EXPLORING THE USE OF GRAMMATICAL METAPHOR IN PAKISTANI ESL LEARNERS' ACADEMIC WRITING: A FOCUS ON NOMINALIZATION

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ABSTRACT
This article aims to explore the use of nominalization in Pakistani ESL learners' academic writing. Following descriptive analytic approach, a general distribution pattern of nominalization is investigated within the context of disciplinary variation. Based on this general distribution pattern, the use of different features of nominalization is investigated in hundred academic texts (problem-solution essays) produced by the students of humanities and sciences at undergraduate level. From the field of humanities, students of BS English are selected while students of BS Engineering represent the field of science. An average word length is 600 words each text. Contrary to the existing literature on GM use, the analysis reveals that the use of nominalization is not in strong relation with scientific writing only. On one hand, the findings confront with the proposed view of He and Yang (2018) that the use of nominalization is not discipline sensitive. While on the other side, the results show weak agreement with them reporting that nominalized construction cannot be taken as an indicator for technicality of any text. The current study is of implication to discipline-based training of Pakistani ESL learners. Moreover, it signifies that the importance of grammatical metaphor (of which nominalization is the most common feature) in academic texts arises the need to focus on its varied forms and functions in L2 instruction.
Keywords: nominalization, grammatical metaphor, academic writing, Pakistani ESL learners, disciplinary variation

INTRODUCTION
Nominalization is regarded a typical experiential grammatical metaphor. Furthermore, it is considered as an indicator for the technicality of the text (Martin, 1993). According to Halliday (1994, p. 352), nominalization is one of the powerful linguistic resource that creates grammatical metaphor, hence it is the most common economical medium of packaging dense information (Halliday, 2004). Nominalization is also studied as a general feature of scientific discourse (Martin, 1992, 1993; Halliday, 1998, 2004; Biber et al., 1999; Charles, 2003; Banks, 2003, 2005; Biber, 2006; Devrim, 2015; Liardet, 2016). Banks (2005, p. 350) maintains that scientific writing appears with a fixed factuality, stability of thought and solidity because of the use of nominalization. In words of Baratta (2010, p. 1017), it gives an impersonal tone to the writing and it assists to maintain objectivity by eliminating human agency within the sentence. The succinct representation of processes and events as static abstract entities can be illustrated from the example (1) as cited from Halliday and Matthiessen (1999, p. 343):
Example (1) a. *They shredded the documents before they departed for the airport.*
        b. *Their shredding of the documents preceded their departure for the airport.*

      These above given statements in example (1) construe similar strand of meaning. Only they differ in their realization in (1a) and (1b). Tellingly, the sentence given in (1a) congruently realize the

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meaning through a clause complex whereas (1b) is an incongruent or metaphorical realization of similar meaning as a simple clause. Halliday (1994, p. 343) delineates congruent realization of meaning as a "typical ways of saying things" and incongruent realization is described as "not expressed through the most typical (and highly coded) form of representation" (Halliday, 1978, p. 180). Given these notions, the two clauses in example (1a) are rank-shifted into two nominal groups in example (1b) through the process of nominalization and correspondingly the hypotactic conjunction 'before' in example (1a) denoting a temporal relationship between two clauses is further verbalized as a verbal group 'preceded' in example (1b). Thereby, with the help of nominalization and verbalization, grammatical metaphor is construed.

According to MacDonald (1994), nominalizations are more frequent in hard sciences and less frequent in texts produced in the discipline of humanities. Halliday (2004) maintains that this grammatical construction in scientific discourses is not a random construction rather it is resulted due to logical representation of scientific discoveries and their accomplishments followed by a new discovery in the field. Many empirical studies supported this theory by presenting a comparison of various genre and discipline sensitive texts and occurrence pattern of nominalization (Baratta, 2010; Biber & Gray, 2013; Galve, 1998). Biber and Gray's (2013) diachronic corpus analysis revealed that noun phrases as well as nominalized construction gained a tremendous increase in academic texts over the course of twentieth century. They (ibid) attribute this towards embodiment of economy principle in the age of information explosion through digital world.

However, the prominence of nominalization as technicality indicator of scientific writing may not be definitive as postulated by Halliday (2004). This predominance of nominalization as a marker of technical academic writing was challenged in Gray's (2013) multi-dimensional analyses of grammatical constructions in varied disciplines. The results demonstrated that quantitative research papers in political science and applied linguistics yielded highest scores in the use of nominalization than the quantitative papers of biology and physics. The results declared that nominalization as associated with the dimension of academes was no longer remained a yardstick for technicality in academes. Another influential work on the similar line of thought was of He and Yang's (2018), in which they examined the correlation between text technicality and ideational grammatical metaphor. Resonating with the findings of Gray (2013), their analyses of academic texts in soft and hard sciences signified that the use of nominalization is not discipline or domain sensitive. They further assert that it is the use of verbalization which differentiates the technical texts of hard sciences from less technical and more narrative texts of the soft sciences.

