
RESEARCH ARTICLE

Ideational Meanings in Results and Discussion Section of English Students' Final Project Reports Viewed from SF-MDA

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ABSTRACT

The purpose of this study is to investigate how knowledge is construed by integrating multimodal texts in English Students' Final Project Reports, especially in the results and discussion section. Therefore, the qualitative data were obtained from the results and discussion section of English Students' Final Project Reports published in 2022, Politeknik Negeri Bandung. In analyzing the data, Systemic Functional-Multimodality Discourse Analysis (SF-MDA) was employed. The SFL framework was used in investigating verbal texts that were supported by visual texts. The visual texts were studied by applying MDA. Both frameworks were applied to find out the intersemiosis relation of verbal and visual modes. The results show that the students used tables and graphs to support their claims in the verbal texts. However, the intersemiosis of the modes is divergent. It is implied that the students were not aware yet of the function of the visual mode in their final project reports. This study can be a reference to improve students' academic writing.

KEYWORDS

Multimodal texts, English students' final project reports, SF-MDA, intersemiosis

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1. Introduction

This paper discusses the ideational meanings of multimodal texts used by English students in their academic writings. As stated by Halliday & Matthiessen (2014), ideational meanings serve to represent the content or the knowledge carried out by a text. The content of the knowledge is realized by the process types in the TRANSITIVITY system. Scientific texts, for example, are commonly characterized by relational processes (Martin, 1992; Khorina et al., 2022; Khorina, 2018). The relational clauses with relational process realize the knowledge of taxonomy, either hyponymy or meronymy relation, function, properties, or structure of an entity. However, scientific texts do not only consist of verbal texts to construe knowledge. They also employ visual modes, such as table or figure. The function of visual modes is to support the verbal texts since the visual texts. Like verbal texts, visual texts also have ideational meanings, which serve as representational structures (Kress & Van Leeuwen, 2020). The structure has two categories: narrative and conceptual. But the conceptual may be divided into classification, analytical, and symbolic. The integration of multimodal texts will make the texts comprehensible (Engbretsen & Kennedy, 2020) since the visual texts will support the statement or information represented by the visual texts. In other words, both types of texts should work together to construe the knowledge they are representing. This study raised an issue of how English students employed multimodal texts in constructing their knowledge in their academic writing, especially in the results and discussion section of their final project reports.

The study of multimodal texts may be approached using various theories. According to (Jewitt et al., 2016), multimodal texts may be explored by using Systemic Functional-Multimodal Discourse Analysis (SF-MDA), Social Semiotic, or Conversational Analysis. Among the three approaches, this study was conducted by using SF-MDA. The previous studies related to SF-MDA have been found in many papers. They focused on advertisement (Enli, 2014), language acquisition (Liu, 2022), magazine (Gao, 2017), and

tweets (Wignell et al., 2021), to mention a few. In academic discourse, the frameworks have been intensively used to investigate cohesion found in international postgraduate business students' multimodal written texts (Alyousef & Alnasser, 2015), thematic progression in Saudi Postgraduate Business Students' multimodal texts (Alyousef & Alsharif, 2019), theme and information structure (Alyousef, 2020a), the Textual and the Logical Cohesive Devices in a Postgraduate Accounting Course (Alyousef, 2020b), and experiential meaning in Saudi Postgraduate Business Students' multimodal accounting texts (Alyousef & Alsharif, 2017). Although there are also papers dealing with ideational meanings of multimodal texts (O'Halloran, 2008; Rafelina & Hermawan, 2022), they are not concerned with English students' final project reports yet.

Studying the English students' final project reports will have some benefits. The results will show how English students construct their knowledge using multimodal texts. They will also see how far students can integrate their knowledge using multimodal devices. The results can be used as a reference to develop the student's academic writing using multimodal texts.

2. Literature Review

Ideational meanings: Clause as representation

Ideational meaning represents experiences or knowledge through clauses as representation. The clause works on a TRANSITIVITY system, which involves participant, process, and circumstance. The six types of processes in the system serve various meanings of experiences (Halliday & Matthiessen, 2014). Each type of process realized by a verbal group will employ different participants.

