CamTESOL Regional ELT Research Grant Paper

An Investigation of Nominalization and Lexical Density in Undergraduate Research Proposals

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Academic writing is considered an essential skill for academic success not only for undergraduate study but also for students' further education and professional development. This writing genre has certain characteristics often lacking in students' research writing. This study explores two characteristics in students' research proposals, nominalization and lexical density (LD), after the students completed courses on academic writing and Second Language Research (SLR) in their second year at a Vietnamese pedagogical university. It also investigates the effectiveness of writing training in increasing students' performance regarding the use of given features. The findings, obtained from analyzing students' proposals and recorded interviews, suggest that students lacked awareness regarding features of academic writing and not much attention had been paid to linguistic aspects, though explicitly taught, when writing the proposals. The implications of this study will be relevant to academic writing teachers and course designers, as well as language teaching researchers.

Academic writing is the key to students' academic success in both their educational pursuits and their research publications. It has been noted that students even at the doctoral level struggle with this genre (Monceaux, 2015) and demonstrate considerable difficulties distinguishing spoken language from academic writing (Gilquin & Paquot, 2008). This implies the need to raise students' awareness to better support them in their tertiary education.

There is no one single definition of academic writing that is agreed upon. However, it can be seen as having a "formality of tone, complexity of content, and degree of impersonality of stance" (Snow, 2010, p. 450). To be more specific, academic writing is marked as being concise and information-packed (Snow, 2010) and distinctively formal due to the use of the passive voice, nominalization, concise vocabulary as well as other grammatical features (Hamp-Lyons & Heasley, 2006). In this research, the definition of academic writing is confined to formal writing in assignments and research produced by Teaching English as a Foreign Language (TEFL) trainee teachers.

Among the features of academic writing are nominalization (Biber & Gray, 2013; Snow & Uccelli, 2009) and lexical density (henceforth LD), which are crucial in creating a quality piece of academic writing. Nominalization is defined as “the process of forming a noun from some other word class or the derivation of a noun phrase from an underlying clause” (Crystal, 2008, p. 328), and LD is “the ratio of content words in the total number of words in a text” (Alami, Sabbah, & Iranmanesh, 2013, p. 5366). The significance of nominalization and LD in academic writing was also confirmed in Fang (2005), Kazemian and Hashemi (2014), and Gao (2012). It was found that students’ lack of understanding of these features can pose significant obstacles in understanding academic texts (Fatonah, 2014). Nevertheless, research into these two features is still limited. At this point, it is useful to look at how nominalization and LD have been studied.

Nominalization and LD

Nominalization is essential in academic writing because it enables the writer to pack information into the text (Fang, Schleppegrell, & Cox, 2006) and to “maintain an impersonal tone” (Baratta, 2010, p. 1017). This feature has been researched in a variety of ways in recent years. For instance, Kazemian and Hashemi (2014) studied nominalization as part of grammatical metaphors in scientific and political texts. They argued that nominalization is a “prevailing feature of both scientific and political texts” (p. 216). In addition, Fatonah (2014) investigated students’ understanding of nominalization in scientific reading passages, claiming that students do not have adequate knowledge of nominalization for scientific text comprehension. Therefore, Fatonah proposed that teaching and learning should focus on raising students’ awareness of nominalization in scientific texts.

Holtz (2009) analyzed abstracts and research papers in four fields and concluded that nominalizations are used more frequently in abstracts than in articles. Additionally, Gentil and Meunier (2013) reported similarities and differences between French and Spanish students’ use of nominalization. They asserted that students generally increased nominalization in their writing as the school year progressed and nominalization could be a fairly reliable criterion to assess students’ academic writing improvement. Research on nominalization in different types of texts such as those found in books on applied linguistics and biology (Jalilifar, Alipour, & Parsa, 2014), as well as IELTS writing tests (To, Le, & Le, 2013) was also conducted. It was affirmed that nominalization is closely related to LD (Mahbudi, Mahbudi, & Amalsaleh, 2014).

