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The Metalanguage of "Visual Design" into the Classroom for the Construction of Intermodal Meanings

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Abstract

Given that little research has been conducted to date in the classroom about the exploitation of aspects of "visual grammar" for the teaching of literacy, the purpose of this study is to provide research data to support the adoption of a common image/text relations metalanguage in educational practice as an effective tool for critically negotiating, and mainly, for composing intermodal meanings. Forty-six sixth-grade students who attend a state primary school in the city of Ptolemaida, northern Greece participated in the study. The materials used in the study consisted of: (a) informational, print-based multimodal texts and, (b) compositions produced by students, at first individually and then in groups. The overall research is designed on a pre-test phase, an instructional intervention phase, and a post-test phase. The qualitative comparative analysis of student compositions manifests that the metalanguage of "visual design" constitutes a truly promising, pedagogically utilizable tool for the description, interpretation and comprehension of the interactions among the various semiotic modes co-existing in multimodal ensembles. This entails the development of multimodal and visual literacy skills by the primary education students. These findings highlight the need for adoption and incorporation of such a metalanguage for the design of curricula facilitating the teaching of literacy, in order to reframe the monomodal nature of communication.

Keywords: metalanguage, visual grammar, social semiotic theory, semiotic functional linguistics, multimodality, school context/s, intersemiosis, intermodal synergies

1. Introduction

On the threshold of the 21st century, where the image has become an integral part of human culture, we are faced with the necessity for subjecting all means of making meaning under a single and coherent theoretical framework. Another reason for this need lies in the fact that the communicational and, by extension, the semiotic landscape has changed dramatically in the last 25 years, and continues to change, in the light of a wide range of intertwined social, economic, cultural and technological developments (Kress, 2010).

"Globalization", or more accurately "internationalization", which according to Kress (2010) refers not only to the transportation of financial capital, but to conditions which make it possible for features of a milieu to be present and active in another, whether economic, cultural or technological, has as a result, over perhaps the last three decades, a transition from a relative stability to an often rapid variability of social life which involves changes in the domain of meaning: in representation and in "semiotic" production, in dissemination and digital distribution of media messages, in mediation and communication (Kress, 2010).

The semiotic consequences are recognizable in many domains and at many levels. For example, (a) at the level of media and the dissemination of messages by transitioning from the book and the page to the screen, (b) at the level of semiotic production by transitioning from the older printing technologies to digital and electronic media, and (c) at the level of representation by transitioning from the dominance of the mode of writing to the mode of image (Kress, 2010). The results of these changes are noteworthy, not only at the theoretical level, but even more in the practices of everyday life. That is why the academic interest now focuses on the features of this new communicational world, the world of imagery and multimodality (Kress, 2010).

Given, however, that the existing theoretical approaches to communication are grounded on the language, which has ceased to constitute the unique means of making meaning, do not allow us to understand and explain the recently emerging communicational landscape, but only a part of this. As a result, a *theory of semiosis* is needed which will be able to describe and explain the different intermodal interactions for meaning-making. Such a theory provides the social

semiotic account of representation and communication.

1.1 Social Semiotic Theory of Multimodality

Social semiotic theory is concerned with meaning in all its forms, which is realized within social environments in the context of social interactions. The social semiotic account of meaning requires that socially located, and culturally and historically shaped individuals, by using the socially made and culturally available resources, become active creators of meaning.

The theoretical formulation of social semiotics reflects aspects arising from the Systemic Functional Linguistics of Halliday and his collaborators (Halliday, 1973; 1978, Halliday & Hasan, 1976, 1985; Halliday & Matthiessen, 2004; Martin, 1992; Martin & Rose, 2003) based on the following assumptions:

- signs are always newly made,
- signs are motivated, and not arbitrary relations of meaning and form,
- the motivated relations of meaning and form are based on and derive from the interest of the sign-maker,
- the forms (signifiers) used for sign-making are shaped within social interaction and become part of the semiotic resources of the culture (Kress, 2010: 54).

In other words, according to Systemic Functional Linguistics the structures of language have evolved, and continue to evolve in connection with the functions of making meaning they serve within the social system or the culture where they are utilized (Unsworth, 2008[a]).

The consideration of language as one of the many and different interrelated semiotic systems, and, therefore, the assumption that the forms of all semiotic systems associated with the functions of making meaning they serve within social contexts, demonstrates the possibility for Systemic Functional Linguistics to contribute to the development of a multimodal and intersemiotic theory. More specifically, SFL suggests that the functions of making meaning of all semiotic codes may be grouped into three main categories or metafunctions, that is, the representational, interpersonal and textual metafunctions. These specific metafunctions are associated with the three corresponding situational variables which operate in all contexts, namely field, tenor, and mode. The field refers to the social activity, its content or its topic. The tenor refers to the nature of the relationship between all those involved in a communicational situation, while the mode is related to the medium, the channel of communication (Unsworth, 2008[a], 2008[b]).