The first type of process is known as the material process, which relates one's experience with the material world or physical world. This process is subdivided into the material process of doing and happening, both of which may occur in either a transformative clause or a creative one (Halliday & Matthiessen, 2014). The material process of doing is commonly realized by transitive verbs, while the material process of happening is realized by intransitive verbs. Whereas transformational clauses refer to material clauses which represent the results of an entity transformation. This type of clause tends to occur in mechanical engineering texts (Khorina, 2020), implying that mechanical engineers tend to make new items by doing transformation instead of creating or innovating new ones. But, creative clauses describe that the process results in creating a new entity. The clauses below exemplify them.

- 1) *Rocks **formed**.* (creative clause with process of happening)
- 2) *The pressure **formed** rocks.* (creative clause with process of doing)
- 3) *The rocks **broke** (into small pieces).* (transformative clause with process of happening)
- 4) *The pressure **broke** the rocks (into small pieces).* (transformative clause with process of doing)

In clause 1), subject serves as the Goal realized by nominal group *Rocks*, the entity which is created. Thus, the process is a material process of happening. Whereas in 2), the subject represents the Actor realized by a nominal group. *The pressure* which creates the Goal realized by the nominal group *rocks* the new entity. Whereas in 3), the subject acts as the Goal, the entity which is transformed. But the clause has a material process of happening realized by an intransitive verb. In 4), the clauses represent a transformation of the entity in which the Actor serves as the participant, which transforms the entity.

Unlike the material process, the mental process relates an experience with a conscious or unconscious world. This process, like material one, operates on two subdivisions: please type and like one. However, mental processes may occur in four types of clauses, as exemplified by (Halliday & Matthiessen, 2014).

- 5) *He **saw** the car.* (perceptive clause)
- 6) *He **knows** the car.* (cognitive clause)
- 7) *He **wants** the car.* (desiderative clause)
- 8) *He **likes** the car.* (emotive clause)

Clause 5) belongs to the perceptive clause. The mental process realized by the lexical verb **saw** indicates perception. The subject, as the Sensor, is the participant who has the experience of perception. In clause 6), the process manifests the experience of cognition realized by the lexical verb **knows**. The desiderative clause is represented by clause 7). The mental process realized by the lexical verb **wants** expresses the experience of desire. Clause 8) represents an emotive clause which has a mental process realized by the lexical verb **likes**. It can be seen that different lexical verbs realizing mental processes will determine different mental experiences, resulting in diverse mental clauses.

Relating one fragment of experience with another one is represented by a relational process. This process is used to characterize and to identify, which suggests that it has two subdivisions of a process known as attributive and identifying (Halliday & Matthiessen, 2014). Relational process is a kind of process which characterizes scientific genres (Martin, 1992). The process may

appear in one of three types of relational clauses: intensive, possessive, or circumstantial. The clauses, especially intensive and possessive ones, represent taxonomy, which is a characteristic of scientific knowledge. They may have a function as definition, classification, composition, properties (Halliday & Martin, 2004), and function (Martin et al., 1997), while circumstantial clauses may serve as structures in mechanical engineering texts (Khorina et al., 2022). The clauses below are some examples of relational clauses that have specific roles in scientific texts.

- 9) *Precipitation* **refers to** all forms of water which fall (*precipitate*) from the sky.
- 10) *Physical geography* **is** a science.
- 11) Every ecosystem **has** 2 parts: the physical environment and the biome.
- 12) They all **have** a membrane.
- 13) The function of a grinder **is** to smooth the surface of material.
- 14) The workpiece **is supported** on a table.