Another perspective shared by researchers as well as academicians is that the nominalization used in grammatical metaphor is related with advance level of literacy of the language users (Halliday & Matthiessen, 2004). Therefore, it is expected that the proficient users can only exploit this linguistic resource to its fuller sense and second language users show little tendency to deploy this linguistic resource in their academic writing (Flowerdew, 2006; Jiang, 2015).

The diversified opinion presented through a variety of studies in the use and distribution of nominalization requires further explorations on its efficacy as an indicator of technicality in academic writing and on its domain sensitivity. The present study is an attempt to address the issue of discipline sensitivity by analyzing academic texts produced by Pakistani ESL learners.

Study Objective(s) and Question(s)

The aim of the study is to explore the use of nominalization and its general distribution in the texts of two disciplines (English & Engineering) to investigate if nominalization is discipline sensitive linguistic resource or not. For the accomplishment of this objective, following research questions are designed:

1. What is the occurrence pattern of nominalization in academic writing of Pakistani ESL learners?
2. To what extent study discipline affects the use of nominalization pattern in Pakistani ESL learners' writing?

Review of the Related Literature

Grammatical Metaphor

Halliday (1985) describes grammatical metaphor as complementary to the concept of lexical metaphor. It acts as a powerful linguistic tool and through grammatical repackaging it facilitates and expedites completion of multiple tasks simultaneously. It not only changes the dynamic state of language into static one but it simplifies the grammatical intricacy of the language by bringing forward lexically dense

entities. It also relates the lexically dense entities between clauses and within the clauses by engrossing logical relations between them and interring the reasoning to make the arguments strong and 'unassailable facts' (Martin, 1985, p. 26; Halliday & Martin, 1993). He further elaborates it dividing into two major types of grammatical metaphor i.e. ideational grammatical metaphor and interpersonal grammatical metaphor.

Grammatical and Lexico-Grammar Continuum

Halliday (1985) introduces this concept of GM in a historical ground of 'rhetorical transference— metaphor, metonymy and synecdoche. He (ibid) expands the conventional definition of metaphor and introduces grammatical metaphor as a new dimension of metaphoricity in human language(s). Metaphor is conventionally realized and viewed as 'use of words with some transferred meaning' (Halliday, 1985: 321). Correspondingly, it makes this clear that a lexeme if has a literal meaning, it can also have its metaphorical usage. Conferring Systemic Functional Linguistics (henceforth SFL), this 'transference of meaning' is taken as a 'view from below'. In that, we take the lexeme as a starting point and then something relative to the lexeme is said. However, this 'view from below' is one among three diverse perspectives of meaning-making and metaphoricity in SFL. This same view can be taken with a different perspective of 'above the clause' where lexemes are picked same for base and their relevant meanings are explored. Corresponding to this 'view from above' within SFL, a metaphor can be defined as 'a variant in the expression of meanings' (Halliday, 1985). Both the perspectives of metaphorical meanings are shown in the following Figure 1 to give a clear picture.
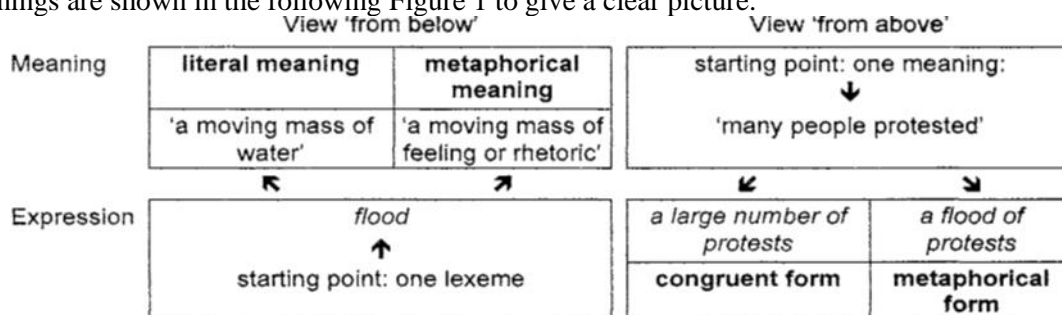

Figure 1: Two perspectives on metaphor (Halliday 1994/1985: 342)

Following the figure given above, it is apparent in 'view from above the clause' that lexical choice is not a lexical aspect only but it is lexicogrammatically, since why the metaphorical variation is lexicogrammatically selection. For this, varied expressions are put into comparison of single meaning. As is shown in the figure mentioned above, Halliday (1994) puts the example of the expression '*protests flooded in*' and its comparison with the expression given in '*protests came in large quantities/ protests received in large numbers or very many people protested*'. None of these expressions can be exemplified as pure lexical variant, however, distinction is seen in grammatical configuration in 'protests came in large quantities' with the additional prepositional phrase whereas 'the protesters as noun' is represented as verb- 'protested' in the sentence '*very many people protested*'. Hence, the rhetorical transference has grammatical element and if it is identified, it gives a base to grammatical metaphor (in that variations exist in forms only). This idea gives reasoning for and brings forward the concept of grammatical metaphor (Halliday, 1985: 320-342).