In recent decades it has become obvious to many education researchers that the increasingly multimodal nature of the texts of our Information Age has made it necessary to reconceptualise the nature of literacy and pedagogy of literacy (Kamil, Intrator & Kim, 2000; Leu, 2006; Leu, Kinzer, Coiro & Cammack, 2004; Russel, 2000) taking into consideration the integrative role of language and other modalities in contemporary texts. Kress (2000: 337) characteristically argues that "*It is now impossible to make sense of texts, even of their linguistic parts alone, without having a clear idea of what these other features might be contributing to the meaning of a text*."

The complex synthesis of systems of making meaning requires students to be able to investigate intermodal relations – *intersemiosis* – focusing on examining the ways in which image and language work both individually and in conjunction with one another in order to construct meaning in multimodal ensembles (Kress, 1997, 2003; Lemke, 1998a, 1998b, 2002; Macken-Horarik, 2003a, 2003b, 2004; Martin, 2002; O'Halloran, 1999, 2003a, 2003b; Royce, 1998, 2007). For this purpose, students and educators need to possess a metalanguage, so that they can talk about the ways in which the affordances of verbal and visual code, as well as more generally of other semiotic modalities, are used to make meaning and offer interpretations.

1.2 The Metalanguage of "Visual Design"

Although several types of metalanguage related to the description of verbal, visual and intermodal relations between different processes of making meaning are already developed and widely applied (Halliday, 1994; O'Toole, 1994; Lemke, 1998[a]), the "grammar of visual design" of Kress and van Leeuwen (1996, 2006) constitutes one of the most systematic tools for the analysis of structural elements and intra/intersemiotic semantic relationships between different modalities intertwined for constructing meanings in specific social and cultural contexts. The "grammar of visual design", which is grounded on the social semiotic theories of SFL, assumes that the visual structures, similarly to linguistic ones, perform simultaneously three metafunctions. The *representational*, which answers the question of how people, objects or events are depicted. With respect to the representational metafunction, participants in a visual structure are represented as involved in actions or reactions, accordingly they may be either the actors or the subjects of action/reaction of someone else, either in terms of a kind of relation, part-whole structure or as to what is meant by a participant. The *interpersonal*, which answers the question of how the depicted is related to the viewer. In this case, three dimensions are involved: the *social distance* between the viewer and the depicted, the *social relation* which is denoted by the angle (horizontal or vertical) from which the viewer sees the portrayed, and the *social interaction* which relates to whether the represented participants looking at the viewers, form a symbolic demand or do not address them visually, but they are offered to them as a kind of information. It is worth noting that in all three cases the relationship is symbolic and imaginary (van Leeuwen, 2008). Finally, the *textual*, which answers the question of how the actions, conceptual relations, and social interactions are formed into a unifying whole. The textual metafunction is realized through three systems/principles: (a) the placement of elements in concrete positions/zones (left-right, up-down, center) which endows them with the specific informational value (Given-New, Ideal-Real, Center-Margin), (b) the use of devices for creating a hierarchy of importance among the elements making some of those most worthy of attention

compared to others (*salience*) as well as the presence or absence of frames which signifies whether the elements are interconnected or not.

Accordingly, the necessity for developing and using a metalanguage that relates to the investigation of image/text relations in teaching of literacy and learning are crucial for the students from the perspective that enables them to speak, to critically think and negotiate the "new" forms of text. Given that little research has been conducted to date in the classroom for the pedagogic utilization of both aspects of "visual grammar" and other similar emerging grammars, the purpose of this study is to investigate the way in which the adoption of a common image/text relations metalanguage in educational practice may function as an effective, supportive and productive framework for critically negotiating, and mainly, for composing intermodal meanings.

2. Methodology

2.1 Participants

Forty-six sixth-grade students who attend a state primary school in the city of Ptolemaida, northern Greece participated in the study.

2.2 Material

The materials used in the study consisted of: (a) informational, print-based multimodal texts on earthquakes and, (b) compositions produced by students in the context of a written discourse classroom activity. In the framework of this activity the students were called, at first individually and then in groups, to create a leaflet on the protection from earthquakes, intended to be included in the school newspaper. It is worth noting that this paper focuses on the comparative qualitative analysis of initial and final groupwork compositions produced by three, (A, B, and D), of the four working groups of one of the two teams of intervention which displays particular interest.

