

# Synergistic Meaning-Making in Multimodal Science Texts: A Pedagogical Framework for Visual-Verbal Literacy

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**Abstract:** Multimodality in education takes on an extended perspective on literacy to incorporate the scope of multimodal communicative practices in which youngsters are engaged in the present digital age. With the development of advanced technology, more and more semiotic resources are showing up in different texts, and English texts are getting increasingly multimodal due to the concurrent usage of devices from multiple semiotic communication modalities. Employing multimodal analysis, the author analyzes the scientific article “Every Cloud Tells a Story” from the following parts: genre, field and experiential meanings, tenor and interpersonal meaning, mode and textual meanings, and multimodality in the classroom. The analysis shows that visual thinking is vital in understanding the text’s meaning and helps learners understand how multimodal discourse uses semiotic resources to produce meaning. Language aspects, such as organization, cohesiveness, grammatical features, verb types, vocabulary choices, and layout, should also be assigned significant priority in the classroom to assist students in understanding how multimodal texts employ many semiotic resources to construct meanings.

**Keywords:** Multimodal; Genre; Multimodal Literacy

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## Introduction

Recently, studying English teaching classes from a multimodal perspective has attracted a growing emphasis (Li, 2023). Multimodality aims to understand how semiotic resources (visual, gestural, spatial, linguistic, Etc.) function and are organized (Lim et al., 2022). System functional linguistics (Halliday & Matthiessen, 2014) and social semiotics (Kress & Van Leeuwen, 2020) form the theoretical foundation of multimodal discourse analysis. Researchers primarily look at how multimodal teaching models affect the acquisition of language abilities despite theoretical investigation of foreign language teaching design from a multimodal perspective (Li, 2023). Writing is the one with the most significant research (Shin et al., 2020), more and more semiotic resources appear in various texts. Texts written in English are also becoming more and more multimodal: devices from various semiotic modes of communication are used synchronously (Goodman, 1996). A significant number of “letters,” “advertisements” and even “government circulars” in most countries at the least use several visual information forms other than verbal language (i.e., a lot of photos, charts, and various fonts are contained in newspapers and graphic devices (logos or borders) are usually contained in company letterheads) (Goodman, 1996).

Similarly, Knox (2008) points out that meaning is produced both “linguistically” and “multimodally” in “interviews,” “resumes,” and even “letters of application,” and language teachers have combined the theory with their teaching practice for a long time. Multimodal Analysis bears the potential to “conceptualize pedagogical approaches” and should offer a basis for research into “how learners interact with multimodal material in the classroom” (Royce, 2002). Therefore, this essay explores aspects to help learners comprehend how multimodal texts use different semiotic resources to make meanings based on the Analysis of an example text (Appendix A).

## 1 Multimodal Analysis

The two-page scientific article “Every Cloud Tells a Story” contains various semiotic resources: language, images, coordinates, arrows, and layout. The whole text is positioned on a blue background, which looks like the sky and in which different clouds are crowded. The text seems to be targeted at primary or secondary school students, who are expected to learn about some knowledge concerning science and natural phenomena (different types of clouds).

## 2 Genre

The text is divided into four blocks on the two pages. The first block can be regarded as the main text visually due to its bigger font than any other block on the page (except the title) and its positioning just below the main text heading (Every cloud tells a story) and the summary title (types of clouds) in the background of a yellow arc with a green light halo which looks like the sun. In addition, the block is positioned at the top left of the first page and is integrated with the main image (other text blocks are minor and separate from each other).

The main text can be identified as a part of an Information Report - a General Statement about clouds from language features. The general statement describes the variable shapes of the cloud at the beginning, with a related process in the use of verbs: look. Visually, the verbal text is planned to complement the image on a blue background that looks like the sky with different clouds.

The top left verbal text on the right page of the spread can be viewed as a separate text by space, which also bears a separate heading (Three levels of clouds). The block can be identified as another part of the General Statement because it generally introduces various clouds with different levels. Therefore, the text is connected with the main text verbally. However, they are separate texts visually, which may be planned to make space for the images concerning layers of clouds below that are divided by the coordinates.