LD is another distinctive feature in academic writing. The higher LD a text has, the more content words (nouns, verbs, adjectives, adverbs) it includes. Despite its significance, LD has mainly been investigated in studies regarding spoken and written discourse (Alami, Sabbah, & Iranmanesh, 2013; O’Loughlin, 1995; Wu & Zou, 2009). Alami, Sabbah, and Iranmanesh (2013) investigated the LD discrepancy between male and female speakers and concluded that no remarkable difference was found in the two genders’ speeches but longer discourse has low LD and vice versa. Cummings (2003) studied the variation of LD in different text types, claiming that LD can be utilized as an indicator of genres. Studies on LD in academic writing are, however, rather limited.

Towards a Holistic View of Academic Writing

Recently, LD has been explored in combination with other text components. For instance, Gao (2012) analyzed nominalization and LD in writing produced by native English-speaking students and their Chinese counterparts on an English for Medical Purposes course, using Hallidayan Functional Grammar as a framework for analysis. Results showed that the Chinese medical writers used nominalization less frequently than the native English writers and LD was

lower in non-native writers, resulting in a lower degree of formality in their writing. Gao concluded that Chinese students need more support regarding features of academic writing. Mahbudi, Mahbudi, and Amalsaleh (2014) also explored the difference in nominalization frequency and LD between English and Iranian writers in medical abstracts, concluding that abstracts by non-native writers had a lower nominalization and LD rate and that a formal academic writing training with a focus on nominalization should be implemented.

Apart from these studies by Gao (2012) and Mahbudi et al. (2014), most research has looked separately at nominalization or LD in different types of texts ranging from research articles to scientific and political texts. Little has been done in the social sciences field, more specifically with TEFL students' research proposals. Recent studies (Biber & Gray, 2013; Fatonah, 2014; To et al., 2013) have addressed the two features linguistically, but they have not linked the issue of nominalization and LD to teaching students to write and do research in their L2. This paper hence aims to fill this gap by simultaneously investigating nominalization and LD in students' research proposals to identify and address issues in their writing. This investigation therefore assists students in doing L2 research as well as better prepares them for further academic pursuits. It also explores the effectiveness of writing training on the students' perception and performance, which is necessary according to previous research (Gao, 2012; Mahbudi, et al., 2014), but has yet to be investigated through empirical studies.

This article explores nominalization and LD in depth and holistically in the context of Vietnamese pre-service teachers' research proposal writing. The findings will supply teachers with an insight into students' perceptions of what is expected of them as well as how to better assist them toward success in writing academically. This study therefore contributes to the growing and important body of research into these academic writing features, and helps to make links between the linguistic features and teaching practice.

The Present Study

Research Questions

This study aims to answer the following research questions:

1. How do Vietnamese undergraduate TEFL students use nominalization and LD in their research proposals after studying in two second-year academic writing / research courses?
2. What are students' perceptions of academic writing, nominalization, and LD at the end of their second year?
3. How do students' perceptions and use change after an intensive training program on nominalization and LD in their fourth year?

Background to the Study

This research was conducted with a group of six Vietnamese student-participants who were studying for a BA degree in TEFL at a pedagogical university in Vietnam. The participants were recruited on a voluntary basis from a cohort of BA TEFL students who the first author taught, as a homogenous sampling would allow for in-depth analysis of the context and sub-group (Dörnyei, 2007). These participants were invited via an e-mail that stated that participants from different project groups were encouraged to take part in the study.

The BA degree course lasts four years and is divided into eight semesters. Academic writing was taught to these undergraduates in a required course named Writing 4 (also the name of the coursebook used for the course) in the second semester of their Year 2. This course provided students with the necessary writing skills for academic purposes, and nominalization and LD were included in a unit about academic language. At the same time, students were introduced

to Second Language Research (SLR), which is a mandatory course providing students with basic knowledge of how to do research in English. By the end of the SLR course, students have to submit a research proposal (around 3,000 words) in groups of three or four as their final assignment, with formal academic writing being an assessment criterion. Students' proposals at this stage comprise a complete introduction, literature review, and intended methodology for research. Procedures and findings are only tentative. The writing of research proposals in Year 2 is also aimed at preparing students for their individual thesis proposal and thesis writing at the end of Year 4.

