

THE LANGUAGE ECOLOGY OF GRADUATE STUDENTS: AN EXPLORATION THROUGH VOCABULARY CONTRIBUTION

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ABSTRACT

This study explores the language ecology of graduate students through vocabulary contribution. Understanding students' learning ecology may be done through the identification of pertinent sociomaterial networks with which students engage to initiate or complement learning. This study was set in an academic writing module taught by the researcher. An open invitation was extended to his students to contribute any vocabulary they encountered outside of his classroom. Along with the vocabulary contribution, students also had to provide the excerpt where the word occurred and the source-type. Contributions were made on an online Excel file. There was a total of 277 contributions made, of which 259 were unique (229 words and 30 unique strings of words). Students' contributions of strings of words were not anticipated. A majority of these contributions came from academic sources, such as research articles or book chapters, which may be a pertinent aspect of the graduate students' language ecology. Through the findings, it is recommended that English for academic purposes (EAP) or English for specific purposes (ESP) instructors identify language ecologies found in the broader university setting to glean relevant pedagogical materials that can support students' language development.

Keywords: Learning ecology; vocabulary; academic socialisation

Introduction

In recent times, there have been calls for research on students' language development to take into account engagement with social or material entities found beyond the formal classroom (Guerrettaz et al., 2021). These calls are premised on the view that an educational institution, regardless of level, presents a dynamic ecology where an array of learning opportunities may be found. Acknowledging a dynamic ecology signifies a move away from the perception that language development can take place in a stable and laboratory-like setting, such as the classroom, where the language instructor introduces interventions to improve students' communication ability (McKinley, 2019; Rose, 2019). By taking the stance that language development can take place in a dynamic setting, it becomes feasible to consider language knowledge and skills as having transformative possibilities, instead of simply transmitted from instructor to student. Whilst there is a growing acceptance that the processes and output of learning should be dynamic, such as that reported by Tarrayo et al. (2021), there remains a research gap, especially with regards to how an ecology of language learning in the university setting looks like.

For graduate students, it is crucial to understand how language development may be facilitated by settings outside of a formal classroom, especially since these students are expected to progressively socialise into their respective disciplinary circles. According to Morita (2004), academic socialisation "is not simply a matter of acquiring pre-given knowledge and sets of skills but involves a complex process of negotiating identities, cultures, or power relations" (pp. 574-575). The process of academic socialisation is further complicated by the need for students to meet university requirements and to cope with the disciplinary expectations of a developing scholar (Seloni, 2012). Unfortunately, opportunities for graduate students to engage in learning processes supportive of their disciplinary socialisation may be restricted due to the prevailing deficient approach in the teaching of English for academic purposes (EAP) (Belcher, 2006; Loo & Sairattanain, 2021; Wingate & Tribble, 2012). This could be partially due to the prevailing gaps in knowledge regarding the language experiences of graduate students in their studies, especially informal learning experiences (Tobbell & O'Donnell, 2013). Hence, to address the gaps concerning the learning ecology and the language experiences of graduate students as well as to counter the deficient approach in EAP pedagogy, this study aims to explore graduate students' engagement with the English language through their contribution of vocabulary encountered beyond an EAP course. Besides illuminating the educational ecology of graduate students, this study also hopes to reveal that language development does not comprise simple pedagogical recipes (Mercer, 2011).

Habitus: Learning Ecology as Dynamic

According to Smith (2003), it is useful to understand a learning ecology by referring to Bourdieu's (1990) discussion of habitus. In brief, habitus is conceptualised as a

sociocultural-constructivist structure embedded within society or a setting. This structure informs how meanings may be constructed and understood and can be potentially reconfigured to accommodate potential sociocultural shifts (Reay, 2004). Habitus exists at different levels of society, such as at the community level, at home, at the workplace between colleagues, and even in educational institutions. In the context of educational institutions, Smith (2003) discusses schools as settings that provide a habitus with the propensity to inform how students, teachers, and other school personnel should think and act, yet at the same time, the habitus found in a school setting may be continually re-constructed. In other words, the habitus of an educational setting will shape the understanding and the implementation of teaching and learning practices, as well as the perception towards educational artifacts. As such, pedagogical processes that are typically seen as being a convention in a particular education setting might be perceived differently in another socioculturally distinct educational setting. This problematises what may be considered good educational practice, because what may be valued in a particular setting may be received otherwise in another (Gourlay, 2017).

