Finite Complement Clauses in Disciplinary Research Articles Authored by Filipino Academic Writers

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Article information	Abstract
	Finite complement clauses (FCCs) are an understudied syntactic structure of L2 advanced academic writing. The present study cross-investigated FCCs in qualitative (QUALI) and quantitative (QUANTI) research articles written by Filipino academic writers (FAWs) in Applied Linguistics (APPLING), Communication (COMM), and Measurement and Evaluation (MEEV). Specifically, it determined the FCCs with the most occurrences across five disciplinary research article sub-registers and identified whether these FCCs differ significantly in terms of frequencies of use. With Hernandez's (2021) framework adapted from Biber and Gray's (2016) study, this research analyzed five FCCs in 42 disciplinary research articles. Major results revealed that verb-controlled that-clauses (with 33.69 as normalized frequency count) outnumbered other FCCs in research article sub-registers across disciplines. They were more recurrent in QUALI and QUANTI APPLING research articles (7.91 and 7.54, respectively) and QUANTI and QUALI COMM research articles (7.34 and 6.96, respectively) than in QUANTI MEEV research articles (3.94). In addition, a significant difference exists between them and other FCCs at the p<.05 level in terms of frequencies of use. In view of these findings, it can be concluded that verb-controlled that-clauses are the most useful FCCs in APPLING, COMM, and MEEV research articles. Likewise, FAWs across the three disciplines write more informally as signposted by their repeated use of that complementizer with these FCCs controlled by verbs. The study draws its implications for academic writing instruction.

INTRODUCTION

English is the world language used across academic writing discourses (Flowerdew, 2013; Lillis & Curry, 2016). Specifically, it is utilized by L1 and L2 English users in writing academic research to advance scholarly knowledge across various disciplinary areas (Menghini, 2017; Paltridge, 2013). Of academic writing discourses, the research article has received extensive exploration in terms of English clausal features. One of the clausal features is finite complement clauses (FCCs). FCCs are syntactic structures which consist of subjects and verbs that are marked for tense, aspect, and modality (e.g., Applied linguists assert **that English has evolved into different varieties;** This is a research topic **which students may find interesting; It is important**

that gaps are established in the introduction section of any research paper) (Biber et al., 2016; Biber et al., 2021; Gray, 2015). As in the preceding examples of FCCs (bolded and italicized), they complete the meanings of and are controlled by verbs (e.g., 'assert'), nouns (e.g., 'topic'), or adjectives (i.e., 'important') in main clauses (Biber & Gray, 2016; Biber et al., 2021)—playing an essential role in authors' clear and exact expression of ideas. FCCs in L1 advanced academic writing have obtained considerable attention (e.g., Biber et al., 1999, 2021). Nevertheless, these clauses are scantly examined in research article publications authored by published academic writers from L2 English contexts, particularly Filipino academic writers. Such a gap is what this paper aims to fill in.

In the Philippines, English FCCs are an under-researched topic of study. In fact, only a few studies of these clauses were conducted by English for academic purposes (EAP) researchers in the Philippines. For instance, Gustilo (2010) and Hernandez (2023) examined finite adverbial clauses across disciplinary research articles. However, their studies did not concentrate on FCCs. Exploring FCCs in disciplinary research articles is a pressing need because it may advance positive implications for academic writing instruction. Equally important, such a linguistic investigation is crucial because it can contribute towards fulfilling the Philippine education's thrust of creating more research publications—as stipulated in the Philippines' Commission on Higher Education (CHED) Memorandum Order Number 15, Series of 2019 (CMO No. 15, s. 2019) and Department of Education Order Number 39, Series of 2016 (DepEd Order No. 39, s. 2016). Therefore, this paper seeks to explore FCCs in disciplinary research articles whose authors are Filipino academic writers.

LITERATURE REVIEW

English: The Language of Research

English has an important role in the production of academic research publications. Scholars (e.g., Flowerdew, 2013; Lillis & Curry, 2010) report that 90% of social science research and 95% of natural science research (listed in International Scientific Indexing, now Web of Science) are published in English. Sixty-seven percent of research publications (stored in Ulrich's Periodicals Directory) is written in English. While these figures show that English is the common language used in research publications, there is no evidence that all of them were authored by L1 English users only. Crystal (2008), Flowerdew and Habibie (2022), Galloway (2017), Jenkins (2015), and Rose and Galloway (2019) opine that L2 English users have greatly outnumbered L1 English users across the world—suggesting that more L2 English academic writers participate in academic writing scholarship (Hernandez, 2022; Hernandez & Genuino, 2022). L2 English academic writers include Filipino academic writers (FAWs) who commonly use English in writing research papers in their respective disciplinary communities. FAWs can be defined as professionals and students from various disciplines who have published empirical studies in research journals based in the Philippines.

English is required for writing disciplinary research papers in countries where English is used as an L2 (Hernandez, 2023). As an L2 English nation and a multilingual country, the Philippines

recognizes it as a legitimate language in academic research or scholarly publications, as elucidated by Dayag (2012, 2014). Hernandez (2023) avers that Philippine academic journals require researchers or professionals across education science, social science, and humanities disciplines to use English in writing and submitting research papers, so their studies may reach wider audience; moreover, Philippine higher education institutions demand students in senior high school, undergraduate, and graduate levels to use English in research writing, so they could obtain their academic degrees. This propensity towards using English in research writing is supported by Article XIV, Section 7 of the 1987 Philippine Constitution–stating that English is one of the official languages for communication, among others, in the Philippines. In addition, it is linked with the Philippines' education system–being oriented towards American English (Bautista, 2000, 2001; Gonzalez, 2005). All in all, the English language plays a crucial role in advanced academic writing as a form of (written) communication in the country.