Clause 9) represents definition. The term being defined is represented by a Token realized by nominal group *Precipitation*. The elaboration represented by the Value realized by the nominal group *all forms of water which fall (precipitate) from the sky*. Clause 10) represents classification, X is a kind of relation. Carrier is the participant representing the entity being classified, which is realized by nominal group *Physical geography*. The entity assigned as classification is represented by an Attribute realized by the nominal group *a science*. Clause 10) represents composition. Carrier is the participant representing the entity being composed, which is realized by the nominal group *Every ecosystem*. The entity being assigned as composition is represented by Attribute realized by nominal group *2 parts: the physical environment and the biome*. The relation between these two participants is that X is a part of Clause 12) represents properties or features. Carrier is the participant representing the entity being characterized as realized by nominal group *They*. The entity of properties is represented by the Attribute realized by the nominal group, *a membrane*. Clause 13) represents a function. The carrier is the participant who owns the function realized by the nominal group, *The function of a grinder*. Whereas the entity being assigned as a function is represented by an Attribute realized by the adverbial group *to smooth the surface of material*. Clause 14) represents structure. The participants represent the entity of having structure is Carrier realized by the nominal group *The workpiece*. Attribute is the participant, which represents the structure realized by the adverbial group *on a table*.

The behavioural process is a type of participant in the TRANSITIVITY system. As the term suggests, the clause having this process represents experience through behaviour, either physiological or psychological (Halliday & Matthiessen, 2014). The clauses of this process type are identified by the lexical verb, which manifested behaviour, such as *breathing, coughing, smiling, dreaming and staring*.

- 15) *She is smiling*.
- 16) *He's always grumbling*.

Clauses 15) and 16) show the process of behaviour. Behavior is the participant representing the entity who has the experience of behaviour and is realized by nominal groups *She*. The behaviour is represented by the process realized by a nominal group *is smiling*. Like in 15), clause 16) represents the clause having a behavioural process. Behavior is the participant representing the entity who owns the behaviour. This participant is realized by the nominal group *He*. The behaviour is realized by verbal group 's *always grumbling*.

The verbal process is also a type of process in the TRANSITIVITY system. This process is also known as the process of saying. It is realized by verbal groups containing lexical verbs *say, tell, congratulate, persuade, explain, etc.* (Halliday & Matthiessen, 2014). Some examples from (Martin et al., 1997) show this verbal clause.

- 17) *They replied*.
- 18) *They told me*.
- 19) *They told a story*.

Clause 17) only has one participant, that is Sayer, realized by verbal group *They*. Clause 18) has two participants: Sayer and Receiver. Sayer is the participant who has the experience of saying realized by nominal group *They* while Receiver is the participant who is receiving of the process of saying realized by nominal group *me*. In clause 19), there are also two participants involved. However, the second participant is not called Receiver but instead Verbiage. The participant is realized by the nominal group *a story* which serves as the content of what is being told.

The last type of process is known as the existential process. This process represents that something exists or happens (Halliday & Matthiessen, 2014). Existential clauses have only one participant, that is Existent as shown in the clauses below.

20) *There was a surprise.*

21) *There was a big storm last night.*

Ideational meaning: Representational structure

The visual mode also represents ideational meanings like the verbal mode. Unlike verbal mode, ideational meaning in visual mode has a representational structure. The representational structure is subdivided into narrative and conceptual structures. The conceptual structure can be divided into classification, analytical, and symbolic structures, as shown in Figure 1.

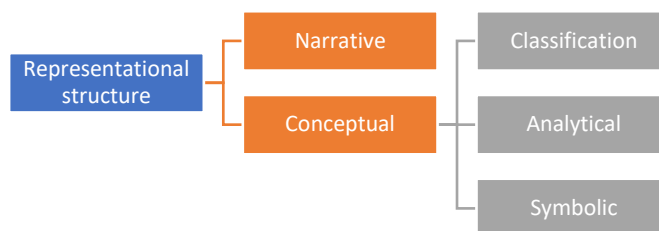


Figure 1. Representational structure of visual mode

3. Methodology

This study employed a qualitative method with descriptive analysis. The data were obtained from the Results and Discussion Section of English Students' Final Project Reports published in 2022. There are 18 Final Project Reports published in 2022 found in 2022. There were two types of data selected from the sources: visual data in the form of tables and figures or graphs and verbal texts, which are supported by the visual texts. Tables are used to present the exact data (Durbin Jr, 2004; Kastlelec & Leoni, 2007; Vessey & Galletta, 1991), while graphs are suggested to show trends (Gelman et al., 2002; Kastlelec & Leoni, 2007).