Essentially, viewing learning as taking place in an ecology consisting of social and material entities that are valued differently diminishes the perception that knowledge is the product of a linear or two-way transaction. Instead, what is proposed is the “conception of the learning environment as a complex adaptive system, of the mind as the totality of relationships between a developing person and the surrounding world, and of learning as the result of meaningful activity in an accessible environment” (van Lier, 1997, p. 783). By residing in an educational ecology, students need to hone skills to interact with different social and material entities. This interaction, however, does not necessarily yield a definite educational product or academic achievement; instead, students may hone what van Lier (1997) refers to as affordances, which are “signs that acquire meaning and relevance as a result of purposeful activity and participation by the learner and the perceptual, cognitive, and emotional engagement that such activity stimulates” (van Lier, 1997, p. 783). This is demonstrated by a study by Peters and Romero (2019), where affordances in a distance online education setting were demonstrated through different types of engagement, such as identifying social networks where educational support may be found, or the linking of various educational and professional tasks for the purpose of knowledge or skill transfer and application. These engagements were deemed crucial as they continuously shaped the agency and motivation of the students throughout their educational journey (Jiang & Zhang, 2019).

Development of Language in the University Ecology

Being aware of the network of meanings present in an ecology requires students to have symbolic competence. Kramsch and Whiteside (2008) discuss that symbolic competence comes from the “acute ability to play with various linguistic codes and with the various spatial and temporal resonances of these codes” (p. 664). In a university setting, these linguistic codes can come in the form of distinct languages spoken, which

is becoming common due to international student mobility, as well as the prevalence of English as a medium of instruction even in contexts where English is not spoken (Ou & Gu, 2020; Simungala et al., 2021; Sung, 2020). Distinct linguistic codes may be used to better understand instruction and even socialise with others (Tarnopolsky & Goodman, 2014). Nonetheless, the structure of a university ecology should not be restricted only to distinct linguistic codes used for communication between students and instructors. There are other variables that may affect how meanings are derived, or how meanings may be produced. In the socialisation of university students, especially those who speak English as an international language, the availability of space where these codes can be used is also crucial. This may be viewed as a space receptive towards a particular community of practice and a site where academic socialisation and exchanges are supported. Soltani (2018) conceptualises this as supporting the “interplay between physical and mental spaces wrapped around all socio-academic relations” where those inhabiting or coming into this space “master the norms, ideologies, expectations of the academic (conceived) space by strategically negotiating their current space norms with their former ones” (p. 22). It is through such spaces found in the university ecology where students are able to put to use processes of schooling that they already know and that they have learned, all of which may contribute to students’ future interactions with community members from their specific disciplinary circles (Canagarajah, 2018). For international students, this may also involve the familiarisation of “the new dynamics of the writing, reading and speaking practices of their fields” (Seloni, 2012, p. 51). This familiarisation is akin to affordances, as mentioned earlier, where the learning prospects of students are heightened as they are able to identify and maximise language learning opportunities. For instance, being able to draw together feedback from various sources and modes to spur language development (Kim, 2018), or honing self-regulated strategies to explore technology helpful to the process of writing (Kessler, 2020), or even participating in various workshops or seminars that offer academic development pertinent to their graduate studies (Sanscartier & Johnston, 2021). The study of ecology in an education setting, thus, is the examination of structures with the entities within them interact and subsequently shape various educational processes and products. These structures and their entities are all interdependent at the social, physical, and also symbolic levels (van Lier, 2010).

The Study

Given the dynamism of the language learning ecology in a university setting, the study is undergirded by the framework of qualitative corpus analysis. According to Hasko (2021), this framework recognises the dynamism of language use through its openness in accepting linguistic representations of different “modalities, genres, discourse communities, and settings” (p. 3), all of which may be of different lengths. Its comprehensive inclusion of varied data types stems from its interest in “describing and interpreting the complex nature of human communication” (Hasko, 2021, p. 4). As a result, the annotation and interpretation of corpus data will be shaped by the inherent

nature of the data without any preconceived notions or expectations for what the data should look like. This takes after a grounded theory approach, which focuses on discovering the characteristics or relationships emergent from data or observations (Aldiabat & Le Navenec, 2018).