Academic Writing and Research Articles

Academic writing is a style of formal and scholarly writing in colleges and universities and serves as the primary vehicle of transmitting knowledge across areas of specialization (Gray, 2015). It covers different academic writing discourses such as research articles, theses, dissertations, laboratory reports, and so on. There has been a general impression that language variation is present across academic discourses (Hernandez, 2023). More specifically, Gray (2015) and Hyland (2006) claim that language use in academic research writing differs from one discipline to another, and disciplinary communities utilize language resources in various ways. Correspondingly, Biber (2006) and Hyland and Tse (2005) argue that writers employ linguistic devices in line with standards or conventions of academic writing. For example, the use of complement *that*-clauses is more common in popular science and humanities academic writing, but it is less frequent in social science and specialist science academic writing (Biber & Gray, 2016). Such differences in language use are what Flowerdew (2013, p. 307) termed as "situated characteristic". Simply put, Gray (2015) elucidates that linguistic resources used by disciplinary discourse communities are disparate as these communities have different writing systems, research backgrounds, and others. Yet, this notion of linguistic differences is rarely explored in disciplinary research articles written by FAWs.

Of all academic texts, research-based texts particularly published research articles represent advanced academic writing or academic research writing (Biber & Gray, 2010, 2011; Gray, 2015). Research articles are scholarly written texts reporting scientifically produced firsthand knowledge or new perspective (van Enk & Power, 2017). As academic written discourse, it has been an essential requirement in universities (Hassanzadeh & Tamleh, 2023), has received the highest privilege across disciplines, and has turned as the master of academic texts for decades (Swales, 2004). Gray (2015) classifies research articles into sub-registers (i.e., theoretical, qualitative, and quantitative research articles) according to research paradigms in hard sciences (e.g., Engineering, Medicine) and soft sciences (e.g., Applied Linguistics, Education). Theoretical research articles communicate theories and principles in fields such as Economics, Philosophy, and so on. Qualitative (QUALI) research articles have QUALI data and employ QUALI research designs and methods (e.g., grounded theory, interview) in fields such as Sociology, Education, and others. Quantitative (QUANTI) research articles contain numerical data and use QUANTI

research designs and methods (e.g., experimental, survey) in disciplines like Chemistry, Physics, etc. In disciplinary RA sub-registers published in Philippine research journals, FCCs have earned very little or no exploration.

Studies of FCCs

Most studies of FCCs in disciplinary research articles have focused on advanced academic writing in L1 English (e.g., Biber & Gray, 2016; Hyland & Jiang, 2017; Gray, 2015; Kim & Crosthwaite, 2019). Biber and Gray (2016) discovered that verb-controlled *that*-clauses are common across biology, medicine, ecology, physiology, education, psychology, and history research articles unlike other FCCs. Comparatively, Hyland and Jiang (2017) revealed that evaluative *that*-clauses decreased in use across applied linguistics, biology, electrical engineering, and sociology research articles published in 1965, 1985, and 2015. Similarly, Kim and Crosthwaite (2019) found that evaluative clauses are controlled commonly by epistemic verbs in business and medicine research articles—allowing authors to comment on their own and other researchers' findings. Gray (2015) showed that complement *wh*-clauses and noun-, verb-, and adjective-controlled complement *that*-clauses are frequent in QUANTI political science and QUALI applied linguistics research articles—signifying academic involvement and elaboration. Biber and Gray (2010, 2011), Biber et al. (2016), Biber et al. (2011), Lu et al. (2020), Staples et al. (2016), and Yin et al. (2021) had also examined clauses; however, they did not concentrate on FCCs alone.

Studies of FCCs in L2 advanced academic writing are scarce. Gustilo (2010) and Hernandez (2023) explored finite adverbial clauses in research articles published in the Philippines. On the one hand, Gustilo (2010) revealed that causative and conditional clauses are used very frequently in introduction and results and discussion sections of research articles in the fields of language teaching and applied linguistics. On the other hand, Hernandez (2023) found that causative clauses are the most dominantly used and are steadily located in the final position of sentences across disciplinary research articles. Clearly, a paucity of research on FCCs in Filipino-authored research articles exists. This study problematizes the scarcity of investigation on FCCs in research articles written by FAWs across disciplines. Investigating FCCs in research articles authored by FAWs across disciplines is needed in view of the succeeding grounds. First, FCCs are used by FAWs in writing research articles (Hernandez, 2021); hence, their use of these clauses deserves exploration. Second, English is an official language in scholarly and academic publications in the Philippines (Dayag, 2012, 2014); thus, English FCCs merit examination. Third and lastly, they are uncharted research niche in academic writing research in the country as an L2 English context; in other words, no research cross-examining FCCs in QUALI and QUANTI disciplinary research articles authored by FAWs has been published.

For these reasons, I attempted at cross-analyzing FCCs in Filipino-authored Applied Linguistics, Communication, and Measurement and Evaluation research articles. Specifically, I sought to fulfill these objectives: 1. determine the most frequently occurring FCCs in the disciplinary RA sub-registers, and 2. identify whether a significant difference exists between the most occurring FCCs and other FCCs in terms of frequencies of use.

METHODOLOGY

Research Design, Data Sources, and Data Selection

Descriptive-comparative research design was used to delineate FCCs across the disciplinary research articles. Because research articles are the leading academic texts (Swales, 2004) and most represent advanced academic writing (Biber & Gray, 2016; Gray, 2015), 42 published research articles (180,534 tokens) from Applied Linguistics (APPLING), Communication (COMM), and Measurement and Evaluation (MEEV) disciplines were chosen as data sources (Table 1). APPLING was included due to its high rate of publication (Gray, 2015) whereas COMM and MEEV were selected since they were not explored in the earlier studies. Previous studies (e.g., Biber & Gray, 2010, 2016; Gray, 2015) included the humanities and education as fields in general but did not consider COMM and MEEV as specific disciplines under each of them. Also, the three disciplines are prioritized research areas of the Philippines' Commission on Higher Education (2009). In these regards, the three disciplines deserve to be explored in terms of FCCs. It should be noted that the disciplinary research articles were randomly sampled from various local research journals in the Philippines. This facet of the current study was not given attention in the past research on L1 advanced academic writing.

