Linguistic Analysis of Cohesive Devices in Engineering Students' Argumentative Essays

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Abstract: This study linguistically analyzed the argumentative essays of engineering students for the school year 2022-2023. Specifically, it determined grammatical and lexical devices used and the overall cohesion in their written essays. A Convergent-Parallel research design was used in the study. The study considered the 168 second-year engineering students officially enrolled in Purposive Communication for first-semester S.Y. 2022-2023. Halliday and Hasan's (1976) taxonomy was used to describe and analyze the occurrence of the use of grammatical devices along reference, conjunction, substitution, and ellipsis, as well as lexical devices along collocation and reiteration (repetition, synonym, and superordinate). Findings show that all types of cohesive devices are present in the students' essays. Grammatical devices displayed that reference and conjunction are the most prevalent cohesive ties, while ellipsis and substitution are less recurrent. Lexical devices, on the other, revealed that repetition and collocation are the most prevalent cohesive devices, while superordinate and synonym are less recurrent. Further, the overall cohesion of the students' essays revealed that they are poor at constructing cohesive text, specifically in organizing their ideas logically.

Keywords- Argumentative Essay; Coherence; Cohesion; Cohesive devices

1. INTRODUCTION

Successful writing is mainly determined by the amount of practice students have had with the language's forms and patterns. Forcing a student to express himself using structures he does not understand would only result in frustration and a lot of work on the teacher's part.

When students write compositions as a course requirement, they need to establish clear relations between one sentence and the next by connecting those statements. Good compositions establish a sense of direction by making explicit connections among their different parts, so what is said in one sentence or paragraph not only sets up what is to come but is informed by what has already been said. Connections can be done by using transition terms, adding pointing words, using key terms and phrases, and repeating words but with a difference [1].

However, it has been observed that college students despite having English subjects and maximum exposure to the English language have difficulty in organizing their thoughts coherently, this indicates that students get confused in identifying one idea from the other [13].

Further, they do not have enough competence in producing linguistically well-formed written material to create meaningful texts that convey the information appropriately and accurately as well as coherently [2].

As such, it is emphasized that students should be exposed to more meaningful activities or drills to appreciate and eventually master their use [3].

2. RELATED LITERATURE

The choice of cohesive devices as a linguistic analysis is a tool to investigate certain types of texts that can be made for a variety of reasons. Firstly, it is cohesive devices that make a text [4] and therefore can be used as a tool to determine whether a sequence of sentences can or cannot be described as a text [5]. Put differently, cohesive devices have the potent effect of maintaining text unity, thus creating the distinction between texts as unified wholes and disconnected sequences of sentences [6]. Secondly, through cohesive devices, writers establish the logical organization and structure of information in all kinds of texts [7]. Thirdly, cohesive devices are the only non-structural component of texts and therefore constitute the sole instrument for non-structural, textual analysis [8]. Finally, cohesive devices are a fundamental linguistic tool that producers of texts use to help receivers decode, interpret, or understand their messages [9].

Reference, substitution, ellipsis, conjunction, and lexicalities are the five sorts of cohesive devices identified by Halliday and Hasan (1976). According to them, grammatical Cohesion is divided into main subtypes: reference, ellipsis, substitution, and conjunctions, and give distinctive definitions to the different types of grammatical cohesion. Reference refers to the situation in which one element cannot be semantically interpreted unless it is referred to another in the text, (personal pronouns, possessive adjectives, possessive pronouns, demonstratives, and articles are the parts under reference). Substitution occurs when an item is replaced by another word in the text to avoid repetition (nominal, verbal, and clausal are the three types of substitution). Ellipsis is used to substitute by zero, and it could be (nominal, verbal, or clausal). In conjunction as a cohesive device, it focuses on the

attention not on the semantic relation as such, as realized throughout the grammar of the language, but on one particular aspect of them, namely the function they have of relating other linguistic elements that occur, but are not related by other, structural means.