The analysis took several steps. First, identifying visual modes/texts which were used in the Results and Discussion section. Then, the verbal texts used to support the visual ones were identified. Next, the verbal texts were analyzed by using Halliday's approach of ideational to find out the function of the clauses represented. After that, the visual texts were analyzed by applying the MDA framework proposed by (Kress & Van Leeuwen, 2020) to find out the conceptual structures they carried out. Later, intersemiosis analysis was applied to find out the integration of the multimodal texts (see Table 1.). Finally, the conclusion was drawn. The steps are illustrated in Figure 2.

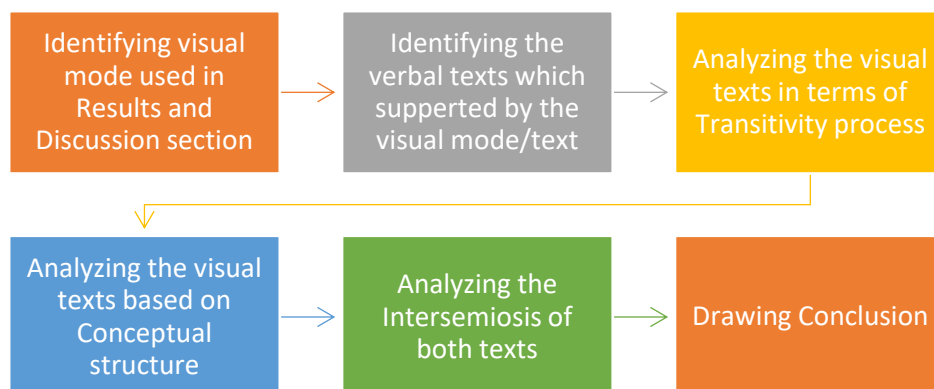


Figure 2. The steps of analysis of the data

In analyzing the intersemiosis of verbal and visual modes, the table below is used.

Verbal Mode	Intersemiosis	Visual Mode
Participants – Process – Circumstance	Experiential meanings Logical semantic relation	Represented Participant-Process- Circumstance

4. Results and Discussion

Figure 1. shows that there are two types of visual modes found in the Results and Discussion section. They are tables and figures. The number of the table used is almost three times that figure. The function of the visual modes is to support the verbal texts that accompany them. In other words, the visual and verbal texts should be integrated. Intersemiosis can be viewed from the ideational meanings of both types of texts, which will be presented below. These results imply that the students tend to use exact data more frequently than to employ graphs to show their results.