Table 1
Disciplinary research article sub-registers

Publication Years	Disciplines	Frequency per Research Article Sub-register				Overall Number of Research Articles	Overall Tokens
		QUALI	Total Number of Words	QUANTI	Total Number of Words		
					s		
2008-2018	APPLING	7	30,388	7	31,287	14	61,675
2009-2019	COMM	7	30,252	7	33,821	14	64,073
2010-2020	MEEV			14	54,786	14	54,786
Total	3	14	60,640	28	119,894	42	180,534

The selection measures of the disciplinary research articles were adapted from Hernandez and Genuino's (2022) and Ruan's (2018) studies. Surnames and academic institutions which exist in the Philippines were considered to ascertain that research articles with a single author or multiple authors are written by FAWs. Spanish and Chinese surnames were also counted because they have long been rooted in Philippine cultural heritage. By history, the Philippines became a longtime colony of Spain for 333 years (Mabayo, 2019). By ancestry, numerous Filipinos with Chinese lineage were born and reared in the country (Senate of the Philippines, 2013). As these factors indicate that Spanish and Chinese surnames are natural in the Philippines, the nationalities of certain authors of the selected research articles are not automatically problematic. Other surnames which posed ambiguity were discarded. Other measures (e.g., international schooling) that are not typically written in published research articles were not considered.

The research articles were clustered into five disciplinary research article sub-registers, adhering to research article classifications of Gray (2015): QUALI APPLING research articles (7);

QUANTI APPLING research articles (7) (14); QUALI COMM research articles (7); QUANTI COMM research articles (7) (14); and QUANTI MEEV research articles (14) (Table 1). Overall, each disciplinary research article sub-register has 7 research articles (except QUANTI MEEV research articles [with 14 research articles]). Only MEEV research articles have no QUALI research articles because almost all sampled MEEV research articles can be categorized as QUANTI research articles. These disciplinary research article sub-registers were issued in a period of 10 years because the present investigation is synchronic by nature. Even though the selection of these disciplinary research article datasets may not be ideal, the researcher upholds that these datasets depict FAWs as L2 English users.

Framework, Inter-coder Reliability, and Normalization

The study adopted Hernandez's (2021, pp. 605-606) FCCs framework which was adapted from Biber and Gray's (2016) study (Table 2). This framework was used as the coding scheme.

Table 2
FCCs framework

FCCs	Sentences
Verb-controlled *that*-clause	They *reported* **that they had kind-hearted classmates.**
Verb-controlled *wh*-clause	Verb-controlled *when*-clause The phase *was completed* **when the team agreed on contentious issues.** Verb-controlled *how*-clause This research also *investigates* **how all these factors can elicit positive and affective attitude [from students toward their satisfaction.**
Adjective-controlled *that*-clause	It is *insufficient* **that the respondents only agreed to the statements about the health promotion strategies…**
Noun-controlled *that*-clause	This implies that the majority of the participants are somewhat familiar with the resurrection since it is a central tenet in the *religion* **that they practice.**
Noun-controlled *wh*-clause	Noun-controlled *which*-clause This is an *activity* **which everyone looks forward to.** Noun-controlled *where*-clause Reading is a *habit* **where students learn, gain knowledge and develop new skills….** Noun-controlled *wherein*-clause The host, Papa Joe, handles the *program* **wherein the callers phone-in their problems on the air.** Noun-controlled *when*-clause …he is also aware of the *times* **when she is not in the mood** and that she can't be controlled when she's angry. Noun-controlled *whom*-clause The 18 respondents had different family *members* **whom they** *immediately thought* **of as enjoying reading.** Noun-controlled *whose*-clause …their mean responses pertaining to awareness, acceptance, relevance and congruence of the VMGOs are verbally interpreted as very great extent with the exception of *participants*… **whose mean responses ranging from 3.73 to 4.10 are verbally interpreted as to a great extent.** Noun-controlled *on how*-clause As what can be observed on the table above, the teacher respondents also have their own *opinions* **on how absenteeism affects the school performance.**

FCCs	Sentences
	Noun-controlled *of how*-clause …if follow-up research extends the methodology to include an activity that engages (e.g. KII, FGD, survey) the target market (i.e. viewers, audience, the public) in order to unravel the epistemic *problem* **of how members of a society acquire and assign meaning to its environment**.

The framework is comprised of five types of FCC: 1. verb-controlled *that*-clause; 2. verb-controlled *wh*-clause; 3. adjective-controlled *that*-clause; 4. noun-controlled *that*-clause; and 5. noun-controlled *wh*-clause. Each FCC in disciplinary research article sub-registers was analyzed through AntConc (Anthony, 2021) and manual coding. AntConc was used to extract FCCs from the disciplinary research article sub-registers. Then, they were saved in Excel files. To do these, *that, when, how, which, where, wherein, when, whom, whose, on how,* and *of how* were utilized as nodes to search for FCCs through AntConc. Afterwards, manual analysis was performed. I hand-coded each clause per disciplinary research article sub-register in Excel files. Coding by hand was essential as corpus applications may provide inaccurate results (Biber & Gray, 2016; Egbert et al., 2020; Kim & Crosthwaite, 2019; Ruan, 2018). For instance, *that*-clauses needed manual coding because they can complement verbs, adjectives, or nouns. In addition, *that* has different syntactic functions as it can be a linking adverbial, a demonstrative pronoun, or a complementizer.

Three professional and trained coders independently examined all the pre-coded FCCs. They are PhD holders with specialization in Applied Linguistics. They have published empirical studies on English grammar, academic discourse, and others. The first and second coders have been teaching Applied Linguistics and language research courses in both graduate and undergraduate levels for 15 and 20 years, respectively. The third coder has been handling research and advanced grammar subjects in the graduate level for 26 years. Two inter-coding stages occurred. On stage 1, I and each inter-coder on separate meetings found and resolved contradictory judgments. Further discussions were carried out until I and each inter-coder reached unanimous decisions. On stage 2, I and each inter-coder again met separately after a week to review and compare our judgments for each case of complement clause until we arrived at final judgments. Inter-coder reliability was calculated through Fleiss Kappa which resulted in 0.97 (an almost perfect reliability agreement).

Normalized frequencies were computed by dividing every raw frequency of every FCC to the total word counts of every research article sub-register in each discipline. Then, each quotient was standardized by 1,000—following previous corpus studies (e.g., Biber et al. 2016). To know whether a significant difference between and among FCCs exists in terms of frequencies of use, the study employed one-way ANOVA test.

RESULTS AND DISCUSSION

This section presents the results and discussion. Salient findings are related to the results of the past studies.