Furthermore, conjunctions as a cohesive device are composed of additive, adversative, causal, and temporal.

3. STATEMENT OF THE PROBLEM

The study linguistically analyzed the argumentative essays of engineering students for the school year 2022-2023

Specifically, it sought to answer the following questions:

1. What grammatical devices are identified in the argumentative essays of engineering?
2. What lexical devices are identified in the argumentative essays of engineering students?
3. What is the overall cohesion of the student's essays?

4. METHODOLOGY

4.1 Research Methodology

The present study made use of a Convergent-Parallel research design. It involves the simultaneous collection of qualitative and quantitative data in the argumentative essays of second-year engineering students who are officially enrolled in the subject Purposive Communication for first-semester S.Y. 2022-2023 with a total number of 280 students.

4.2 Locale of the Study

The study was conducted at the College of Engineering, Cagayan State University-Carig Campus.

4.3 Respondents and Sampling Procedure

Stratified random sampling was used to divide the population into smaller subgroups, or strata, based on shared characteristics of the members and randomly selected using simple random sampling to ensure fairness of representation on each group.

4.4 Data Analysis

After the collection of data, the texts were typed and numbered using the Arabic numerals 1, 2, 3, etc. for identification purposes. Each essay was analyzed manually to determine the occurrences of the different types of cohesive devices using Halliday and Hasan's Theory.

Frequency counts and percentages were used in identifying the occurrences of the cohesive ties in the essays of the students. In computing the overall cohesive ties used, the weighted mean was used.

5. RESULTS AND DISCUSSION

Occurrence of Grammatical Cohesive Ties in the Argumentative Essays

Table 1 shows the occurrences of grammatical devices as to their type. It can be gleaned from the table that out of the four types of grammatical cohesion, reference has the highest frequency of 3,184 or 56.58% percent. This is followed by the use of conjunction with a frequency of 2,315 or 41.14% percent. Ellipsis occurred only 72 or 1.28% while 56 or 1.00% instances of substitution were identified.

Although all types of grammatical cohesion have been identified, the results imply that the student's essays are not well-organized or hold a unified discourse primarily in the use of conjunctions.

This finding, in terms of dominant grammatical ties used, is identical to Lavadia's [10] findings where reference was the most predominantly used grammatical tie, followed by a conjunction, ellipsis, with no evidence of substitution.

Table 1: Occurrence of grammatical cohesive devices in the argumentative essays of second-year Engineering students.

Cohesive Devices	Total Use	
	No.	%
Reference	3184	56.58%
Conjunction	2315	41.14%
Substitution	56	1.00%
Ellipsis	72	1.28%
Total	5627	100%

The majority of these referential items are personal references and the definite article *the*. These referring items are typically endophoric (the item in question can be recovered within the text) particularly anaphoric (referring back or referring to a preceding text) in nature.

The following extracts illustrate the referential used in the students' essays:

Extract 1:

There are many *farmers* suffering because the buyers buy *their* products beyond *their* expenses to produce *their* products. And they also suffer to transport their products.

Extract 2:

I would share the experience of my *neighbor*. *He* worked as an electrician sometimes *he* go home late. *He* needs to finish *his* work before *he* go home because some of his clients are far from our municipality.

In extract 1, the antecedent "farmers" refers to the words "they" and "their" which are considered personal references, the same with extract 2 the words " he" and "his" are all personal references. This implies that students have background knowledge of the use of personal references since parts of the texts are held together by these personal references, and readers do not have to guess what or to whom the referents are referring.

The following extracts illustrate the non-referential "it" used in the students' essays:

Extract 3:

It is better to have an expensive project that is strong and could last in a very long time than have a cheaper project that will get broken after a year or two.

Extract 4:

They always bring up these concerns to the officials but *it* seems like they always bring up these concerns to the officials but it seems like they don't pay attention to these people.