From teacher feedback and discussion over the years, the researchers noted, however, that students constantly struggled in writing their proposals and theses. This is despite the fact that academic writing is becoming even more critical with the introduction of the National Foreign Languages 2020 Project (Project 2020) targeted at raising teaching quality by improving pre-service and in-service teachers' language competence and teaching methodology. As part of the Project 2020 requirements, teachers of English in Vietnam must achieve a C1 level on the Common European Framework (CEF; Council of Europe, 2001) upon graduation. This may be impossible to achieve without developing students' competence in academic writing

Procedures of Data Collection and Analysis

Both quantitative and qualitative data collection methods were used in this study so that not only features of the participants' academic writing could be analyzed statistically for comparison purposes, but also participants' perceptions of writing could be explored. This mixed methods design allowed one set of data to help explain the other set (Creswell, 2014). Data were collected in two phases.

In Phase 1, students' group research proposals were collected at the end of Year 2 and six participants from six groups were invited to one-to-one semi-structured interviews (see Appendix A for interview questions). The proposals were run through the Adelex Analyser (ADA), and the result was represented on a percentage scale. Subsequently, CLAW POS5, a highly reliable word tagger (Ooi, Tan, & Chiang, 2007), was employed to tag part-of-speech of all words in the samples. (See Appendix B for links to these tools.) The tagged samples, excluding proper nouns, were then checked manually for nominalization by checking suffixes listed in Gentil and Meunier (2013).

Phase 2 took place when the participants were halfway through their Year 4. These participants received a training program focusing on nominalization and LD before writing their thesis proposals. These proposals were also collected and analyzed, as were the group proposals. This was then followed by another semi-structured interview with each participant to record changes in their perceptions (if any). All interviews were conducted in Vietnamese so that the participants could easily express themselves. The recorded interviews were then transcribed and cross-analyzed for significant themes. The students were coded as Participant 1 to Participant 6 to preserve anonymity. Specific quotes from the participants were translated from Vietnamese to English to support the analysis.

Training

Training was conducted in a separate session outside of the class when the participants were halfway through their Year 4. Materials for training were designed and compiled by the authors comprising five activities: first, exploring participants' previous assumptions of academic writing; second, explicit nominalization and LD teaching; third, controlled practice in

nominalization; fourth, controlled practice in LD; fifth, self-editing a literature review for nominalization and LD (see Appendix C).

Results and Discussion

Pre-Training Performance

After running the participants' group proposals through ADA, the average LD obtained from these proposals ranged from 27.84% to 39.17 % and the mean was 32.29% (see Table 1). In other words, there were on average 32 content words (nouns, verbs, adjectives, adverbs) per 100 words written by the participants with their Year 2 groups.

Table 1

LD in Participants' Group Proposals (Phase 1)

Participants	1	2	3	4	5	6	Mean
Proposal 1	32.58%	31.76%	31.68%	36.71%	39.17%	27.84 %	33.29%

As asserted by To, Fan, and Thomas (2013), LD in reading texts for non-native English speaker undergraduates is around 46.3%. This means a gap exists between what the participants are expected to show and their actual ability, which may be traced back to their inability to make a clear distinction between spoken and written registers (Gilquin & Paquot, 2008) or their overuse of phrasal verbs instead of equivalent one-word verbs in their proposals. In the following examples taken from the research proposals, the students used phrasal verbs where one-word verbs would be more appropriate:

Participant 1: This encourages researchers to *work out* some other authentic techniques solving this problem. (one-word option: devise)

Participant 5: She *looked for* evidences of positions by analyzing the videos that were recorded the lessons. (one-word option: sought)

Another reason for the low LD could be the participants' extensive use of the active voice rather than the passive voice due to their mother tongue interference. In addition to LD, nominalization seemed to pose another problem for these participants. The results are summarized in Table 2 below.

Table 2

Nominalization in Participants' Group Proposals (Phase 1)

Participants	1	2	3	4	5	6	Mean
Proposal 1	3.42%	5.22%	5.04%	4.81%	3.96%	3.88%	4.39%

Holtz (2009) pointed out that the percentage of nominalization in linguistics research articles is 10.97%, but as observed from Table 2, nominalization frequency in the participants' first proposals was between 3.42% and 5.22% and the mean was 4.39%. This suggests that the participants' use of nominalization was rather limited. The inadequacy of nominalization, together with the previous issue of low LD due to the participants' extensive use of phrasal verbs, clarified the current level of the participants in academic writing. With a closer look into their perceptions obtained from the first interview, it was possible to gain a better grasp of the participants' difficulties to more effectively support them.