In response to the first objective, it was found that verb-controlled *that*-clauses (33.69) had the highest occurrences across the QUALI and QUANTI disciplinary research articles (Figure 1). This result is related with Biber and Gray's (2016), Hyland and Jiang's (2017), and Kim and Crosthwaite's (2019) findings that complement *that*-clauses are typically controlled by verbs in disciplinary research articles written in L1 English. This relation suggests that verb-controlled *that*-clauses used by FAWs conform to those used by L1 English academic writers, who can be considered residing in inner circle countries (Kachru, 1985)–particularly in the United States of America (USA). This assertion is associated with the claim of Kachru (1985, 1997) specifying that the USA, along with its American English variety, is one of the inner circle nations which has dominantly influenced numerous Filipinos in terms of using English, among others (Bautista, 2000; Gonzalez, 2005). In this regard, Schneider (2023) asserts that the English employed by Filipinos is closely related with American English (Bautista, 2001; Gonzalez, 2005). Historically, the USA contributed the English language into the education system of the Philippines (Gonzalez, 2005). At present, the language is widely used across regions in the country. In view of these, it appears that FAWs' most frequent use of verb-controlled *that*-clauses adheres to American English. This point, in general, substantiates the conformity of L2 English academic writers (e.g., FAWs) and L2 English academic writing with traditional and standardized exonormative English models (Mauranen et al., 2021), like American English.

Verb-controlled *that*-clauses were succeeded by noun-controlled *that*-clauses (7.25), verb-controlled *wh*-clauses (6.45), noun-controlled *wh*-clauses (4.24), and adjective-controlled *that*-clauses (1.82). The stark contrast of occurrences between verb-controlled *that*-clauses and other FCCs proves that APPLING, COMM, and MEEV research articles are more verb-oriented because of the dominance of finite clauses complementing verbs (Hernandez, 2021).

In answer to the second objective, a significant difference exists between and among the frequencies of use of the five FCCs at the $p<.05$ level [F (4,20)] = 56.29, p = <.05] as yielded by one-way ANOVA test. Post hoc Tukey HSD test with pairwise comparisons of the five FCCs revealed that they were significantly different at the $p<.05$ level. As signaled by the asterisk in Appendix A, verb-controlled *that*-clauses had a significant difference from other FCCs in terms of frequencies of use. Hence, it can be construed that verb-controlled *that*-clauses are the most widely utilized FCCs in Filipino-authored disciplinary research articles. Overall, the aforesaid result reverberates the claim of Gray (2015) and Hyland (2006) that language use differs vis-a-vis research article sub-registers and disciplines.
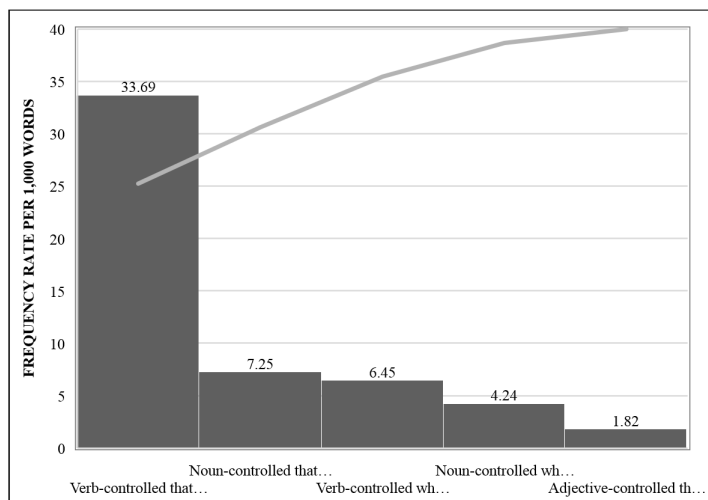
Figure 1 Ranking of the five FCCs

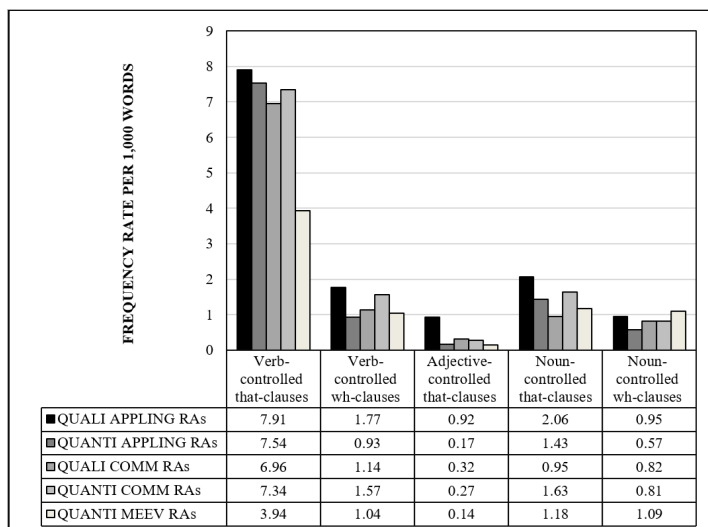|	Verb-controlled that-clauses	Verb-controlled wh-clauses	Adjective-controlled that-clauses	Noun-controlled that-clauses	Noun-controlled wh-clauses
■ QUALI APPLING RAs	7.91	1.77	0.92	2.06	0.95
▨ QUANTI APPLING RAs	7.54	0.93	0.17	1.43	0.57
▨ QUALI COMM RAs	6.96	1.14	0.32	0.95	0.82
▨ QUANTI COMM RAs	7.34	1.57	0.27	1.63	0.81
▨ QUANTI MEEV RAs	3.94	1.04	0.14	1.18	1.09

Figure 2 Distributions of FFCs

Figure 2 shows the frequency distributions of the five FCCs across the disciplinary research article sub-registers. Verb-controlled *that*-clauses outnumbered other FCCs across the five disciplinary research article sub-registers—implying that these disciplinary research article sub-registers contain more dependent clauses which elaborate verbs. Likewise, such an elaboration is made by FAWs to reveal the specific meanings underlying the controlling verbs. These FCCs are discussed in the subsequent sections.