Let us pick the example (1) cited above again to further elaborate this process of transference. Example
(1) a. *They shredded the documents before they departed for the airport.*
     b. *Their shredding of the documents preceded their departure for the airport.*

The transformation from 'shredded' and 'departed' to 'shredding' and 'departure' is grammatical metaphor, pertinently ideational grammatical metaphor. According to Halliday and Matthiessen (2014), grammatical metaphor is derived with the help of atypical form-meaning mapping. Since, the concept of things, objects and participants in semantic terms are paired with noun phrases or nominal groups whereas the semantic notion of process and action is mapped to a verbal phrase typically. The atypical or marked form-meaning mapping in the above example (1b) involves nominalization wherein process are transformed into entities. This incongruent trascategorisation is referred to as experiential grammatical metaphor. The other instance of marked form-meaning mapping is found when temporal relation between independent and dependent clause is expressed with a conjunction 'before'. The transformation of clause complex into simple clause led by the transformation

of conjunction into verbal group 'preceded'. This transformation is called logical grammatical metaphor. As the present study focuses upon the use and distributional patterns of nominalization, therefore, the other transformation types will not be dealt later in the discussion.

Grammatical Metaphor and Lexical Metaphor

Grammatical metaphor has some affinity to the lexical metaphor as these both delineate something (=target domain) through referring something else (=source domain) (Halliday & Martin, 1993). However, the form-meaning mapping is in opposite direction for both the type of metaphors. Tellingly, one form in lexical metaphor is mapped to multiple meanings, on the other side, one meaning is expressed through multiple forms in grammatical metaphor (Taverniers, 2003). Simon-Vendenbergen (2003, p. 250) describes this such as:

"The dichotomy between GM and LM is artificial… The former involves the realization of meaning by means of a non-congruent grammatical category, the latter by means of a non-congruent lexical item…"

Nonetheless, the changes of one type essentially bring changes of another type. As it can be related to the configuration taking place in Figure 1 and its discussion. As in the case of lexical metaphor, the use of grammatical metaphor to its full extent requires a proper training and schooling.

Grammatical Metaphor and Academic Literacy

Halliday (1985b) identified grammatical metaphor as the central resource for abstraction and its contextual based usage also defines the level of language development in adult language system (Halliday, 1993a). The use of grammatical metaphor (henceforth GM) in academic writing is conditioned with writer's social, cultural and linguistic disposition which evolves gradually as the writer is engaged in knowledge specialist communities. Corresponding to learner's gradual development of different forms of knowledge specialization, GM also develops and this development quickens at secondary level of education (Derewianka, 2003). Unsurprisingly, this correspondence of familiarization with different forms of knowledge and felicitous use of GM does not go well when the learners as academic writers have gaps in their lexico-grammatical and semantic systems of English; because of this internal gap, ESL learners face various challenges in the appropriate use of GM (Byrnes, 2009; Schleppegrell, 2004b).

Nominalization in L2 Academic Writing

Keeping in view the key role of grammatical metaphor, specifically ideational grammatical metaphor, L2 academic writers focus on efficient use of this construction into their writing. The development of ideational grammatical metaphor at the later stages of L1 speakers/ writers predicts its difficulty level for L2 writers in getting acquired with its functionality and uses. There are studies indicating and highlighting the difficulties of L2 learners and an insufficient fluency of nominalization in L2 academic writing (He & yang, 2018; Liardet, 2016a, 2016b; Moon, 2014; Ryshina-Pankova, 2015; Yoon, 2018). On Thompson's (2010) line of thought, Nys' (2019) focus was on use of GM in high and low marked papers of L2 academic writers and the study found that highly scored papers gave preference to varied use of GM alongside a frequent use of it for cohesiveness in their papers.

Ortega (2012) brought to focus in research the functional variety of language, writing and grammatical metaphor. In the study of language complexity in L2 writing, Ortega (2012) re-evaluated 'a more is more complex' approach (p. 10) as reductionist approach. Two distinctive notions of dynamic and synoptic discourse (Halliday, 1985a; Halliday & Matthiessen, 1999) are taken into consideration by Ortega (2012) for a comprehensive understanding of L2 development in writing. The dynamic style of discourse is event-oriented and informal. It is oral hence more complex at syntactic level— grammatical intricacy. Whereas synoptic style is written and with higher degree of formality. It is entity-oriented with simple construction at syntactic level with low grammatical intricacy but with high lexical density. Conferring Halliday (1985a, p. 87), "The complexity of written language is the density of substance…By contrast, the complexity of spoken language is its intricacy of movement". Ortega (2012) demonstrates that nominalization, which she refers as GM in functionalist view, is central to the contextualized understanding of advanced SLA.

