing reports	○	○	○	○	○	○
Writing summaries of prior research	○	○	○	○	○	○
Writing critical book reviews	○	○	○	○	○	○
Writing critical literature reviews	○	○	○	○	○	○
Writing research papers	○	○	○	○	○	○
Writing grants proposals	○	○	○	○	○	○
Writing research proposals	○	○	○	○	○	○
Writing class discussion postings	○	○	○	○	○	○

Q4.1 When thinking about what motivates you to write academically, please rate how much you agree or disagree with the following statements:

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Academic writing during the doctoral program enables me to attain a certain lifestyle.	○	○	○	○	○
Academic writing during the doctoral program enables me to attain my career goals.	○	○	○	○	○
Academic writing during the doctoral program enables me to attain certain important objectives.	○	○	○	○	○
Academic writing during the doctoral program has become a fundamental part of who I am.	○	○	○	○	○
Academic writing during the doctoral program is a part of my life.	○	○	○	○	○
I want to be good at academic writing to be a good scholar in my field; if not, I would be disappointed in myself.	○	○	○	○	○

Q4.2 When thinking about what motivates you to write academically, please rate how much you agree or disagree with the following statements:

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I want to be good at academic writing during the doctoral program because I would be ashamed of myself if I did not succeed.	○	○	○	○	○
Good academic writing is required to earn my doctoral degree.	○	○	○	○	○
I write my assignments during the doctoral program because it allows me to earn other people's respect.	○	○	○	○	○
I do not know why they require me to do so much academic writing during the doctoral program.	○	○	○	○	○
I do not know why I am given so many difficult writing tasks during the doctoral program.	○	○	○	○	○
I do not seem to be able to finish the important writing tasks related to my program.	○	○	○	○	○

Q5.1 Please select your score on the GRE "Analytic writing" test?

- ○ 1
- ○ 1.5
- ○ 2
- ○ 2.5
- ○ 3
- ○ 3.5
- ○ 4
- ○ 4.5
- ○ 5
- ○ 5.5
- ○ 6
- ○ I did not take the "Analytic writing" test.
- ○ I do not know/ remember.

Q5.2 Please select the range of your score on the TOEFL iBT writing test?

- ○ 1-16
- ○ 17- 23
- ○ 24-30
- ○ I did not take the TOEFL iBT test.
- ○ Not Applicable.
- ○ I do not know/ remember.

Q6.1 Please select the College in which you are enrolled:

▼ Arts & Humanities (1) ... Science (11)

Q6.2 In which semester were you admitted to the Doctoral program at UCF?

- ○ Summer 2018
- ○ Fall 2018
- ○ Spring 2019
- ○ Other

Q6.3 What degree are you pursuing?

- ○ Ph.D.
- ○ Ed.D.
- ○ D.N.P.
- ○ D.P.T.

Q6.4 What is the gender with which you identify yourself?

- ○ Male
- ○ Female
- ○ Transgender Male
- ○ Transgender Female
- ○ Non-binary
- ○ Prefer not to answer

Q6.5 Which best describes your age range?

- ○ 24 or younger
- ○ 25 - 34
- ○ 35 - 44
- ○ 45 - 54
- ○ 55 - 64

- ○ 65 - 74
- ○ 75 - 84
- ○ 85 or older

Q6.6 What is your race?

- ○ White or Caucasian
- ○ Black or African American
- ○ American Indian or Alaska Native
- ○ Native Hawaiian or Pacific Islander
- ○ Asian
- ○ Middle Eastern
- ○ Other

Q6.7 Do you identify yourself as Hispanic?

- ○ Yes
- ○ No

APPENDIX D: DUMMY CODED CATEGORICAL VARIABLES

Table 20 Dummy Coded Categorical Variables

Variable Name	Code	Notes
COLLEGE		
College Arts and Humanities	1	
Business Administration	2	
Community Innovation and Education	3	
Engineering &Computer Science	4	
Other	5	Merged Colleges of Modeling & simulation, medicine, Rosen and optics
Science	6	
Missing	7	
GENDER		
Male		
	1	
Female	2	
Transgender male	3	
Prefer not to answer	4	
Missing	5	
RACE		
White Caucasian	1	
Black /African American	2	
Hawaiian	3	
Asian	4	
Middle Eastern	5	
Other	6	
Missing values	7	
AGE		
24 or younger	1	
25-34	2	
35-44	3	
45-54	4	
55-64	5	

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