Verb-controlled *That*-clauses

Verb-controlled *that*-clauses were most frequent in QUALI APPLING research articles (7.91) but least frequent in QUANTI MEEV research articles (3.94). Their dominance in QUALI APPLING research articles confirms Gray's (2015) finding that *that*-clauses controlled by verbs are

common in QUALI APPLING research articles. Succeeding QUALI APPLING research articles were QUANTI APPLING research articles (7.54), QUANTI COMM research articles (7.34), and QUALI COMM research articles (6.96). These findings suggest that, across the five disciplinary research article sub-registers, *that*-clauses usually complement verbs—validating Biber and Gray's (2016), Hyland and Jiang's (2017) and Kim and Crosthwaite's (2019) claim.

The higher recurrence of verb-controlled *that*-clauses in QUALI and QUANTI APPLING research articles and QUANTI and QUALI COMM research articles over QUANTI MEEV research articles may be explained by the disciplinary nature of the three disciplines. APPLING and COMM are inter-related fields in that they commonly examine language-related problems and communicative events, respectively, whereas MEEV normally measures ones' quantifiable judgments on ones' (e.g., students, teachers, etc.) performance. Language-related problems in APPLING research and communicative events in COMM studies require more elaboration as they are not fixed foci of investigation, while quantifiable judgments in MEEV research may not need more explanations because they typically have fixed statistical interpretations. In view of these dichotomies, more elaboration is necessary in writing QUALI and QUANTI APPLING and COMM research articles, but less elaboration is needed in writing QUANTI MEEV research articles.

By discourse function, verb-controlled *that*-clauses express the reported thought, speech, emotion, attitude, or epistemic judgment normally of humans (Biber al., 1999, 2021). Correspondingly, controlling verbs (Biber al., 1999, 2021) determine the types of reporting (e.g., thought, speech, emotion, attitude, or judgment). Samples 1 to 5 from the disciplinary research article sub-registers illustrate complement *that*-clauses (bolded) controlled by verbs (italicized and identified according to their semantic categories [enclosed in parentheses]).

1) Malbago (2000) who studied the language profile of Zamboanga City *revealed* (existence verb) **that Chabacano is still the dominant language of the city**. [QUALI APPLING research article]

2) Social cognitive theory also *asserts* (communication verb) **that the sense of self-efficacy is always concomitant with optimistic teaching behaviors and successful student-learning outcomes** (Henson, 2001). [QUANTI APPLING research article]

3) The FGD participants also *observed* (mental verb) **that the layout of the school publication was not so convincing**. [QUANTI COMM research article]

4) By using this anecdotal evidence, Rosenberg (2007) was able to *explain* (communication verb) **that viral videos are often results of their environments**. [QUALI COMM research article]

5) Results from the previous studies *showed* (activity verb) **that Self-Oriented Perfectionism (SOP) is positively related with achievement goals...** (Gaudreau & Verner-Filion, 2010). [QUANTI MEEV research article]

These *that*-clauses elaborate on different things with respect to their controlling verbs. Specifically, sample 1 from a QUALI APPLING research article reports the existence of Chabacano as the dominant language of Zamboanga City. Such an existence is determined by the existence verb, 'revealed'. Existence verbs (e.g., *reveal, seem, appear*) express a state of experience or a relationship between entities (Biber, 2006). In contrast, 2 from a QUANTI APPLING research article is an assertion that self-efficacy is always concomitant with teaching behaviors and student-learning outcomes—as signaled by the communication verb, 'asserts'. Likewise, 4 from a QUALI COMM research article is an elucidation that viral videos are often results of their environments as signposted by the communication verb, 'explain'. Communication verbs, such as *asserts* and *explain*, convey communicative actions (spoken or written) (Biber, 2006). However, 3 from a QUANTI COMM research article expresses a perception that the layout of the school publication was not very convincing as hinted by the mental verb, 'observed'. Mental verbs, like *observe, prove*, and *find*, depict one's cognition, emotion, attitude, desire, or perception (Biber, 2006). Sample 5 from a QUANTI MEEV research article communicates an event that SOP is positively related with achievement goals as indicated by the activity verb, 'showed'. Activity verbs (e.g., *show, add, move*) communicate actions or occurrences commonly associated with choice (Biber, 2006). Through these verb-controlled *that*-clauses, FAWs across the three disciplines elaborate cognitions, communications, existence, and occurrences underpinned by the controlling verbs which they use. Such elaborations correspond to their thoughts, attitudes, emotions, and judgments (Biber et al., 1999, 2021).

Other FCCs were found to have relatively low occurrences across the disciplinary research article sub-registers. Despite this, they also need to be discussed as they are also used by FAWs. As verb- and noun-controlled *that*-clauses had consecutive frequencies of use across the disciplinary research articles, they hint that L2 advanced academic writing by FAWs possesses some degree of informal discourse style regardless of disciplinary research article sub-registers. This point resonates Biber et al.'s (1999, 2021) assertion that *that*-clauses are associated with colloquialism (Collins et al., 2014).

Noun-controlled *That*-clauses

Between noun- and adjective-controlled *that*-clauses, the former was more frequently used than the latter across the disciplinary research article sub-registers. Noun-controlled *that*-clauses occurred higher in QUALI APPLING research articles (2.06) than those in QUANTI COMM (1.63), APPLING (1.43), and MEEV research articles (1.18), and QUALI COMM research articles (0.95). By discourse function, noun-controlled *that*-clause is used to mark stance in a manner that it reports and specifies a proposition (Biber et al., 1999, 2021), thus giving an explicit identification (Chafe, 1985) for the controlling noun. The controlling noun signals the writer's stance or attitude towards a proposition (Biber et al., 1999, 2021). Biber et al. (2021, p. 643) elucidate that controlling nouns of *that*-clauses provide two types of stance: first, "an indication of the source of the knowledge expressed in the *that*-clause" and second, "an assessment of the certainty of the proposition in the *that*-clause". Samples 6 to 10 exemplify complement *that*-clauses (bolded) with their controlling nouns (italicized and identified based on their semantic classes [enclosed in parentheses]).