He and Yang (2018) focused on the distribution of experiential grammatical metaphor and logical grammatical metaphor in British National Corpus and research articles from varied disciplines of hard and soft sciences. Their results exhibit no correlation of discipline and technicality indicator i.e. nominalization. Neither, their study found any difference in deployment of nominalization by L1 and L2 users. The current study is also an attempt to further explore their point that among a variety of

linguistic resources, either it is nominalization which is responsible for disciplinary variation. Moreover, the seminal work in English for academic purposes (EAP) and L2 academic writing of Hyland (2005, 2006) and Biber and Colleagues (Biber & Gray, 2010, 2013; Biber, Gray & Poonpon, 2011) also informs the systemic functionalist insight of language development.

Data Analysis

The study was conducted using a corpus of problem-solution essays written by undergraduates of two major disciplines i.e. BS English and Engineering. It is important to note here that the participants of the study were selected after their language proficiency test. In accordance with Halliday's (1993a) point of view about GM development in advance stages, only the participants reaching higher than B1 CEFR level were recruited for the study. The writing prompt was given through an online form on Microsoft Teams and it was similar to both the study groups. The produced essays were later on checked for plagiarism and the essays with zero plagiarism were selected for the study. After all the said recruitment protocols, total one hundred essays were selected out of 412 essays in total. Focusing on the context of discipline, these essays were taken in parallel number from English and Engineering sub-corpora. Since, the study aim was not to compare the L2 writing skills upgraded by different institutions, the study data was collected irrespective of the parallel number of the institutes. Nevertheless, the majority in responses reach from National University of Modern Languages, University of Central Punjab, University of Engineering and Technology, The Islamia University of Bahawalpur.

Following manual annotation of all the features of nominalization as per GM typology given by Halliday (1998, p. 209-210) in the two sub-corpora, semi-automated analyses were done with the assistance of UAM CT. The tables present raw frequencies of the instances along with their relative frequencies. To note, raw frequencies are not given in percentages but relative frequencies are expressed as percentages. Furthermore, we want to reconnoiter if there are significant differences and variations in the occurrence of nominalization in the two sub-corpora, and if these analyses raise some differences then to what extent these frequency deviations occur due to chance. To cater this issue of significant variance, the chi-squared test (X^2 test) was selected as a statistical test to answer this question. This is a simple test for comparative statistical analyses that takes the observed and expected frequencies of the data analyzed into account denoting that if the variance is greater between the observed and expected values in data then it is less likely that the deviation is due to chance (Baker, Hardie & McEnery, 2006, p. 31).

RESULTS AND DISCUSSIONS

Firstly, we explored the study data to find out answer of first question stated above i.e. 'What is the occurrence pattern of nominalization in academic writing of Pakistani ESL learners?'. The results exhibit that students employed process nominalization more than any other pattern. In both the corpora, it took above 60% of the total occurrence patterns. The second mostly used pattern found in the analyses was 'entity-to-entity' pattern in pattern in English sub-corpus while in engineering sub-corpus it is quality-to-entity pattern which was second most employed pattern of nominalization. The least employed pattern in both the corpora was relator-to-entity pattern of nominalization. The Tables 1 and 2 given below display the frequency occurrence of each pattern of nominalization in BS English and Engineering sub-corpus respectively.

Table No. 1 Features data for Nominalization in BS English sub-corpus

Feature	Sub features	Frequency	Relative Frequency
nominalization	process-to-entity	1335	64.74%
	entity-to-entity	326	15.81%
	quality-to-entity	207	10.04%
	circumstance-to-entity	170	8.24%
	relator-to-entity	24	1.16%
Sum		2062	100.00%

Table No 2. Features data for Nominalization in BS Engineering sub-corpus

Feature	Sub features	Frequency	Relative Frequency
Nominalization	process-to-entity	1019	67.89%
	quality-to-entity	154	10.26%
	entity-to-entity	153	10.19%
	circumstance-to-entity	151	10.06%
	relator-to-entity	24	1.60%
	sum	1501	100.00%

Since, the predominant nominalization is process-to-entity across corpora, stated below are some illustrations with further interpretation of the incongruency employed through process nominalization in students' texts. Many process nominalizations have their cognate verbs but some of the incongruent forms are with homonym reconstruals and the realization of such incongruent form is totally dependent upon co-text intermediacy (Liardet, 2013). For instance,

1. The government should provide free laptops for this purpose and separate budget allocation for this learning system otherwise it is a complete failure.
2. But these benefits lose their relevance when faced with internet problems. All these benefits depend on the provision of an uninterrupted internet connection.
3. Many people were not in regular use of technology as it is a privilege to have access to it and many people were not having it.