The verbal texts at both the left and right bottom of the page (different kinds of clouds) can be indicated as the other part of the information report - a description of various clouds mentioned in the general statement (Three levels of clouds). Although the verbal texts describe the various clouds respectively and separately, they serve as the description part of the entire text. In addition, the description’s

relatively strong framing (with space, coordinates, arrows, and pictures of various clouds) differentiates it from the general statement part on the entire page. The verbal passages in this part are consistent with the visual description in the images, which shows different kinds of clouds mentioned in the verbal text (cirrus, cirrostratus, cirrocumulus, altostratus, altocumulus, stratus, nimbostratus, stratocumulus, cumulus, and cumulonimbus clouds). All the cloud images are planned in three layers according to their height utilizing the coordinates, and each of them is positioned near its separate text, which describes the appearance and characteristics of the relevant cloud and is connected with its separate image by an arrow. Thus, the layout of the verbal texts works together with the semiotic resources and the staging of the genre to make meaning.

The short verbal text titled “A roller coaster in a cloud” in the middle of the right page can be viewed as an embedded anecdote in the description part, which is visually isolated (with an explicit border, green and yellow background, and a sign of cumulonimbus cloud in a circle above) from the other texts on the two-page spread and is located in the picture of the cumulonimbus cloud. That may be designed to attract the readers’ interest and attention to the topic and offer another entry to the text.

To sum up, although the four verbal blocks are visually separate, they all contribute to the common social purpose of the two-page text, which is to provide general information about the levels of cloud and description involving how they are distinguished. Just as the statement of Gerot & Wignell (1994) and Gerot (1995), the function and purpose of an Information Report is to “describe the way things are” and to “organize information about social, synthetic, or natural phenomena.” In this two-page spread, the verbal texts work together with the semiotic resources (images, arrows, coordinates, and layout) to obtain the above objective.

### 3 Field and experiential meanings

The verbal text talks about different levels and types of clouds that belong to basic science, which is also shown using images that consist of different clouds, arrows, and coordinates on the page. The main image describes different kinds of clouds in terms of their levels in the sky, which can be identified as a conceptual image (types of clouds). By the image, the levels and types of clouds are also classified according to their height in the verbal text with the use of a lot of nominal groups to build information about the clouds and adjectives (thin, delicate, fine, white, transparent white, heavier grayer, thick dark, pretty, white, dark, and scary-looking) to add description. Meanwhile, technical nouns (cirrus, cirrostratus, cirrocumulus, altostratus, altocumulus, stratus, nimbostratus, stratocumulus, cumulus, and cumulonimbus clouds) and present tense relating process (are) are also used to identify and classify the clouds in the verbal text.

The separate cloud images can be regarded as a series of narrative images that depict different kinds of clouds and show the levels of clouds and their spatial relation. Following the images, present tense relational processes “are,” “look,” “have” and behavioral processes “form,” “make,” “cover,” “allow,” “follow,” “last,” “grow” are also used to describe their appearance in the verbal text. In addition, circumstances of place (in the sky, around the sky, cover the sky, covers the sky and completely hides the Sun) are used to describe the position of the clouds and manner (bringing rain or snow, bringing precipitation that will last one or two hours) is used to describe the relationship between the clouds and weather in the verbal text.

In brief, the visual images on the two-page spread work together with the step-by-step sequential depiction in the verbal text to achieve experiential meanings. Although they are positioned in the background of the sky, which looks realistic, the use of the coordinates and arrows shows that they are scientific.

### 4 Tenor and interpersonal meaning

Visually, it is evident that the distance in the main image is social or medium and that power is not a leading variable because there is no human participant in it. It looks like a picture of the landscape. However, the readers’ perspective is horizontal, making them accessible and able to distinguish the three levels. In addition, the images of the clouds are objective, which helps the readers (in particular, young readers) understand the clouds concerning their position (height). In agreement with the visual images, all Finite clauses in the verbal text are declarative statements for giving information. On the other hand, the third person pronominals (this, that, they, their), whose referent is cloud or clouds, show that it is an objective reporting.

Visually, the modality is relatively high in the two-page spread. Although the image is not an actual photo, the description is relatively realistic, and the cloud images with the coordinates resemble scientific reality. Linguistically, the text is a factual and engaging report concerning different types of clouds, consistent with the aims of the images.

In conclusion, both the visual images and the verbal text on the page contribute to describing the text as a reporting with equal, objective, factual content. In addition, the images construct a similar interpersonal relationship between the topic and the reader through perspective and modality.