Utilising this framework is appropriate for the scope of this study, as graduate students are residing in a complex learning ecology where academic socialisation processes are taking place. When socialising, graduate students will require acceptable capital to support communication, one of which is vocabulary (Durrant, 2016). Academic vocabulary for graduate students is important because they are resources to support students in their writing of complex research papers (Cargill et al., 2018; Casal & Lu, 2021). Nonetheless, as discussed earlier, knowledge regarding graduate students' learning ecology, which includes their academic socialisation processes, remain minimal (Tobbell & O'Donnell, 2013).

Participants and Study Site

This study employed convenience sampling to invite potential participants from a module taught by the researcher in the first semester of the 2020-2021 academic year. The module was an intermediate-level academic writing class offered by an English and communication centre at a public university in Singapore. There were 40 international students enrolled in this module. A majority of the students were from East Asia, with the exception of an Indonesian and an Iranian student. The students were either a master's or PhD degree in different disciplinary areas, with a bulk of the students in the arts and social sciences, and five from either the engineering or science faculty. For many of the students, it was their first time being in an educational setting where English is the main medium of instruction. Prior to commencing their programmes, all the students had taken a standardised English test (IELTS or TOEFL) in their home countries and had met the general university admissions requirements (an overall band of 6.5 for IELTS, or 92-93 marks for internet-based TOEFL). In general, these students were able to communicate competently to participate in classroom activities. Nonetheless, their academic writing skills could still be further improved, especially those who were expected to publish their research work.

Due to the pandemic, this module was conducted online. Given that an online setting may diminish the social presence of the students and the instructor, the researcher decided to create an online vocabulary resource bank, where students can participate by contributing words. It was hoped that this would help establish a virtual social presence where there can be a form of interaction between students and the instructor (Phirangee & Malec, 2017). This online resource bank, which is the study site, may also address other issues affecting EAP courses for graduate students, aside from affording insights into the language ecology of graduate students. Some of the issues are that conventional EAP materials may not reflect sophisticated academic vocabulary commonly found in research papers, thus not providing an authentic picture of their language or even learning ecology. Furthermore, even if there were advanced academic

vocabulary in EAP materials, their occurrences may be too infrequent to prompt incidental learning (Skoufaki & Petrić, 2021). Consequently, studies have demonstrated how EAP instructors could include students' selections and contributions of vocabulary in the creation of more relevant materials (Towns, 2020).

Data Collection

The tool utilised to explore students' ecological systems and environments in higher education needs to be broad in order to be receptive to the variables affecting their experiences, whether direct or indirect (Kitchen et al., 2019). As discussed earlier, vocabulary is pertinent for the success of academic socialisation of graduate students. The vocabulary that these students encounter will also depict the scope of their learning ecology (Seloni, 2012). Hence, to be receptive towards these students' engagement with vocabulary, an online vocabulary resource bank was created on a shared Excel file.

At the beginning of the semester (August 2020), the researcher invited students to contribute any words they encountered. There were no conditions for the type of contribution expected, given that this study takes on a grounded approach through qualitative corpus analysis and that the researcher was interested to know the broad scope of students' language use outside of his module. Students could contribute until the end of the semester (November 2020). To contribute, students had to list the word, the excerpt where the word was used, and the source type (e.g., title of a research article; link to a webpage or online forum; a conversation had with other lab partners, etc.). The students' contributions were then converted into activities such as crosswords, flashcards, and critical thinking exercises. To lessen students' being potentially inhibited from contributing, their contributions were not graded. Aside from collecting students' contributions and creating relevant tasks, students' views were also collected through an open-ended survey. Similar to the contribution of vocabulary, this was done through an open invitation. The survey is a vital element, given that a qualitative corpus analysis will require other complementary data sources to offer additional insights into the data being examined (Hasko, 2021).