The above examples are illustrations of the use of nominalized material processes in students' writing. The underlined structures in example 1 and 2 are the nominal groups and these nominal groups are headed by the process nominalizations which are given in bold. Picking up the nominal group "separate budget allocation" in example 1, the suggested mapping of its congruency can be "to allocate budget separately". In this way, the congruent realization of "allocation" maps unto its cognate verb "allocate". Similarly, the underlined structure of example 2 "an uninterrupted internet connection" is a nominal group headed by its process nominalization "connection" which is given in bold letters. The congruent realization of the structure can be "connect internet without interruption/ uninterruptedly" with the nominalization 'connection' mapping unto the cognate verb "connect". There is also an illustration of nominal group expansion in example 2, whereby process nominalization "provision" is preceded by its post-modifying nominal group as qualifier of an entity "provision". As earlier detailed process nominalizations can map unto their cognate verbs, this kind of process nominalization, such as provision, does not have its congruent precedent. Typically, the transcategorisation from entity to entity has this type of illustration. Given below is the table to represent the mostly occurred types of process nominalization in the study.

Table No. 3 The most frequent process nominalizations and their raw frequency

Material Process Nominalization	Congruent Realization	Raw Frequency
Learning	Learn	104
Connection	Connect	79
Solution	Solve	110
Assignment	Assign	44
Loss	Lose	25
Studies	Study	23
Participation	Participate	22
Connectivity	Connect	18
Distractions	Distract	42
Presentations	Present	22
Applications	Apply	13
Options	Opt	13
Use	Use	11
Change	Change	9
Submission	Submit	15
Cheating	Cheat	10
Instructor	Instruct	10

The results displayed in Tables 1 and 2 are aligned with the previous studies (Thompson, 2010; Ortega, 2012; Nys, 2019; Liardet, 2016b) showing that process nominalization is the most common feature of nominalization in Pakistani ESL writers' academic writing as well. After these results, our next focus of investigation was on the use of nominalization for information packaging in both the disciplines of humanities and science—English and Engineering. Table 4 given below represents an attempt to answer the second question i.e. "To what extent study discipline affects the use of nominalization pattern in Pakistani ESL learners' writing?".

Table No. 4 Comparative Statistics: Nominalization in BS English and Engineering

NOMINALIZATION	English		Engineering		Comparison			
	N	%	N	%	ChiSqu	P	Signif	Effect Size
- quality-to-entity	207	10.0	154	10.3	0.05	0.8291		0.007
- process-to-entity	1335	64.7	1019	67.9	3.83	0.0503	+	0.067
- circumstance-to-entity	170	8.2	151	10.1	3.49	0.0616	+	0.063
- relator-to-entity	24	1.2	24	1.6	1.24	0.2661		0.037
- entity-to-entity	326	15.8	153	10.2	23.55	0.0000	+++	0.168
TOTAL:	**2062**	**100.0%**	**1501**	**100.0%**				

The above table displays findings in raw frequency, relative percentage, χ^2 test value, its significance and effect size. As is represented in the table, quality-to-entity feature yielded 10.0% (N=207) in BS English sub-corpus against 10.3% (N=154) in BS Engineering sub-corpus. This frequency is somehow not as much as is reported in Nys's (2019) results wherein the students with lower marked papers employed it to the maximum frequency of 15.72%. The χ^2 value of the feature in the two sub-corpora is 0.05 (with p-value of 0.8291) that shows that there is no significant variation in its deployment by the students of English and Engineering. Following are the instances taken from the data to represent how this feature is instantiated by Pakistani ESL learners:

(a). *Firstly, the biggest issue I observed was the inability of teachers to use the technology.*
(b). *When there is room for flexibility, consistency no longer stays, especially when connections are weak.*

Like quality-to-entity feature, the relator-to-entity feature is also with no significance in deviation as its p-value is greater than 0.10 (χ^2=1.24). The frequency rate of this feature in the two sub-corpora is also not with great difference as BS English sub-corpus accounts for 1.2% (N=24) against somehow equal occurring rate of 1.6% (N=24) in BS Engineering sub-corpus. The results of this GM type resonate with Nys' (2019) findings wherein this type is reported to be in least substantial presentation in both the study groups. Nevertheless, the study context is also an important one factor. Nys's study (2019) focus was on high and low marked papers produced by ESL learners in the similar field of study. On the other hand, the present study has an altogether different context. Yet, it can be generally compared on the use of this GM type and its relevant frequency in both the studies. Following are the instances taken from the data to represent how this feature is instantiated by Pakistani ESL learners:

(a). *One cannot remove the factor of technology failing us at any moment.*
(b). *Another big reason for online class failure is the lack of supervision as students used to sleep or involve in different chores other than actively involving in class.*