Pre-Training Interviews

Participants' perceptions of academic writing. Analysis of the pre-training interview transcripts showed that the six participants identified academic writing with field-specific terms, use of certain structures, and "difficult and less common words" (Participant 6), which are all valid perceptions. As Participant 1 stated: "Research writing means using academic words and structures." Meanwhile, some of the participants viewed academic writing as rigid and formal, as asserted by Participant 2: "It should conform to the rules of academic writing and writers should use more advanced vocabulary. We cannot use daily language."

Apart from mentioning the lexical differences, the participants appeared to have very little idea about academic writing conventions, including those explicitly taught in Writing 4. Only one participant mentioned impersonality and using the passive voice. While the participants demonstrated basic understanding of academic writing, they seemed ignorant of other linguistic features. This also highlights both the participants' lack of awareness and the limitations of their previous writing instruction.

Participants' use of nominalization and LD. In the coursebook *Writing 4*, the participants were introduced to features of academic writing; nominalization is explicitly included and explained. Though the notion of LD was not introduced, it is related to the use of single-word verbs listed in the coursebook. Nominalization and LD, however, appeared to be neglected when the participants, together with their groups, wrote their proposals. Participant 2 confirmed that "we did not know what LD or nominalization were, we just wrote down what we thought was correct." Although Writing 4 was taught alongside SLR, and these two subjects were expected to complement each other to facilitate participants' proposal writing, only one participant claimed to be able to apply what she learnt about writing the proposals. "Writing 4 was really helpful for us. We learnt how to cite works and how to paraphrase. We could use a lot paraphrasing. We remembered to avoid plagiarism, too" (Participant 6).

Interestingly, two participants acknowledged that they were aware of using nouns and content words. Participant 1 stated, "I myself like to use nouns in writing. I also try to use more noun phrases and content words." Participant 3 stated, "We often used more nouns because it sounded more academic than using verbs." This is possibly the reason why these specific participants' group proposals had higher nominalization and LD frequency compared to other papers. Others, on the contrary, failed to see the link between these two subjects: "We could not use much knowledge from Writing 4 for writing research. Most of the time, we only read model research" (Participant 4). It is thus not surprising that the participants found these two features troublesome, as Participant 6 claimed: "I find it really hard to use nominalization. Now I know about LD, but I still think that it is really, really complicated."

Participants' writing and editing process. Recognizing vocabulary as the most distinctive feature of academic writing resulted in the participants paying more attention to word choice. That explains why most of their difficulties in the writing process were related to lexical issues: "The most difficult thing is how to choose words to express our thoughts, how to choose short and precise words so that our writing is simple, yet easy to understand" (Participant 4).

The interviews also revealed that the participants put more emphasis on the proposal content and grammar rather than on language use. This explains why they tried to "make the writing sound good" (Participant 1). Writing and editing were only based on participants' feelings rather than based on a clearly stated list of criteria. Participant 2 stated "We write in a way that we feel good about and we shorten the lengthy sentences. Academic writing was quite new to us at that time, so we just edited the writing intuitively."

In conclusion, the interviews revealed a lack of awareness of academic writing among the participants. They often viewed academic writing as only having specialized vocabulary and structure rather than having certain linguistic features, which resulted in a limited use of nominalization and LD in their research proposals. This encouraged the first author to conduct a training course to raise the participants' awareness of nominalization and LD by making these features explicit in the training program.

Post-Training Results

The data collected after the training indicated that most participants' individual proposals had a higher LD than their group proposals. As can be seen from Table 3, the LD in participants' individual proposals ranged from 35.32% to 42.78% and the LD in individual proposals was higher than that in the first proposals, except for those of Participants 4 and 5.