Data Analysis

For the study, a qualitative corpus analysis (grounded approach) is employed. Because this study is exploratory, it does not have any preconceived notions about the structures, social, and material entities found within the graduate students' learning ecologies that may shape vocabulary encounters (Hasko, 2021). Hence, the data, i.e., contributed vocabulary, were analysed descriptively in two distinct ways. First, a descriptive account of the source of contribution would be provided. Second, students' contributions were categorised with the Compleat Lexical Tutor (v.8.3) (Cobb, n.d.), a website that offers free analysis of concordance, vocabulary profile, and vocabulary exercise creation. Specifically, words were compared against the Academic Word List (AWL) to determine their levels of complexity. The students' views about the experience

of contributing were examined according to Braun and Clarke’s (2006) thematic analysis. The familiarity of qualitative data would be achieved through iterative reading, followed by the proposal of initial codes. From these codes, potential themes were suggested and relevant data collated accordingly. Next, the themes were reviewed to ensure that a thematic map could be derived. Lastly, the themes were defined and explained with suitable extracts taken from the qualitative data. The students’ views were used to address the requirement of a qualitative corpus analysis, that is, as another complementary data to provide more information.

Findings

As the current study is interested in students’ vocabulary encounters, the focus and expectation of the data were on contributions of single-word units. However, there were several contributions in the form of strings of words (lexical bundles). Since multi-word contributions were few and not anticipated, they were analysed qualitatively by categorising them according to their usage. Furthermore, since this study takes on a qualitative corpus analysis, these data were not discarded; instead, they were treated as naturally occurring data (Hasko, 2021). In the following parts, details about the contributions and their descriptive analyses are discussed.

Figure 1
Screenshot of the online Excel file

	Word	Context (Sentence or paragraph where word or phrase appears)	Source
1			
123	caveat	In addition, it is important to keep in mind two caveats regarding the steps we describe in Figure 1.	http://doi.org/10.2307/23044045
124	per se	It seems to me that the relationship in question is not causal, per se, but rather one of hypothetical measurement.	http://doi.org/10.2307/23044045
125	accentuate	These statistics accentuate that it is vital for organizations to integrate mobile applications into their channel strategies.	http://dx.doi.org/10.25300/MISQ/2015/39.2.08
126	patronize	We define mobile application loyalty as the degree to which a user has a deeply held commitment to rebuy or repatronize a mobile application.	http://dx.doi.org/10.25300/MISQ/2015/39.2.08
127	anchor	Because Winer's anchor points model is defined by using relative error, it is not usually appropriate.	http://doi.org/10.2307/3172845
128	milestone	Campbell and Stanley's (1963) paper was a milestone in the experimental tradition.	https://doi.org/10.5465/amr.1985.4277939
129	notoriously	Regression coefficients are notoriously subject to shrinkage.	https://doi.org/10.5465/amr.1985.4277939
130	shed	Airbus has said it needs to shed 15,000 posts worldwide.	cna.asia/2HnaMzO

Figure 1 presents an illustration of the online vocabulary resource bank on Excel. As indicated, students presented the word, the context of occurrence (excerpt), and the source.

Table 1
Sources for contribution

Source Type	Number of Contribution (Words or Phrases) from Source Type
Academic Articles	260
Use of word or phrase in a general setting	5
Websites (discussion thread/forum; online news report; feature articles; commentary)	12
<i>Total</i>	<i>277</i>

As shown in Table 1, many of the contributions came from academic sources. There were only 12 contributions from websites and five from general use of words. From these different sources, students contributed a total of 277 words and strings of words. Out of the total, there were 259 unique contributions (repeated contributions of the same word were counted only once), with 229 words and 30 strings of words.

Table 2

Descriptive analysis of excerpts

Total number of words in all excerpts	4893
Average length of excerpt	15.84 (Standard Deviation = 6.37)
Shortest excerpt	0 words
Longest excerpt	39 words

The excerpts that came along with the contributions were also descriptively analysed. As reported in Table 2, there were 4893 words in all excerpts combined, with an average length of 15.84 words per excerpt. The shortest excerpt contained 0 words whilst the longest excerpt contained 39 words. Next, word types were analysed with the Compleat Lexical Tutor (v.8.3). As shown in Table 3, K-1, K-2, and AWL words came to a total of 19. Many of the contributed words were those in the off-list category, which contains proper nouns, unusual words, or specialist vocabulary, amongst others (Cobb, 2004).