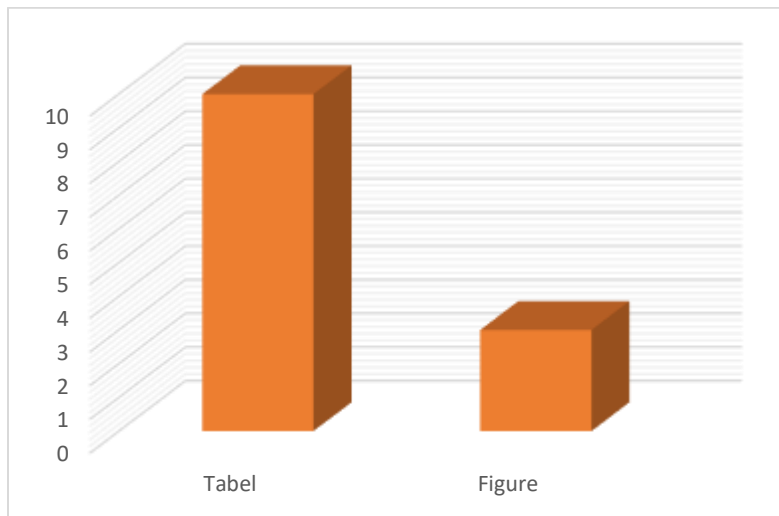


Figure 1. Types of visual text used by the students

Text 1

Verbal text	Visual text																																																	
Based on the table above, it is concluded that there are 72 times of lexical cohesion occurrences in the 5 articles of The Guardian Post. The occurrences of adverbs types seen from the highest to the lowest one is as follows: time is 29 times (40%); place is 23 times (23%); degree is 8 times (11%), frequency is 2 times (3%), and manner is 10 times (10%).	<p><i>Table 3 result of analysis</i></p> <table border="1"> <thead> <tr> <th>Article Number</th> <th>Tm</th> <th>Pl</th> <th>Dg</th> <th>Fr</th> <th>Mn</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>A.1</td> <td>10</td> <td>3</td> <td>2</td> <td>0</td> <td>2</td> <td>17</td> </tr> <tr> <td>A.2</td> <td>6</td> <td>1</td> <td>3</td> <td>1</td> <td>0</td> <td>11</td> </tr> <tr> <td>A.3</td> <td>4</td> <td>4</td> <td>1</td> <td>0</td> <td>4</td> <td>13</td> </tr> <tr> <td>A.4</td> <td>4</td> <td>7</td> <td>1</td> <td>1</td> <td>1</td> <td>14</td> </tr> <tr> <td>A.5</td> <td>5</td> <td>8</td> <td>1</td> <td>0</td> <td>3</td> <td>17</td> </tr> <tr> <td>Total</td> <td>29 (40%)</td> <td>23 (32%)</td> <td>8 (11%)</td> <td>2 (3%)</td> <td>10 (14%)</td> <td>72 (100%)</td> </tr> </tbody> </table>	Article Number	Tm	Pl	Dg	Fr	Mn	Total	A.1	10	3	2	0	2	17	A.2	6	1	3	1	0	11	A.3	4	4	1	0	4	13	A.4	4	7	1	1	1	14	A.5	5	8	1	0	3	17	Total	29 (40%)	23 (32%)	8 (11%)	2 (3%)	10 (14%)	72 (100%)
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Total	29 (40%)	23 (32%)	8 (11%)	2 (3%)	10 (14%)	72 (100%)																																												

The clauses in Text 1 can be decomposed as follows.

1. Based on the table above, it is **concluded** (mental process)
2. that **there are** 72 times of lexical cohesion occu
3. rrences in the 5 articles of The Guardian Post (existential process)
4. The occurrences of adverbs types **seen** from the highest to the lowest one (behavioural process)
5. **is** as follows: (relational process)

6. *time is 29 times (40%); (relational process)*
7. *place is 23 times (23%) (relational process)*
8. *degree is 8 times (11%) (relational process)*
9. *frequency is 2 times (3%) (relational process)*
10. *and manner is 10 times (10%). (relational process)*

The types of processes of the clauses are mental, existential, behavioural, and relational. The dominant process is relational, which is one of the characteristics of scientific texts (Martin, 1992). Whereas visual text has the representational structure of conceptual taxonomy represented by table.

Table 1. The intersemiosis of verbal mode and visual mode of Text 1

Verbal Mode	Intersemiosis	Visual Mode
<p>Texts 1 consists of nines clauses.</p> <p>The primary participants are <i>lexical cohesion occurences, adverbs types, time, place, degree, frequency, manner.</i></p> <p>The text has mental, existential, behavioral, and relational processes.</p> <p>It also has Circumstantial elements of place and, frequency and percentage.</p>	<p>Verbal text uses Participants as transitivity elements realized by nominal groups <i>lexical cohesion occurences, adverbs types, time, place, degree, frequency, manner.</i></p> <p>Visual text uses primary Represented Participant realized by Article Number and Tm, Pl, Dg, Fr, Mn.</p> <p>Verbal text uses Circumstantial elements of place and frequency, and percentage, while visual text uses Circumstantial elements of frequency realized by number and percentage.</p> <p>In terms of logical semantic relation, Verbal and Visual text are divergent shown by: Verbal text has more primary participants: <i>lexical cohesion occurences, adverbs types.</i> Visual text has primary Represented Participant: <i>Article Number and Tm, Pl, Dg, Fr, Mn.</i></p> <p>Verbal text has Circumstantial elements of place and frequency and percentage, while visual text has Circumstantial elements of frequency realized by number and percentage.</p>	<p>The visual text has as primary Represented Participant realized by Article Number and Tm, Pl, Dg, Fr, Mn.</p> <p>It uses relational process represented by lines.</p> <p>It uses Circumstantial elements of frequency realized by number and percentage.</p>

Based on the table of analysis above, it can be concluded that the integration of verbal and visual texts is divergent. Some of the primary participants used in the verbal text are not related to the ones in the visual text. Also, there is a circumstantial element used in the verbal text that is not represented in visual text.