Table 3

LD in Participants' Proposals

Participants	1	2	3	4	5	6	Mean
Proposal 1	32.58%	31.76%	31.68%	36.71%	39.17%	27.84%	33.29%
Proposal 2	42.17%	41.64%	35.32%	35.61%	38.88%	42.78%	39.37%

Nominalization, however, appeared to be more difficult to increase, as shown in Table 4. Three out of six participants produced proposals with a lower rate of nominalization compared to the group papers. A slight increase was observed in two of the papers (Participants 1 and 3). Noticeably, Participant 2 had a nominalization rate of 2.8%, which was just over half the rate in her first group proposal. This could be due to her paying attention to increasing LD. In comparison to her group proposal, Participant 4's individual proposal had a lower nominalization and LD. In the post-training interview, she stated that she mainly focused on finding the precise vocabulary and correcting word choice errors instead of nominalization or LD. She also pointed out that she forgot about LD when writing, thinking it was not so important.

Table 4

Nominalization in Participants' Proposals

Participants	1	2	3	4	5	6	Mean
Proposal 1	3.42%	5.22%	5.04%	4.81%	3.96%	3.88%	4.39%
Proposal 2	4.085%	2.8%	5.19%	2.711%	2.306%	7.86%	4.16%

Participant 6's paper had a rather exceptional rate of nominalization of 7.86%, which was the nearest to Holtz's (2009) nominalization rate of 10.97%. In the interview, the participant emphasized that she paid a lot of attention to nominalization use when she edited her proposal. This could explain why she nominalized so frequently. Other participants' difficulties may have been caused because they were quite new to research writing and they were at the very early stage of writing in the linguistic discipline. Increasing the LD, mostly by means of phrasal verb avoidance, along with boosting the number of content words, was therefore more achievable than nominalizing. A probable explanation for this could be that nominalizing requires a wider range of lexical knowledge and a higher level of linguistic competence, although nominalization may not be new to the participants: "I had known about nominalization before the training but I learned more about LD [in the training]" (Participant 2).

Post-Training Interviews

Changes in the participants' perceptions were also observed. First, the intensive training helped to foster the participants' awareness of features of academic writing. Most of them claimed that they paid more attention to nominalization and LD and they also tried to add these features into their writing, although their performance did not always reflect this. The gap between the participants' consciousness of the two features and their performance suggested that they may need more time to turn their awareness into habit.

LD in the participants' writing increased by means of limiting the use of phrasal verbs, or by the use of more content rather than function words. Some of them also showed attempts to use more nominalization as they had become conscious of its significance. However, most of them confirmed that they only paid attention to these two issues in the editing process: "When editing, I paid a lot of attention to nominalization, I used nouns wherever and whenever I could" (Participant 6).

Interestingly, Participant 6 used more nominalization but at the same time showed concern about nominalization after attending a seminar organized by the university:

In the seminar, an Australian professor shared with us that it is not always good to use nominalization. It seems that we are trying to show off, so I try to keep the balance. Sometimes I use nominalization, sometimes I use phrasal verbs.

This comment suggested that this participant had developed an acute awareness of nominalization, which led to her extensive use of nominalization when she thought that it was necessary. This is also a valid perception as overuse of nominalization may make a text problematic to readers. The participants also seemed to put thought into linguistic features in their second proposals:

I wrote it once then read more materials to copy the structure. After that, I asked the supervisor to correct it for me. I also found more good words to use and corrected any grammatical errors I made. (Participant 4)

Changes in perception led to changes in the participants' efforts to pack information into words: "There are many words that carry little content, so I tried to use words which carry more meaning so that my sentences are not too lengthy," stated Participant 1. However, evidence from analyzing the participants' papers, as well as evidence from the interviews, suggested that nominalization was a more challenging issue than LD. In the interviews, all participants subscribed to the idea that training was necessary and that an extended training program would ensure the quality of students' writing. In terms of what they want to learn more of, the participants mentioned citation, paraphrasing, and increasing the readability of their writing as well as their use of nominalization and LD.

In conclusion, the participants were at the earliest stage of writing academically and the training program enabled them to develop an initial consciousness about nominalization and LD during the editing process. It seems, however, that they still paid more attention to lexical choice, grammar, and content rather than to the linguistic side of their proposals. The findings support what Evans and Greens (2007, cited in Cai, 2013) asserted in their paper about language: that lexical issues, in particular, pose obstacles for L2 students in writing academically. When first starting to write academically, participants may not have been mindful of features of this writing genre, resulting in their focus on content rather than language use. The interviews also revealed that improving LD was somewhat achievable, while nominalization was still troublesome,

perhaps because it requires a higher level of linguistic competence. It is, hence, suggested that explicit training be used to familiarize students with writing academically and to help students form the habit of using academic writing features.