6) …. it will significantly offer students with particular metalinguistic *features* (abstract/process noun) **that they may consider when writing**. [QUALI APPLING research article]

7) The theoretical *framework* (abstract/process noun) **that the researchers used…** [QUANTI COMM research article]

8) …, the respondents have professed their *confidence* (abstract/process noun) **that they can exercise good instructional techniques…** [QUANTI APPLING research article]

9) …, achievement goals were used as a mediator between perfectionism and academic achievement (Gaudreau & Verner-Filion, 2010), providing *evidence* (abstract/process noun) **that perfectionism is a predictor of achievement goals**. [QUANTI MEEV research article]

10) Audiences listen because it talks to them in a *tone and language* (abstract/process nouns) **that they are receptive to…** [QUALI COMM research article]

These *that*-clauses give explicit information about controlling abstract/process nouns. As abstract/process nouns convey intangible concepts or processes (Biber, 2006), they require complement *that*-clauses to be definite. Specifically, samples 6 from a QUALI APPLING research article 'that they may consider when writing', 7 from a QUANTI COMM research article 'that the researchers used…', and 9 from a QUANTI MEEV research article 'that perfectionism is a predictor of achievement goals' complement 'features', 'framework', and 'evidence', respectively, hence supplying specific information about each controlling noun. At the same time, the controlling abstract/process nouns serve as sources of the knowledge or idea expressed in complement *that*-clauses. However, samples 8 from a QUANTI APPLING research article 'that they can exercise good instructional techniques…' and 10 from a QUALI COMM research article 'that they are receptive to…' complement 'confidence' and 'tone and language', respectively. These nouns function as assessments of the certainty of the propositions depicted in *that*-clauses. These examples show that noun-controlled *that*-clauses are also employed by FAWs to elaborate propositions vis-a-vis the controlling nouns they use, therefore supporting Biber et al.'s (1999, 2021) assertion.

Verb- and Noun-controlled *Wh*-clauses

The following findings are new as they were not reported in the previous studies. Between verb- and noun-controlled *wh*-clauses, the former occurred more frequently than the latter across the disciplinary research articles—as shown in Figure 1. As shown in Figure 2, verb-controlled *wh*-clauses in QUALI APPLING research articles (1.77) were comparatively higher than those in QUANTI (1.57) and QUALI COMM research articles (1.14), and QUANTI MEEV (1.04) and APPLING research articles (0.93). On the other hand, noun-controlled *wh*-clauses in QUANTI MEEV research articles (1.09) were relatively higher than those in QUALI APPLING research articles (0.95), QUALI (0.82) and QUANTI COMM research articles (0.81), and QUANTI APPLING research articles (0.57). These results imply that verb- and noun-controlled *wh*-clauses are also used evenly across the disciplinary research article sub-registers despite their low frequencies compared to verb- and noun-controlled *that*-clauses.

Of the verb- and noun-controlled *wh*-clauses, verb-controlled *when*-clauses and noun-controlled *where*-clauses were the only two steadily present complement *wh*-clauses across the five disciplinary research article sub-registers (see Figure 3). For this reason, they deserve to be discussed in this section. This finding indicates that elaboration of time through *when*-clauses and place through *where*-clauses exists in APPLING, COMM, and MEEV research articles. Their higher occurrences entail that *when* and *where*, as interrogative words, are more flexible than other *wh*-words (Hernandez, 2021); thus, FAWs lean towards using more complement *when*- and *where*-clauses and tend to elaborate more time and place in writing APPLING, COMM, and MEEV research. Between the two, verb-controlled *when*-clauses (QUALI [1.29] and QUANTI APPLING research articles [0.86], QUANTI MEEV research articles [0.91], and QUANTI COMM research articles [0.73]) occurred more frequently than noun-controlled *where*-clauses (QUALI [0.77] and QUANTI APPLING research articles [0.33], QUANTI MEEV research articles [0.75], and QUANTI COMM research articles [0.30]). However, with lowest occurrences, noun-controlled *where*-clauses in QUALI COMM research articles (0.57) occurred slightly higher than verb-controlled *when*-clauses in QUALI COMM research articles (0.51).
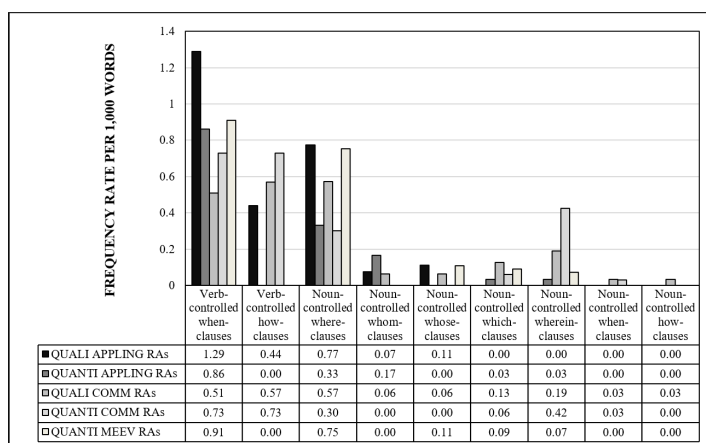

FREQUENCY RATE PER 1,000 WORDS	Verb-controlled when-clauses	Verb-controlled how-clauses	Noun-controlled where-clauses	Noun-controlled whom-clauses	Noun-controlled whose-clauses	Noun-controlled which-clauses	Noun-controlled wherein-clauses	Noun-controlled when-clauses	Noun-controlled how-clauses
■ QUALI APPLING RAs	1.29	0.44	0.77	0.07	0.11	0.00	0.00	0.00	0.00
▣ QUANTI APPLING RAs	0.86	0.00	0.33	0.17	0.00	0.03	0.03	0.00	0.00
▨ QUALI COMM RAs	0.51	0.57	0.57	0.06	0.06	0.13	0.19	0.03	0.03
☐ QUANTI COMM RAs	0.73	0.73	0.30	0.00	0.00	0.06	0.42	0.03	0.00
☐ QUANTI MEEV RAs	0.91	0.00	0.75	0.00	0.11	0.09	0.07	0.00	0.00

Figure 3 Distributions of verb- and noun-controlled *wh*-clauses across the disciplinary research article sub-registers

As with the dominance of verb-controlled *that*-clauses, the higher frequencies of *when*- and *where*-clauses controlled by verbs further attest that APPLING, MEEV, and COMM research articles are more verb-inclined. By discourse function, verb-controlled *when*-clause elaborates the specific time when an event or action takes place while noun-controlled *where*-clause provides an account of places or contexts where a phenomenon is held (Hernandez, 2021). Samples 11 to 14 illustrate complement *when*-clauses (bolded) with their controlling verbs (italicized and identified based on their semantic categories [enclosed in parentheses]).