Although, the process-to-entity feature yielded the highest occurrence rate with 64.7% (N=1335) in BS English sub-corpus against 67.9% (N=1019) in BS Engineering sub-corpus but the comparative statistics shows no greater deviation in the two sub-corpora exhibiting χ^2 of 3.83 with an effect size of 0.067 across corpora. The findings reveal weakly significant deviation in the two sub-corpora since its p-value is less than 0.10. This feature is instantiated such as:

(a). *The issue has been prevalent in this country for more than a decade and there seems to be no commendable improvement."*
(b). *You do not feel hesitation of seeking help from others.*

Similar is the case with circumstance-to-entity feature where significance level is little higher with χ^2 value of 3.49 at the level of p>0.05, hereby it is gaining its effect size of 0.063 across corpora. The relative percentage and raw frequency of this feature in BS English and Engineering corpora are 8.2% (N=170) and 10.1% (N=151) respectively. The deviation at the level of p>0.05 incurred by the above mentioned two features support Martin's (2007) viewpoint that students from diverse domains or fields construe ideational meanings purporting a related perspective on knowledge structure. In that, students of engineering substantiate the higher frequency rate in deployment of nominalizations from process and circumstance, further supporting the claim by Martin (2007) in his study wherein he maintained that the activity sequences in science texts give rise to technical terms naming the participants. Although, the task prompt given to both the study groups in study was similar, yet, it can be assumed that students of science and humanities maintain their disciplinary identities while exploiting the resources of meaning making of the language. Nonetheless, this study cannot overgeneralize this phenomenon of cross-disciplinarity and GM deployment, further cross-sectional and cross-disciplinary studies can be done to affirm this stance. Given below are some illustrations of this feature taken from the corpora:
(a*). Due to the dearth of interaction I used to get bore and used to node off sometimes.*
(b). *They manage their whole system in one room and possibly they got distracted by very small things in their surroundings.*

The results show substantial difference in the deployment of 'entity-to-entity' feature by students of sciences and humanities as Table.1 portrays that this feature occurrence is 15.8% (N=326) in BS English sub-corpus whereas its occurrence rate is only 10.2% (N=153) in BS Engineering sub-corpus. The p-value (p>0.01) declared in the result exposes the highly significant variance with χ^2 of 23.55 in the two sub-corpora. Correspondingly, the effect size 0.168 of this feature deployment across corpora is the largest among all other features deployed. Hence, it can be inferred through the results that students of humanities (English) use abstraction to construct knowledge while science students convert process-related information of technicalities into static disciplinary knowledge. This result corresponds with Wignell's (2007) stance that generic abstraction predominates in humanities. These results also correspond to Ravelli's (2004) findings that abstractions serve functions experientially and textually that are discipline specific. Again, an overgeneralization of the rule is not valid with the present small scale study with limited diversity of fields. Furthermore, Martin (2002) and Hood (2016a) also revealed the fact that we cannot ascertain that students of humanities do not use technicalities at all. Since the nature of study is descriptive analytic, the study constraints prevents us to look into the causes of the phenomena why the occurrence rate of nominalization types in the two sub-corpora has no/less/more significant deviation. Entity-to-entity type is an abstract form of already existed entity or it represents an ideational meaning of a phenomenal world around us. This feature deployment is illustrated in following instances picked from the two corpora.
(a). *But I cannot deny the fact that the discipline was disturbed, not only in study life but in general life as a whole.*
(b). *It is a natural phenomenon that every new invention has pros and cons and also there are various problems which a person faces when start a new thing to follow or observe.*

CONCLUSION
We explored the use of nominalization as an indicator of technicality to differentiate varied disciplinary practices in the construction of academic knowledge. A cross-sectional approach was adopted for this investigation of disciplinary variance in GM deployment. As is observed in the analysis and discussion section, at some levels the significance is shown in chi-square test value which indicates that not at every level but specific ones the use of nominalization creates a variance. These results confront He and Yang's (2018) observations that nominalization is not discipline sensitive. However, the analyses at delicate levels of the system of nominalization report that not every feature/ pattern of nominalization is responsible for this sensitivity in distinguishing texts of varied disciplines. Rather, the nominal groups reconstrual as qualifiers is the only significant pattern in nominalization process which can be held responsible for this distinction between the two disciplines. Although, the findings differ from He and

Yang's (2018) stance of nominalization as an unmarked pattern in disciplinarity variation. But, these also challenge the viewpoint "nominalization as a language of science", alike Gray's (2013) findings, the observed calculations and frequency of nominalization in the present study demonstrate that students of humanities group employed different patterns of nominalization more frequently than of science. The frequent use of nominalization by humanities group also disagrees with the study done by MacDonald (1994). Ostensibly, the major factor involved in such results can be that the students of engineering in Pakistan are equipped with no more vocabulary and they use similar linguistic resources repeatedly. Another, reason to believe can be that their study domain demands not much varied expressions like language students. This implies that there should be some language training programs for ESL learners when it comes to the construal of their domain specific knowledge. After the results, we also propose to focus on GM development of Pakistani ESL learners in their L2 instructions so that it enables them to fully exploit the meaning making global of language for proficient academic writing.