Table 3

Examples of word types

Level	Types (%)	Example Vocabulary
K-1	1 (0.44)	Affairs
K-2	8 (3.49)	accustomed; customary; harbour; nailed; prompt; steep; tailor
AWL	10 (4.37)	aggregate; arbitrary; compound; discretion; forthcoming; inhibit; invoke; notwithstanding; primacy
Off-List	208 (90.83)	accentuate; adept; caveat; coalesce; crux; delinquency; discern; emanating; formidable; germane; instantiate; jumble; liability; lucidity; nascent; obtrusive; perturb; predilection; retrench; rudiment; stringent; stringent; trivial; vacillate; void; wrest; zeal
<i>Total</i>		<i>229 (100)</i>

Strings of words (lexical bundles) were analysed manually as these contributions were fewer. Strings of words were categorised based on usage, either in terms of co-occurrence or function. As shown in Table 4, there are n-grams, phrasal verbs, nouns and idiomatic phrases, and adjectives and adverbs. N-grams were contributions of words that occurred close to each other, either in a phrase or sentence. Some examples of n-grams with their context are as follows:

- Experimenters are particularly **prone** to Type III errors when they fail to sample **stimuli** in situations where it is necessary.
- Our results imply that firms can selectively reduce cross-departmental ignorance just enough to **conduce** collaboration without **imperilling** departmental specialization.

Table 4
Categories for strings of words (lexical bundles)

N-gram (13)	Phrasal (prepositional) Verb (4)	Nouns (3) / Idiomatic Phrase (1)	Adjective (3) / Adverb (6)
Prone + stimuli	Glean from	Sine qua non	De facto
Entail + tenuous	Pitted against	Odds of	Ex ante
Conduce +	Prevail over	Status quo	
imperilling	Abstracted by		In the same vein
Assuage + fidelity		To name but a few	In tandem Ceteris paribus

Aside from n-grams, there were also phrasal verbs comprised of verbs and prepositions. There were also at least three noun phrases and an idiomatic phrase, “to name but a few”, and adjectives and adverbs. Most of the nouns, adjectives, and adverbs were collocations with Latin origins, such as “*sine qua non*” (an indispensable condition; without which not) and “*ceteris paribus*” (other things being equal).

Students’ qualitative comments about contributing vocabulary were collected through an anonymous open-ended online survey. Since the survey was not compulsory, only seven students left brief comments. These comments were thematised into two categories: potential benefits of contributing vocabulary and gaining an awareness of own academic literacy skills. The first theme refers to students’ consideration of the positive outcome from contributing vocabulary. For instance, Student 2 mentioned that contributing vocabulary may help minimise the need to refer to dictionary for meaning and to develop more professional writing skills. In a similar vein, Student 4 mentioned that the contribution of vocabulary can help with remembering and organising words.

Student 2

Read faster, without a constant dictionary need/ Write more and professionally for some websites or journals

Student 4

1. Words contributed may also benefit others since they are useful for academic writing.
2. It's a way for me to memorize these words.
3. I also learn an good method to organize the words I encounter from the given excel.

The second theme is students' awareness of their own academic literacy skills, such as the challenges they face in being a graduate student (Student 6), improvements they need to make (Student 3), reactions towards their own academic skills (Student 7), and recognition of their learning process (Student 5 and 1).

Student 6

Yet, when I see the list which I contributed almost every day it gives to impressions for myself, one is good and one is bad. The good one is I feel "WOW! I have done a lot and I should be much better than before as a whole as I have studied around 300 pages weekly!"; while The bad part is "OMG! I do not know whether the University is so demanding or I am stupid, but anyway, if the entire PhD is going to be like this, I really do not know how I can manage it in long-run!"

Student 3

Avoiding contributing some very common vocabularies, I should learn to use advanced vocabulary and its accurate usage to replace them.

Student 7

Because I think it is a normal thing when doing some reading and what I need to do is to remember the meaning of it quickly. When I see the word for second time and I still don't know the meaning of it, I will feel uncomfortable and a little disapponted to myself.

Student 5

I will first guess what the meaning is based on the context. If the word doesn't impede me from understanding the overall context, I will underline it and skip. If the word is repeated multiple times in the article, I will check the meaning regardless of whether I can understand the text or not.

Student 1

When I decide to add a word to the spreadsheet, I will check the meaning of the word first and then paraphrase its meaning in my own words (though it is not required here). In doing so I can have a better understanding and memory of the word.