Text 2

Verbal text	Visual text								
<p>The chart above shows that literal idiom is the most frequent type found in the books, with a total of 24 idioms (46.15%) out of 52 idioms. In the second place, there is a semi-idiom with a total of 14 idioms (26.92%); this type is as frequent as the pure idiom with a total of 14 idioms (26.92%).</p>	<table border="1"> <caption>Data from Figure 2: Types of Idioms</caption> <thead> <tr> <th>Type of Idiom</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>Pure idiom</td> <td>14</td> </tr> <tr> <td>Semi idiom</td> <td>14</td> </tr> <tr> <td>Literal idiom</td> <td>24</td> </tr> </tbody> </table>	Type of Idiom	Frequency	Pure idiom	14	Semi idiom	14	Literal idiom	24
Type of Idiom	Frequency								
Pure idiom	14								
Semi idiom	14								
Literal idiom	24								

Text 2 can be decomposed into five clauses, as listed below.

- 1) The chart above **shows** (relational process)
- 2) that literal idiom **is** the most frequent type (relational process)
- 3) **found** in the books with a total of 24 idioms (46.15%) out of 52 idioms. (behavioural process)
- 4) In the second place, **there is** a semi-idiom with a total of 14 idioms (26.92%) (existential process)
- 5) this type **is** as frequent as the pure idiom, with a total of 14 idioms (26.92%). (relational process)

The types of processes the clauses possess are existential, behavioural, and relational. The dominant process is relational, which is one of the characteristics of scientific texts (Martin, 1992). Whereas visual text has a representational structure of conceptual taxonomy represented by a graph.

Table 2. The intersemiosis of verbal mode and visual mode of Text 2

Verbal Mode	Intersemiosis	Visual Mode
<p>Texts 2 consists of five clauses.</p> <p>The primary participants are <i>The chart, literal idiom, a semi-idiom</i></p> <p>It also has Circumstantial elements of place, frequency and percentage.</p>	<p>Verbal text uses Participants as transitivity elements realized by nominal groups. <i>The chart literal idiom, a semi-idiom.</i></p> <p>Visual text uses primary Represented Participant realized by Types of Idioms, Pure idiom, Semi idiom, Literal idiom.</p> <p>Verbal text uses Circumstantial elements of place and, frequency, and percentage, while visual text uses Circumstantial elements of frequency realized by number.</p> <p>In terms of logical semantic relation, Verbal and Visual text are divergent shown by: Verbal text has different primary participants: <i>The chart, literal idiom, a semi-idiom.</i></p> <p>Visual text has primary Represented Participant: <i>Types of Idioms, Pure idiom, Semi idiom, Literal idiom.</i></p> <p>Verbal text has Circumstantial elements of place, frequency and percentage, while visual text has Circumstantial elements of frequency realized by number.</p>	<p>The visual text has as primary Represented Participant realized by Types of Idioms, Pure idiom, Semi idiom, Literal idiom.</p> <p>It uses relational process represented by blue bars.</p> <p>It uses Circumstantial elements of frequency realized by number.</p>

Referring to the intersemiosis analysis of verbal and visual text above, it can be concluded that they are divergent. It is indicated by the use of primary participants and circumstantial elements.

5. Conclusion

This study reveals that in constructing their knowledge, the English students used tables and graphs as two kinds of visual modes in their final project reports. The table and graphs served as data to support their claims. However, based on the analysis using SF-MDA, the students used both modes divergently. This can be seen from the differences which occur in the number of primary participants and circumstantial elements. These findings may be used as a reference to develop English students' academic writing, especially in elaborating visual data in the Results and Discussion section. This section is crucial since it strongly shows the knowledge of the students.

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