REFERENCES

Baker, P., Hardie, A., & McEnery, T., (2006). *A Glossary of Corpus Linguistics*. Edinburgh: Edinburgh University Press.

Banks, D. 2005. "On the Historical Origins of Nominalized Process in Scientific Text." *English for Specific Purposes. 24*, 347-57.

_____. (2003). "The evolution of grammatical metaphors in scientific writing", In A. M. Simon-Vandenbergen, M. Taverniers and L. Ravelli (Eds.), *Grammatical Metaphor: Views from Systemic Functional Linguistics*. Amsterdam and Philadelphia: John Benjamins, 127 – 148.

Baratta, A.M. (2010). Nominalization development across an undergraduate academic degree program. *Journal of Pragmatics, 42*, 1017-1036.

Biber, D. (2006). *University language: A corpus-based study of spoken and written registers.* Amsterdam: John Benjamins.

Biber, D., & Gray, B. (2010). Challenging stereotypes about academic writing: Complexity, elaboration, explicitness. *Journal of English for Academic Purposes 9*, 2-20.

_____. (2013). Nominalizing the verb phrase in academic science writing. In B. Aarts & G. Leech (Eds.), *The English verb phrase: corpus methodology and current change* (pp. 99-132). Cambridge: Cambridge University Press.

Biber, D., Gray, B. & Poonpon, K. (2011). Should we use characteristics of conversation to measure grammatical complexity in L2 writing development? *TESOL Quarterly, 45*, 5-35.

Biber, D., Johansson, S., Leech, G., Conrad, S., & Finnegan, E. (Eds.). (1999). *Longman Grammar of Spoken and Written English*. London: Longman.

Byrnes, H. (2009). Emergent L2 German writing ability in a curricular context: A longitudinal study of grammatical metaphor. *Linguistics and Education, 20*, 50–66.

Charles, M., (2003). A corpus-based study of the use of nouns to construct stance in theses from two contrasting disciplines. *Journal of English for Academic Purposes, 2*(4), 313-326.

Derewianka, B. (2003). Grammatical metaphor in the transition to adolescence. In A.M. Simon-Vandenbergen, M. Taverniers and L. Ravelli (Eds.), *Grammatical metaphor: Views from Systemic Functional Linguistics* (pp. 185–219). Amsterdam: Benjamins.

Devrim, D. (2015). *Teaching grammatical metaphor: Designing pedagogical interventions*. Newcastle upon Tyne, UK: Cambridge Scholars Publishing.

Flowerdew, J., (2006). "Use of signaling nouns in a learner corpus". *International Journal of Corpus Linguistics. 11*(3), 345-362.

Galve, I. G. 1998. "The Textual Interplay of Grammatical Metaphor on the Nominalizations Occurring in Written Medical English." *Journal of Pragmatics 30*:363-85.

Gray, B. (2013). "More than Discipline: Uncovering Multi-dimensional Patterns of Variation". *Academic Research Articles Corpora. 8*, 153-81.

Halliday, M. A. K., (1978). *Language as social semiotic: The social interpretation of language and meaning*. Edward Arnold, London.

_____. (1999/2004). "The Grammatical Construction of Scientific Knowledge: The Framing of the English Clause", In M.A.K. Halliday, *The Language of Science (Volume 5 in the Collected Works of M.A.K. Halliday*. Edited by J. J. Webster). London and New York: Continuum, 102 – 134.

_____. (1985). An Introduction to Functional Grammar. First Edition. London: Arnold.

Halliday, M.A.K. & Matthiessen, C.M.I.M. (1999). *Construing experience through meaning: A language-based approach to cognition*. London: Continuum.

_____. (2004). *An introduction to Functional Grammar (3rd edition)*. London: Edward Arnold.

Halliday, M.A.K., & Martin, J. R. (1993). *Writing Science: Literacy and Discursive Power*. London: The Palmer Press.

Halliday, M.A.K. (1985a). *Spoken and Written Language*. London: Oxford University Press.

_____. (1985b). *Introduction to Functional Grammar*. London: Arnold.

_____. (1993a). Towards a language-based theory of learning. *Linguistics and Education, 5*, 93-116.

_____. (1994). *An Introduction to Functional Grammar* (2nd edition). London: Edward Arnold.

_____. (1998). Things and relations: Regrammaticising experience as technical knowledge. In J.R. Martin & R. Veel (Eds.), *Reading science: Critical and functional perspectives on discourses of sciences* (pp. 185-235). London: Routledge.

He, Q., Yang, B., 2018. A corpus-based study of the correlation between text technicality and ideational metaphor in English. *Lingua Elsevier. 203*, 51--65.