Aside from the qualitative responses to the open-ended survey, there were also other forms of qualitative comments that were found with the contributions. These comments took the form of emojis – a type of graphicon (Tang & Hew, 2019), punctuations that indicate affect or illocutionary force (Dresner & Herring, 2010), and students’ written thoughts. The following were retrieved from the online Excel file:

- Abstracted by/abstracted from: Confused 😬 with its many meanings, please provide examples
- granular (!? 😬)
- operationalization 😬
- fussy (vs. fuzzy)
- exogenous ≠ endogenous
- vigorous (mixed up with rigorous! 😬)

Items #1 to #3, and #6 utilised emojis, and some with punctuations (#2 and #6). For item #1, the emoji with eyes opened wide seems to complement the student’s confusion, similar to #2; nonetheless, #2 had punctuation marks ! and ?, perhaps to emphasise the extent of emotions felt towards the word ‘granular’. The emotions may be a mix of surprise and confusion (of not knowing, hence the ?) (Flushed Face, n.d.). In contrast to the emoji used in #1 and #2, #3 saw the use of an emoji with the expression of being suspicious towards something, or scrutinising something, whilst wearing a monocle (Face with Monocle, n.d.). Perhaps in this instance, the student was questioning or doubting the use of “operationalisation”. The emojis seen in #1 to #3 may appear slightly negative; Item #6, on the other hand, presented a more positive emoji – an upside-down smiley face that may reflect silliness or goofiness (Upside-down face, n.d.). Here, the student could be presenting a self-disclosure of his or her mistake of getting the words “vigorous” and “rigorous” mixed up. Self-disclosure in the use of emojis, according to Tang and Hew (2019), refers to the act of revealing vulnerability or intimate details about the self. In this case, it is the admittance of not knowing. Furthermore, as seen in the six items, self-disclosure does not always come in the form of emojis as it is also written out, as seen in Items #1 and #6.

Aside from the use of emojis and punctuation marks to symbolise affective responses, there were also cognitive responses by means of evaluating knowledge. This is illustrated in Items #4 and #5. Through these, the students compared their contributions with their own lexicon knowledge. This was done with words that sound almost the same, such as the case of #4, fussy and fuzzy, where the former is a voiceless

alveolar fricative [s] and the latter, a voiced alveolar fricative [z]. Item #5 on the other hand showed how the student indicated his or her knowledge that whilst “exogenous” may be related with “endogenous”, they are not the same (\neq) as they are complementary antonyms.

Discussion

Based on the results of this study, it appears that the ecology supportive of graduate students consists of the materials that they encounter, specifically research or academic texts. This is indicative of the affordances that graduate students have towards research texts, with which they engage cognitively or emotionally. In other words, their engagement with academic texts reflects agency in identifying learning opportunities within their own individual and contextual setting (Jiang & Zhang, 2019). The graduate students’ engagement becomes more apparent in their qualitative comments, where the interaction with these material entities prompted them to consider the prospects of contributing vocabulary and to become aware of their academic literacy skills (see discussion on development of materials by Wingate, 2018). Additionally, the students’ emotional responses were illustrated through their inclusion of graphicons and punctuations (with illocutionary force) in their vocabulary contribution (Tang & Hew, 2019).

By exploring the qualitative corpus analysis, we could posit that graduate students may be familiar with vocabulary from AWL, given the low amount of vocabulary contributed that belong to this category. The students instead paid more attention to off-list words, which may be crucial for students to master in order to demonstrate symbolic competence in their own disciplinary circles (Kramsch & Whiteside, 2008). This may also be students’ call for help in understanding how the off-list vocabulary may be used or understood (Casal & Lu, 2021; Durrant, 2016). Moreover, the strings of words contributed by students showed that they were not just noticing words in isolation, but words that occur close to each other, for instance, the n-grams that they contributed. Students’ notice of these lexical bundles affirms the study of Li et al. (2019), in which they reported that students do take note of lexical bundles from research texts for functional or structural applicability in their own writing.

The students’ contributions of off-list words sourced from research texts is also illustrative of the space where they engage with disciplinary knowledge. This exemplifies what van Lier (2004) describes as the third place, which is an intersection where students may bring together meanings from contexts which are relevant or seemingly contradictory, to become more sensitive of meanings that either align or diverge. In this current study, this third space appeared in the form of the online vocabulary resource bank. In this space, students need to be self-efficacious, as reading complex research materials requires not only an understanding of the information presented, but also an evaluation of the information in comparison to their own study. Subsequently, students can synthesise and apply what they have read with what they are studying or writing

(McCulloch, 2013). The space where students engage with academic texts also illustrates the form of academic socialisation expected in their disciplinary context.