It has to be noted that there are other reference items in the text that are non-referential other than the illustrated case. Some personal pronouns found in academic texts are exophoric or situational (refers to linguistic expressions that are used to refer to situational elements that are non-verbal and excluded from the text but not from the context; their absence may affect the deeper comprehension of the reader because some elements are not found in the written text [11] and hence not cohesive.

Extract 5:

As a solution, *we* must given them an educational assistance or scholarship for poor family that excelle their children in academics.

Extract 6:

Even *we* want to evacuate in other barangay, *we* don't have a boat to use. Throwing garbages at the river and they didn't think that *we* are affected and the one who affected by flood because *we* area in low-lying area only. I think *we* should stop this one.

Exophoric reference is not included as part of cohesion. It nonetheless contributes to the overall coherence of a text, the personals referring to the speaker (I, me, my mine) and the listener (you, your, yours) as well as the speaker together with the listener (we, us our, ours) have their referents in the context of the situation, hence, non-cohesive, but they can become cohesive in quoted speech.

Definite Article 'the'

The following extracts illustrate the definite article "the" used in students' essays:

Extract 7:

Camalaniugan is one of *the* most outstanding Municipality here in the Province of Cagayan.

Extract 8:

They were destroying *the* coast of Aparri as well the river and the water is now gradually growing up every year.

The use of referential "the" in students' essays is coherent, not only because the referent is recoverable, but also because they are culture or context-bound. As a result, it makes it easier to comprehend the text at hand.

Demonstratives

The following extracts illustrate the Demonstrative used in the students' essays*:*

Extract 9:

To solve the first problem, our mayor should give commands and allocate some funds for the project "Light the Way " for the implementation of street lights not only to the way heading to barrio but also to every road that is part of Alcala. Furthermore, our town mayor should start *"IS'PORT PROJECT".*

This project will entail both academic and sport supports to the youth and children of Alcala.

Extract 10:

Solana is one of the most successful municipalities in Cagayan. It is very rich in terms of agriculture farming which is the main source of income here in Solana, specifically rice and corn crops. People living in *this* municipality are called Solanians comes from the word Solana.

The above extracts present the different demonstrative references used by students. In extracts 9-10, the word "this" is anaphorically referred to the words "IS'PORT PROJECT" and "Solana".

Under investigation, the majority of identified instances of demonstrative references behave anaphorically.

Locative Adverb "there"

The following extracts illustrate the Locative Adverb "there" used in the students' essays:

Extract 11:

Solana is a wide municipality that consists of 38 barangays. You can smell the fresh air in any part of Solana, air pollution cannot last because of our lively nature which helps to prevent the place from air pollution. Farming is the number one livelihood of almost all the people living *there*.

The word *"there"* functions in a way termed as deictically its meaning is understood within the context in which it occurs [12]. In such cases, the locative adverb is cohesive and it calls to a location (overseas) relative to the speaker. The cohesiveness is because the location is retrievable or specific in the text.

Conjunctions

The following extracts illustrate the Additive Conjunction used in students' essays:

Extract 12:

As a Aparriano, I can really say that the town is full of malevolence, *and* the government official turns into hellion.

The examples above further show the conjunctions seem to have text-organizing function, breaking the discourse into chunks and indicating that the writer is continuing with a topic, expounding it, or shifting to a new one.

Based on the extracts above, additive conjunction indicates the use of coordinating conjunction "and" gives more information about the writer's town.

Ellipsis

The following extracts illustrate the Ellipsis used in the students' essays:

Extract 13:

This poverty leads to every students have low quality of education if never that this scholarship program take an action by our locality this may help big time in every students education instead of stopping their education many students can be inspired to continue what they are taking they will have the courage to achieve what they are dreaming because even their own locality leader support them despite of the poverty they are facing there is this (scholarship)to support achieving their dream.

The words "scholarship, is a nouns or phrases that are elided or omitted called Nominal Ellipsis.

In these extracts, the writer shortened the text by employing ellipsis, and in the process, avoided unnecessary repetitions.