### 5 Mode and textual meanings

From the two-page spread, it is evident that there is no strong framing between the main text and the main image because there is no border around the text, which looks like a part of the image. In contrast, the other passages are relatively clearly framed using smaller fonts and space as separate texts from the main image. Similarly, information is organized in subheadings and lexical item chains associated with clouds and reflects the information bundles in the verbal text.

Visually, the secondary text (A roller coaster in a cloud) has relatively strong framing, employing black borders and background with different colors, which separate it from other blocks. Verbally, it is an embedded anecdote in the description part, distinguishing it from other verbal passages. On the other hand, the framed text is positioned on the image of the cumulonimbus cloud, which shows the harmony in composition and concerns the verbal text block with the cloud image.

Visually, there is no single salient point on the two-page spread, which may be favorable for readers to scan the entire text to find out parts they are interested in (i.e., the short embedded anecdote in the description part). Verbally, there is no pronominal reference from language to the images. Nevertheless, arrows that connect the verbal texts with their relevant images serve as the reference.

In summary, information organized in the verbal text works with other semiotic resources to achieve the textual meaning. The secondary text is located on the cumulonimbus cloud image to associate the verbal text with the cloud image, and arrows concern the verbal text with their relevant images.

## 6 Multimodality in the classroom

According to Knox (2008), visual characteristics of texts (i.e., font size, font formatting, paragraphing, figures, and tables) need to be paid attention to in terms of some reading skills (skimming and scanning). Texts need to be comprehended as “making meaning visually as well as linguistically” to practice these reading skills. Similarly, Unsworth (2001, cited in Knox, 2008) also suggests that learners ought to grasp “how the resources of language, image, and digital rhetorics can be deployed independently and interactively” (namely, developing “linguistic,” “visual” and “digital meaning-making knowledge”) to construct a variety of meanings to participate in “emerging multiliteracies effectively.”

From the multimodal Analysis above, we see that semiotic resources other than language play an essential role in understanding the meaning of the text. Like Royce’s (2002) statement, questions regarding the “ideational aspects of a visual” are the most abundant source of information. Therefore, the following questions should be considered in the classroom to ask students to predict and understand how the various semiotic resources work together to make meaning: What does the visual present; to whom is it presented; how is it presented; what type of text is it; who wrote it; whom is it written for; what is it written about; who are the ideal readers; how might it be improved; how does it decide the effect of the text on readers (Royce, 2002; Butt et al, 2000). According to the Multimodal Analysis, these questions will help the learners understand that the text is written for secondary school students, introduce some knowledge about a variety of clouds, and then describe different types of clouds in terms of their height as the images exhibit. Also, the answers to these questions will “produce descriptive glosses, referred to as the image’s visual message elements (VMEs)” (Royce, 2002).

Another part of the text that needs to be considered in class to help learners grasp how multimodal texts use different semiotic resources to make meaning is language features. According to Royce (2002), lexicogrammar encodes sketches in meaning or semantic content. Lexical choices of the author help find out “how the visual ideational choices relate semantically to the verbal (written) ideational choices” (Royce, 2002). Similarly, Butt et al. (2000) also propose strategically drawing learners’ attention to language features in a text to explore its “structure,” “texture,” “lexicogrammatical features,” and “features of expressions.”

Therefore, the following linguistic features should also be considered in the class to help the learners: organization of the text (stages and function of each stage), the cohesion of the text (pronoun reference, words concerning clouds), grammatical features (declarative statements, types of verbs (action, being and having verbs), present tense, theme, circumstances), vocabulary choices (everyday words, technical words (names of clouds), descriptive words, neutral expressions), the layout (an essential clue to the meaning of the text) (Butt et al, 2000).

## 7 Conclusion

In conclusion, although the verbal texts are visually separate, they work with other semiotic resources to achieve the two-page spread’s social purpose, experiential, interpersonal, and textual meanings. In addition, all the semiotic resources contribute to describing an equal, objective, factual scientific information report.

From the multimodal Analysis, it can be concluded that the ideation of a visual plays a vital role in catching the meaning of a text. On the other hand, language features, including organization, cohesion, grammatical features, verb types, vocabulary choices, and layout, should also be attached to importance in the classroom to help learners comprehend how multimodal texts use different semiotic resources to make meanings.

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#### Appendix A