11) The second step is also the same method they *do* (activity verb) **when they want to impress the teacher**. [QUALI APPLING research article]

12) Problems on agreement *occur* (occurrence verb) **when the writer does not know whether the subject should be regarded as singular or plural**. [QUANTI APPLING research article]

13) Overall mean of 52.75 was *computed* (activity verb) **when students were taken as a whole...** [QUANTI MEEV research article]

14) ... listeners are *persuaded* (communication verb) **when there is a narration or storytelling of the point of view or idea...** [QUANTI COMM research article]

These verb-controlled *when*-clauses give explicit identification of the time when actions depicted in the controlling verbs happen or happened. For instance, 11 from a QUALI APPLING research article and 13 from a QUANTI MEEV research article complement activity verbs, 'do' and 'computed'. Sample 11 specifies the time when students 'do' the second step (i.e., 'when they want to impress the teacher'). Similarly, 13 identifies the time when the overall mean was 'computed' (i.e., 'when students were taken as a whole...'). In contrast, sample 12 from a QUANTI APPLING research article complements the occurrence verb, 'occur'. Occurrence verbs (e.g., *occur, develop, change*) express physical events which happen apart from a volitional activity (Biber, 2006). Likewise, 12 conveys the time when problems on (subject-verb) agreement happen (i.e., 'when the writer does not know whether the subject should be regarded as singular or plural'). Sample 14 from a QUANTI COMM research article identifies the time when listeners are 'persuaded', that is, 'when there is a narration or storytelling of the point of view or idea'—completing the meaning of the communication verb, 'persuaded'. This example ('when **there** is...') shows that *when*-clause may co-occur with existential *there* construction where *there* acts as a dummy subject rather than as an adverbial (Biber et al., 1999, 2021). As can be seen in 13 '...was computed...' and 14 '...are persuaded...', the controlling verbs of *when*-clauses can be in passive forms, but what counts as the controlling verbs are the main verbs (Hernandez, 2021) as in '...computed' and '...persuaded'.

Noun-controlled *where*-clauses elaborate the place or context associated with the controlling nouns. Samples 15 to 18 demonstrate complement *where*-clauses (bolded) with their controlling nouns (italicized and identified according to their semantic classes [enclosed in parentheses]).

15) ..., the findings of Richards correspond to the errors of the participants in the study - that of insertion and deletion of articles in *places* (place noun) **where they are not supposed to appear or be omitted**. [QUALI APPLING research article]

16) ..., the listeners participated in a Focus Group *Discussion* (FGD) (abstract/process noun) **where some questions about the script and other issues concerning the listening activity were raised**. [QUANTI APPLING research article]

17) ... the varied teaching-learning styles offered to the students as they experienced immersion to the *community* (group/institution noun) **where they served as trainers, facilitators, coordinators and resource speakers**. [QUANTI MEEV research article]

18) Experiencing such may vary on its extent or level depending on the kinds of people they are conversing with and the communication *situations* (abstract/process noun) **where they are communicating with**. [QUANTI COMM research article]

Specifically, sample 15 'where they are not supposed to appear or be omitted' from a QUALI APPLING research article elaborates 'places', a place noun—which names any area in a particular location (Biber, 2006). Likewise, 16 'where some questions about the script and other issues concerning the listening activity were raised' from a QUANTI APPLING research article and 18 'where they are communicating with' from a QUANTI COMM research article complement '...Discussion' and 'situations' (abstract/process nouns), respectively. In contrast, 17 'where they served as trainers, facilitators, coordinators and resource speakers account for' from a QUANTI MEEV research article explains 'community', a group/institution noun—which denotes a name of a group or institution (Biber, 2006).

As shown in Figure 3, verb-controlled *how*-clauses, noun-controlled *whom-*, *whose-*, *which-*, *wherein-*, *when-*, and *how-*clauses had lower, sporadic, or zero occurrences across the disciplinary research article sub-registers. Two explanations may support this finding: first, they are not syntactic characteristics of research articles across the three disciplines; second, they are more common in face-to-face conversations (Biber et al., 1999, 2021).

Adjective-controlled *That*-clauses

Adjective-controlled *that*-clauses had the least occurrences across the disciplinary research article sub-registers. They were relatively more frequent in QUALI APPLING research articles (0.92) than those in QUALI (0.32) and QUANTI COMM research articles (0.27), QUANTI APPLING research articles (0.17), and MEEV research articles (0.14). By discourse function, adjective-controlled *that*-clause expresses specific propositions that may express degrees of certainty, affective states, or evaluations of situations, events, and others (Biber et al., 1999, 2021). Like controlling nouns, controlling adjectives report the writer's stance towards his or her proposition. Samples 19 to 23 exemplify *that*-clauses (bolded) with their controlling adjectives (italicized and identified according to their semantic classifications [enclosed in parentheses]).

19) In Extract 14 it is *clear* (certainty adjective) **that T1 has no problem with the Philippine variety of English.** [QUALI APPLING research article]

20) They feel *fulfilled or gratified* (attitude/emotion adjective) **that their need is answered.** [QUALI COMM research article]

21) These students get so *nervous* (attitude/emotion adjective) **that certain parts of their body feel very tensed and rigid...** [QUANTI COMM research article]

22) It is *apparent* (certainty adjective) **that better thinking helps in learning more from our experience and in making better use of one's intelligence.** [QUANTI APPLING research article]

23) It was not *surprising* (evaluative adjective) **that all the four items on cultural bullying in the PECK loaded together with most verbal-relational items in the new 3-factor model...** [QUANTI MEEV research article]

Samples 19 from a QUALI APPLING research article and 22 from a QUANTI APPLING research article convey corresponding degrees of clarity and apparentness as signaled by the adjectives 'clear' and 'apparent', respectively. These certainty adjectives express the degrees of likelihood or certitude of propositions (Biber et al., 1999, 2021). Thus, 'clear' verifies the degree of clarity of the proposition in 19 'that T1 has no problem with the Philippine variety of English' whereas 'apparent' confirms the degree of apparentness of the proposition in 22 'that better thinking helps in learning more from our experience and in making better use of one's intelligence'.