Occurrence of Lexical Cohesive Devices in the Argumentative Essays

Table 2 presents the occurrences of lexical cohesive devices as to their types. Out of 4363 identified lexical devices in the student's essays, Repetition has the highest frequency at 3652 or 83. 70% percent followed by Collocation with a frequency of 584 or 13.79 % percent. Superordinate and Synonyms are the least frequently used lexical ties with frequencies of 88 (2.02%) and 39 (0.89%), respectively.

Table 2: Occurrence of lexical cohesive devices in the argumentative essays.

Total	Lexical Cohesive Devices	Total Use	
		No.	%
4363	Repetition	3652	83.70%
	Collocation	584	13.39%
	Synonyms	39	0.89%
	Superordinate	88	2.02%

The following extracts illustrate the repetition used in the students' essays.

Text 1:

The home of Ibanags. The heart of Cagayan. The first city in the province. The hottest paradise of the north. The hottest City in the Philippines. A place where you can find home and nicest people. This is *Tuguegarao City* from the smiling Land of Beauty, Cagayan Province.

Tuguegarao City is widely known for Ibanag people. Consisting of almost 50 barangays divided by different areas namely, the eastern, the western area, the central (the centro) and the north. *Tuguegarao City* is headed by a Lady Mayor.

As a student, I witness different local problem in our community and in the city. One major problem we faced is delayed action of our Local Government Unit before, during, and after natural calamities, second traffic lights,third , agricultural Sectors, and lastly Education and Scholarship.

LGU Action – natural calamities are one of the problems here in *Tuguegarao City*. We suffer floods, landslides, and even strong typhoons. As a government unit, they must always ready to help in times of need. We must work together in unity to overcome this issue in our community. Traffic – traffic is the main problems of tricycle drivers, jeepney drivers, and especially commuters. *Traffic lights* are very useful but they have only few *traffic lights* in the city. To solve this, we must create more traffic lights, wider the road and put more lights to avoid accident. Agricultural Sector – *Tuguegarao City* is rich in agricultural livelihood especially corn and rice farming. But during calamities, farmers faces their worst enemy when their root crops are damage. Farming is the only source of income here in the city. We should put an action on our farmers because most of them are below poverty line. They must give agricultural benefits. Agriculture is the backbone of economy.

Education – education is the most important weapon to change the world. Almost million of dreams vanish everyday because of lack of education. As a solution, we must given them an educational assistance or scholarship for poor family that excelled their children in academics. We must give opportunities in our young individuals in chasing their dreams.

In the written essay above (text 1), it shows that the words *Tuguegarao City*, *traffic lights* and education were repeated several times considering that the topic is about problems in their municipalities.

Superordinate

Defined as a general word and the specific is called a hyponym. This indicates that the respondents are not fond of using it in their writing.

The following extracts illustrate the Superordinate used in the students' essays.

Extract 14:

Enrile is my *municipality* located at the bottom of the *Cagayan Valley* province bordering Isabela. It is mainly

an agricultural municipality which crops include rice, corn, and peanuts. There are many problems in our municipality which I hope will be fixed in the future.(EE2C-E4)

In the paragraph above the word "Cagayan" is the general term of place, while "Enrile" is the specific place.

Synonyms

Lastly, the use of synonyms, which had been the most rarely used in the essays indicates that the students are poor at grasping synonymous words.