The expectation to socialise closely with research texts may be a crucial habitus, given that these are artifacts that signify status and membership within an academic circle. Nevertheless, whilst published research or academic texts may offer a prominent space for socialisation, there is a risk that this may inhibit progress of an academic circle. In particular, there remains the risk of academic journals becoming an indisputable template in defining features and structures of a discipline. Collyer (2013) states that academic journals are indirectly and inevitably redefining research that is acceptable for scholarly dissemination; for instance, research methodology has become more homogenous instead of taking on a pluralist approach; moreover, theoretical studies have also decreased. Consequently, this may inhibit the democratisation of knowledge as the conduit that transmits knowledge as only published research articles would be upheld as irrefutable pillars for truths (Biesta, 2012b).

Hence, based on the main findings from this study, English for academic purposes or English for specific purposes (EAP/ESP) instructors should consider identifying spaces that offer opportunities for developing materials and for promoting students' self-regulated learning. First, as proposed by Towns (2020), EAP/ESP instructors could get students involved in organising materials for vocabulary learning. Students could decide on vocabulary items that they could or want to learn, and instructors themselves could also evaluate whether vocabulary recommended by EAP/ESP materials are suitable by comparing them with relevant word lists. Another method may be to get students to contribute vocabulary, similar to what has been done in the current study, or to get students to think about the use of vocabulary, such as that was discussed by Casal and Lu (2021). Next, having students take an active role by thinking about vocabulary choices or deciding other types of language use or communication could promote self-regulation. Self-regulation amongst graduate students is crucial, given that they will come across numerous situations that require them to make independent judgements regarding language use (Jiang & Zhang, 2019). EAP/ESP instructors should consider creating such a space where guidance can be provided for language use in academic socialisation, and not rely on simple recipes for vocabulary instruction (Mercer, 2011). Activities such as noticing and applying writing features (McCulloch, 2013), as well as responding to feedback in writing (Loo, 2021) may contribute towards students' development of academic literacy (Wingate, 2018).

Conclusion

Future studies may consider other forms of language use in students' ecology. For instance, the use of distinct linguistic codes or languages when interacting with different social entities can provide insights into meaning-making processes in micro-domains found in the broader university landscape. It may also be useful for researchers to trace the successful and unsuccessful uses of language in different domains of interactions, as well as through time. This could potentially address a limitation of this study, that is, the

lack of evidence showing whether the vocabulary contributed by students were used successfully, or more importantly, how they were learned correctly for academic purposes. Notwithstanding the lack of impact from students' vocabulary contributions, viewing students' broader learning environment from an ecological perspective recognises that learning is sociomaterial, comprised of an array of entities in which students may find learning opportunities. Taking such a view challenges the conceptualisation of learning as a linear or even dialogic process restricted between students and their instructors (Damsa & Jornet, 2016). Such an approach also reflects a truer nature of language use, which is oftentimes messy, unlike the laboratory setting or intervention-type approach that many studies in applied linguistics purport as natural or effective for language development (McKinley, 2019; Rose, 2019). Furthermore, an ecological approach positions learning experiences as unique, which is common for graduate students (Tobbell & O'Donnell, 2013), as these students are invested in distinct academic endeavours in disparate yet symbolic learning contexts (Seloni, 2012; van Lier, 2010). Hence, inviting students to share some aspects of their learning ecology in an EAP/ESP setting offers the possibility of a more coherent picture of the learning trajectories of students, especially those pursuing their graduate degrees. This is vital, considering such pedagogical efforts remain at dismal levels (Peters & Romeo, 2019), as there is still a strong preference for the tradition of teacher-directed teaching, especially in the case of EAP/ESP (Loo & Sairattainain, 2021). It is hoped that this study presents an alternative teaching method for academic vocabulary that others may consider, given that it has the potential of ensuring the relevance of materials. After all, having students bring in what they have observed in their own learning ecologies is reasonable and logical, especially as students come from different disciplinary backgrounds. Predetermined materials may not sufficiently address their various needs and may prevent the students from applying the richness of contexts that they can bring to the table. Logic, which Biesta (2012a) considers as common sense in education, is after all to recognise that the purpose of education is to find ways where instructors can support and facilitate students' learning.

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