Conclusion

This research employed both qualitative and quantitative analysis of data to achieve an overview of six participants' perceptions and performance regarding the use of nominalization and LD in their research proposals. Due to time constraints, this research was conducted with a small sample size and it by no means allows for generalization. Another limitation of the research is the comparison between the participants' group proposals and their individual proposals as the contribution of each participant in group work is difficult to measure. Nevertheless, this study has provided some important insights into undergraduate students' research proposal writing. It can also be replicated to explore contextual issues related to students' perceptions in research writing, and could also be conducted with participants of other nationalities, who may experience different (or similar) problems with academic proposal writing. Furthermore, further research could be conducted regarding lecturers' perceptions and expectations so that educators can have a better understanding of their institutional situation, which could be helpful when developing appropriate measures to enhance teaching and learning.

The findings suggest that language use in general, and nominalization and LD in particular, are neglected when students first familiarize themselves with writing research proposals. It was also found that an intensive training program had a positive influence in terms of raising students' awareness and enhancing their performance. It should be noted, however, that extended training is desired to turn student awareness into habit. The interviews also revealed that regular and comprehensive academic writing training should be better integrated into undergraduate courses to support the students toward writing betterment.

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Appendix A

Pre- and Post Training Interview Questions

Pre-Training

1. Do you plan to study for an M.A.?
2. In your opinion, how is research writing different from other types of writing you have learnt?
3. What aspects of writing research do you find difficult / problematic?
4. Do you know about LD and nominalization? If yes, do you find LD difficult? Do you find nominalization difficult?
5. Did you apply what you learnt in Writing 4 (academic writing) into your proposal writing? If yes, how?
6. What are the steps you follow when writing the proposal?
7. Do you have any strategies/resources to help you improve your writing?

Post-Training

1. Has your view about writing research proposals changed after the training? (If yes, how?)
2. Did you follow the same steps (as in group project) when writing your proposal? (Clarify changes, if any.)
3. Do you think training on research writing is necessary?
4. How has the training on nominalization influenced the way you write your proposal?
5. How has the training on lexical density influenced the way you write?
6. Is there anything else you would like to learn more about research writing?

Appendix B

Online Tools for Data Analysis

ADELEX Analyser

A free tool developed by the University of Granada for counting LD

<http://www.ugr.es/~inped/ada/frecuency.php?ada=se7ifu3v5cd6un8ei801mtjum7&lng=english>

CLAW Part of Speech Tagger

<http://ucrel.lancs.ac.uk/claws/>

Appendix C

Nominalization and LD Training Activities

Activity 1: Sentences from published articles were mixed with sentences taken from students' research proposals. Students were then asked to tick the "more academic statements" and answer four questions:

- Why are the statements ticked more academic?
- What parts of speech are most common in those statements? (nouns, verbs, adjectives, etc.)
- Can verbs be used instead? Would it sound more or less academic?
- How many content and function words are there in each sentence?

The article extracts are in the field of second / foreign language teaching, which is close to the students' major.

Activity 2: The teacher introduced notions of nominalization and LD as well as their roles in academic writing. Students were asked to measure LD and identify nominalization in the sentences used in Activity 1.

Activity 3: Students practiced replacing phrasal verbs in a text by nominalization (from Hamp-Lyons & Heasley, 2012, p. 97).

Activity 4: Students compared the use of verbs in published articles and students' papers using sentences from Activity 1. This activity focuses on drawing students' attention to their overuse of reporting verbs. A table of most common reporting verbs was distributed to students (from http://www2.warwick.ac.uk/fac/soc/al/learning_english/leap/grammar/reportingverbs/).

Activity 5: Students practiced replacing phrasal verbs with single-word verbs in their group proposals and measured the LD in the rewritten version. This activity helped students to increase LD by reducing phrasal verb use.

Activity 6: Students wrote part of their literature review at home. They then met with the teacher to receive feedback on LD, and the use of nominalization and reporting verbs.