Hood, S. (2016a). Ethnographies on the move, stories on the rise: Methods in the humanities. In K. Maton, S. Hood, & S. Shay (Eds.), *Knowledge building: Educational studies in Legitimation code theory* (pp. 117-137). London: Routledge.

Hyland, K. (2005). *Metadiscourse: Exploring Interaction in Writing*. London: Continuum.

_____. (2006). *English for Academic Purposes*. New York: Routledge.

Jiang, F., (2015). "Nominal stance construction in L1 and L2 students' writing". *Journal of English for Academic Purposes, 20*, 90-102.

Liardet, C. L. (2016a). "Grammatical Metaphor: Distinguishing Success." *Journal of English for Academic Purposes 22*, 109-18.

_____. (2016b). "Nominalization and Grammatical Metaphor: Elaborating the Theory." *English for Specific Purposes 44,* 16-29.

_____. (2016). Grammatical metaphor: Distinguishing success. *Journal of English for Academic Purposes, 22*, 109-118

MacDonald, S. P. (1994). *Professional Academic Writing in the Humanities and Social Sciences.* Carbondale: Southern Illinois University Press.

Martin, J. R. (1985/1989). *Factual writing: Exploring and challenging social reality*. Geelong, Vic: Deakin University Press.

Martin, J. R. (1993). Life as a noun: Arresting the universe in science and humanities. In M. A. K. Halliday, & J. R. Martin (Eds.), *Writing science, literary and discourse power* (pp. 241-293). London: Palmer Press.

_____. (2002). Writing history: Construing time and value in discourses of the past. In M. Schleppegrell, & M. C. Colombi, (Eds.), *Developing advanced literacy in first and second languages: Meaning with power* (pp. 87-118). Mahwah, NJ: Lawrence Erlbaum Associates.

_____. (1992). English Text: System and Structure. Amsterdam: John Benjamins.

_____. (2007). "Construing knowledge: A functional linguistic perspective". Language, Knowledge and Pedagogy. *London Continuum,* 34-64.

Moon, Y. 2014. "An Exploration of Grammatical Metaphor in Korean EFL Writers' Texts." *Foreign Language Education 21*, 51-72.

Nys, M. (2019). *Grammatical Metaphor in Non-Native English Academic Writing: A Comparison of higher-marked and lower-marked papers written by non-native university students*. M.S. diss., Dept. English, University, Ghent, Belgium.

O'Donnell, M., (2008). "The UAM Corpus Tool: Software for corpus annotation and exploration". In Callejas, C. M. B., et al. (Eds.), *Applied Linguistics Now: Understanding Language and Mind.* (pp. 1433-1447). Universidad de Almeria, Almeria,

Ortega, L. (2012). Interlanguage complexity: A construct in search of theoretical renewal. In B. Szmrecsanyi & B. Kortmann (Eds.), *Linguistic complexity in interlanguage varieties*, L2 varieties, and contact languages. Berlin: Walter de Gruyter.

Ravelli, L. J., (2004). Signalling the organization of written texts: Hyper-Themes in management and history essays. In L.J. Ravelli & R.A. Ellis (Eds.), *Analysing academic writing: Contextualised frameworks* (pp.104-130). London: Continuum.

Ryshina-Pankova, M. 2015. "A Meaning-based Approach to the Study of Complexity in L2 Writing: The Case of Grammatical Metaphor." *Journal of Second Language Writing 29*:51-63.

Schleppegrell, M. J. (2004b). Technical writing in a second language: The role of grammatical metaphor. In L.J. Ravelli, & R. A. Ellis, (Eds.), *Analysing Academic Writing: Contextualised Frameworks*. (pp.172-189). London: Continuum.

Simon-Vandenbergen, A. M. (2003). Lexical metaphor and interpersonal meaning. In A.M. Simon-Vandenbergen, M. Taverniers, & L. J. Ravelli, (Eds.), *Grammatical metaphor: Views from Systemic Functional Linguistics* (pp. 223–256). Amsterdam: Benjamins.

Taverniers, A. M. (2003). Grammatical metaphor in SFL: A historiography of the introduction and initial study of the concept. In A. M. Simon-Vandenbergen, , M. Taverniers, & L. J. Ravelli., (Eds.), *Grammatical metaphor: Views from systemic functional linguistics* (pp. 5–33). Philadelphia/ Amsterdam: John Benjamins.

Thompson, G. (2010). Grammatical Metaphor and Success in Academic Writing. In S. Hunston & D. Oakey (Eds.), *Introducing Applied Linguistics: Concepts and Skills* (pp. 24–34). London/New York, NY: Routledge.

Wignell, P., (2007). On the discourse of social science. Darwin, NT: Charles Darwin University Press.

Yoon, C., (2018). "Nominalization in Korean EFL Learners' Argumentative Writing: A Comparative Study of Distribution and Use". *The New Studies of English Language and Literature. 69*, 249-74.