The following extract illustrates the Synonyms used in the students' essays

Text 2

From my own *experience* on 20th year of existence, I encountered different problems in our municipality and none of them have been solve. Our mayor has the highest position and had the power to *fix* all of it with his powerful words and works. But it seems like its just all words but lack of works. I know that we shouldn't the one who lead the mayor, but we must be the one who follow him.With all due respect, I will only write this based on my *observation* and doesn't aim to downgrade our honourable mayor. Frist thing is that, he should improve the roadrails and highways of our municipality through *repairing* the damage ones. He must or should be strict in giving orders especially about illegal logging, and illegal mining. Our mayor should take all problems seriously, in order to keep the cleanliness and orderliness of his municipality. He should also take some research and advance knowledge about the wrongdoings of every official in every barangay. It was because in our barangay respectively, I encountered some corrupt officials. And mostly these corrupt officials are the one who had the highest position in our barangay and they are also the one who leads in illegal gambling and illegal logging. They are giving and putting stains into the best image of our barangay, they're destroying our natural resources just for their own advantage, to gain more money. Our beloved mayor shall create a team or an organization to stop these wrong doings, for the own good of his fellowmen. He should also look more about the improper election, because vote-buying is a vast kind of deadly disease that keeps our barangay worsen. This kind of behaviour is our decadely complains but none of it were answered. He must also stop *protecting* and *hiding* all illegal related violators, and he should consider them as a threat in our town. Hope all of these can be seen as good suggestions for our mayor to improve our town.

As gleaned from the text above, the words *experience and observation, fix and repairing, protecting and hiding* are synonymous with each other. This indicates that students are not fond of using synonyms.

Collocation

The use of Collocation, which is considered a type of lexical cohesive ties, indicates the co-meaning together and location meaning place the words that collocate go together.

The following extracts illustrate the Collocation used in the students' essays

Extract 15:

In lower barrios in Penablanca like Manga, Lapi and Bauan, the major problem is the lack of *network coverage* in which it was a challenge for the people specially students in those places. In order for them to communicate or have an access in *internet* they still need to climb on the higher mountains. In the longest years, it wasn't yet solved by the previous mayors. As a youth in our hometown, I suggest that our mayor should focus on this problem and solve it by accessing the places and build on produce *cell sites* on those barkids.

In the extract above, the words "communicate, access the internet, and cell sites" all refer to network coverage.

Table 3: Reliability results from three inter-raters

Cronbach's Alpha	Cronbach's Alpha Based on Standardized items	N of Items
0.823	0.819	15

	Mean	Variance
Item Means	1.755	0.011
Item Variances	0.253	0.002
Inter-Item Correlations	0.232	0.024

As can be seen from the table, the reliability of the three raters in the assessment calculated on Cronbach's Alpha reliability was 80, which was highly acceptable. This means that three different raters were highly consistent in scoring and rating the organization of the students' essays.

On the other hand, the mean score of essays is 1.75 which indicates that the writing performance of the students in terms of using cohesive devices is poor. Essays with 4 points or below were regarded as poor. Essays with greater or less than 8 but not more than 9 were regarded as good, and essays with 11-15 points were excellent.

As such, it was found that students' essays were lack of appropriate use of grammatical cohesive devices and lack of logical organization of ideas. It was a notable observation from inter-raters that students tend to include one or more cohesive devices incorrectly such as conjunction. Further, ideas do not follow one another logically as they tend to

introduce another idea that are not related to the previous presented.

To address this problem, the researcher provides a lesson exemplar that can help gauge the students to improve their writing skills by using cohesive devices.

6. CONCLUSION AND RECOMMENDATIONS

Conclusion

All students' essays exhibited general tendencies toward the use of all cohesive devices. However, limited vocabularies and multiple instances of incorrectly used cohesive devices affect the logical organization of their ideas.

As such, it is therefore concluded that the students will have a better understanding of the use of these devices if they will have adequate materials to be used for them to easily comprehend the correct use of cohesive devices specifically grammatical devices.

Recommendations

Given the findings and conclusion of the study, it is recommended that:

1. Teaching cohesive devices may be detailed, with a model paragraph for each type, showing clearly how sentences cling to each other with their use.

2. English language professors may provide more writing-related activities to train students how to write effectively and eventually give immediate feedback for them to improve their crafts.

3. The College of Engineering and Architecture may conduct a writing assessment for the freshmen to determine what aspect of writing the students need to improve and strengthen.

4. The suggested exemplar may be adapted to improve the writing skills of the students using cohesive devices.

5. Future researchers can replicate the study by considering other programs.

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