In contrast, both 20 from a QUALI COMM research article and 21 from a QUANTI COMM research article communicate specific attitudes or emotions. These attitudinal propositions are signposted by attitude/emotion adjectives, 'fulfilled or gratified' and '...nervous'. Attitude/Emotion adjectives like these entail some affective states towards propositions (Biber et al., 1999, 2021). Hence, 'fulfilled or gratified' implies the fulfilment or gratification expressed in 20 'that their need is answered'. In contrast, '...nervous' signals the nervousness communicated in 21 'that certain parts of their body feel very tensed and rigid...'.

Lastly, 23 (i.e., 'that all the four items on cultural bullying in the PECK loaded together with most verbal-relational items in the new 3-factor model...') from a QUANTI MEEV research article is an evaluative proposition as indicated by the evaluative adjective, '...surprising'. Evaluative adjectives (e.g., *surprising, appropriate*) show a range of assessments of the action or situation specified in the proposition (Biber et al., 1999, 2021). As can be observed in 19 '*...it* is clear *that...*', 22 '*It* is apparent *that...*', and 23 '*It* was not surprising *that...*', adjective-controlled *that*-clauses tend to co-occur with extraposed *it* construction, confirming Biber et al.'s (1999, 2021) and Biber and Gray's (2016) claim.

CONCLUSION AND IMPLICATIONS

In this study, I cross-examined FCCs in disciplinary research article sub-registers authored by FAWs. Salient findings revealed that verb-controlled *that*-clauses exceeded other FCCs across the disciplinary research article sub-registers. They were more frequent in both QUALI and QUANTI APPLING research articles and QUANTI and QUALI COMM research articles than in QUANTI MEEV research articles. As proven by one-way ANOVA with post hoc Tukey HSD test, these FCCs significantly differed from other FCCs in terms of frequencies of use. In conclusion, verb-controlled *that*-clauses are the most functional FCCs in QUALI and QUANTI research articles written by FAWs in APPLING, COMM, and MEEV. In line with this, FAWs across the three disciplines lean towards being more informal because of their recurrent use of *that* complementizer with these FCCs controlled by verbs.

As in Hernandez's (2023) study, the present study's conclusions imply important implications for academic writing instruction across the three disciplines in L2 English contexts. Teachers handling advanced academic writing courses need to integrate FCCs primarily verb-controlled *that*-clauses in their teaching. They should inculcate to students the form, function, and meaning of verb-controlled *that*-clauses with authentic examples from published QUALI and QUANTI disciplinary research articles. By so doing, advanced academic writing classes could be more contextualized, and students can be more equipped in writing academic research.

This research attempt has not yet reached its finality. While it has contributed knowledge in academic writing scholarship in L2 English countries like the Philippines and has responded to the Philippines' CMO No. 15, s. 2019 and DepEd Order No. 39, s. 2016 to produce more research, it also proposes research directions. Analyzing research article sub-registers from other soft disciplines specifically curriculum and instruction, psychology, and sociology and from hard disciplines particularly biology, engineering, and medicine is necessary. Thus, variations on the use of FCCs across soft and hard sciences can be unveiled. Examining disciplinary research article sub-registers authored by other L2 English academic writers is also recommended to further understand how research writers from different L2 English countries employ FCCs. Exploring these clauses in occluded genres like research proposals, theses, and dissertations equally requires attention. Considering this recommendation may uncover specific FCCs allied to these academic written genres. Furthermore, the use of non-finite complement clauses as another underexplored syntactic structure deserves exploration and should be compared with the use of FCCs in disciplinary research articles. Hence, the characteristic finite and non-finite complement clauses of L2 advanced academic writing may be revealed.

Future studies fulfilling the preceding trajectories may create and offer more constructive implications for academic writing instruction in L2 English settings. Despite the fact that L2 English users have exceeded L1 English users worldwide (Crystal, 2008; Flowerdew & Habibie, 2022; Galloway, 2017; Jenkins, 2015; Rose & Galloway, 2019), research on FCCs in L2 advanced academic writing has been scant especially in the Philippines (Hernandez, 2021). Therefore, more studies of these English syntactic structures in disciplinary research articles authored by L2 English academic writers like FAWs must be endeavored–particularly from the perspective of world Englishes (WEs), English as a lingua franca (ELF), or English as an international language (EIL).

This last point does not necessarily claim that WEs, ELF, or EIL no longer abides by standard English conventions when it comes to advanced academic writing. Nonetheless, it contends that it is equally important that future studies may be anchored in any of the three standpoints (whose orientations differ from the stance of L1 English)–for a fact that academic writing is not performed only by L1 English users, but also by L2 English academic writers with different first languages. Considering any of WEs, ELF, and EIL might be a more congruent lens in exploring advanced academic writing especially by multilingual English academic writers across disciplines. This effort is imperative in order to unfold the possible syntactic features distinguishing their academic papers. Such features may be used as a basis for the enhancement of academic English writing curricula across secondary and higher education levels in the Philippines and other multilingual nations.

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APPENDIX A

Post hoc Tukey HSD Test Results

Pairwise Comparisons of FCCs	Mean Difference	Standard Error	HSD	95% Confidence Interval		Critical Mean	*p*-value
				Lower Bound	Upper Bound		
Verb-controlled *that*-clauses* versus Verb-controlled *wh*-clauses	5.45	0.35	15.69	3.9781	6.92	1.47	*p*<.00
Verb-controlled *that*-clauses* versus Adjective-controlled *that*-clauses	6.37	0.35	18.35	4.9041	7.84	1.47	*p*<.00
Verb-controlled *that*-clauses* versus Noun-controlled *that*-clauses	5.29	0.35	15.22	3.8181	6.76	1.47	*p*<.00
Verb-controlled *that*-clauses* versus Noun-controlled *wh*-clauses	5.90	0.35	16.96	4.4201	7.36	1.47	*p*<.00

Note. The asterisk written after FCCs means that their frequencies of use significantly differ at the *p*<.05 level from the frequencies of use of another but different FCCs.