2.3 Research Design

The overall research is designed on a pre-test phase, an instructional intervention phase, and a post-test phase. In particular, in the pre-test phase, the students produce their initial, individual and groupwork, texts. The teaching intervention phase included three stages: (a) the Introductory Stage, which was organized around two sub-stages: (a_1) familiarity with the concept of multimodality, and (a_2) familiarity with the principles/systems of composition, (b) the Main Stage, which involves the modelling of teaching the metalanguage of "visual grammar", and (c) the Independent Learning Stage, which consists in the implementation of the principles/systems of composition for the autonomous production of multimodal texts. Finally, in the post-test phase, students are invited to produce their final texts by revising their initial ones.

More specifically, with regard to the individual stages of intervention, at the stage of familiarity with the concept of multimodality and the principles/systems of composition, students come by contact with the metalanguage of "visual grammar" as a tool for analyzing and composing multimodal ensembles through activities of directed discovery, and this process is implemented in a systematic way. This stage was designed in order for students to be able to "decode" the operation and the means towards realization of each element of composition. This "decoding" of principles will facilitate the identification of implied organizational structure of the elements of semiotic codes that co-exist in each multimodal ensemble, which coincides with the arrangement axes of their components (vertical, horizontal, center). At the stage of the modelling of teaching the metalanguage of "visual grammar", in which multimodal ensembles are de-constructed and re-constructed on the basis of the principles/systems of composition, students are called to identify and analyze the features of each participating semiotic mode and their intersemiotic synergies for constructing specific meanings and they are driven to discern and understand the ways of their co-articulation. Finally, during the stage of independent implementation of metalanguage by the students, which virtually coincides with the post-test phase, students engage in the revision of their initial texts – individual and groupwork – as a result of interaction with peers or members of their working groups. The following table provides a recapitulation of the research phases and stages of the teaching intervention.

Table 1. Research phases and stages of teaching intervention

Phases	Objectives	Activities
I. Pre-test phase	Detecting the prior knowledge of students	Production of the initial texts
II. Teaching intervention phase	*1^a. Introductory Stage*: Familiarity with the concept of multimodality	
	1^b: Introductory Stage: Familiarity with the principles/systems of composition	
	2: Main Stage: Modelling of teaching the metalanguage of "visual design" (principles/systems of composition)	De-construction/re-construction of compositional elements and their intersemiotic synergies in various multimodal ensembles
	3: Independent Learning Stage: Implementation of the metalanguage by the students	Revision of the initial compositions by the students
III. Post-test phase	Self evaluation	Production of the final texts

2.4 Categories of student compositions analysis

Compositions produced by students were analyzed on the basis of the following four criteria: (a) the modes of signalling information, (b) the forms of different semiotic modes integration, (c) integration codes of different semiotic modes, and (d) the kind of interaction between semiotic modes, *intersemiotic synergy*. Detailed presentation of the compositions' analysis variables and their sub-variables is provided in the Table 2.

Table 2. Categories of student compositions analysis

1. Modes of information signalling
a. Verbal mode in conjunction with the utilization of "sign-makers" of multimodality (monomodal/verbal texts)
• Organization of verbal information (titles, subtitles, numbering, bullet points)
• Typographic techniques (coloured fonts, underline, font size, upper/lower case font, bold)
• Text frames (linear and non linear, monochrome & colourful)
b. Verbal & visual mode in conjunction with the utilization of the visual code affordances (multimodal ensembles)
• Use of a broad variety of saturated and non saturated colours and visual means
• Processed and non processed visual means (degree of the representation detail)
2. Forms of different semiotic modes integration
a. Unconscious
b. Conscious /Motivated
3. Integration codes of different semiotic modes
a. Implementation of information value realization principles
• Structure along the horizontal axis
• Structure along the vertical axis
• Structure along the dimensions of centre and margin/triptych
b. Implementation of salience realization principles
• Presence of hierarchy/salience → way of representation
• Absence of hierarchy/salience
c. Reading path
• Linear/semi-linear – encoded
• Non linear/non serial – interactive → cohesive ties
d. Implementation of elements' connectivity realization principles
• Presence of strong framing: disconnectedness of information
• Presence of weak framing: connectedness of information
4. Kind of interaction between semiotic modes
a. Intersemiotic concurrence
b. Intersemiotic complementarity
c. Intresemiotic divergence

3. Results

3.1 Comparative qualitative analysis of the initial groupwork compositions

The qualitative comparative analysis of the initial compositions of all working groups, reveals that in their entirety they are characterized by: (a) the predominance of the verbal against the visual code, (b) ideological/representational concurrence in terms of image/speech interaction, with the exception of the composition of the 3rd working group, (c) vertical arrangement of their elements, which entails vertical semi-linear or linear reading path, and (d) absence of intense or high saturation colours or representational details.

In particular, the initial composition of the 1st working group (see Figure 1[a]) displays visual organization of the verbal part through underlined lowercase font titles-subtitles, with the title, however, not differentiated from the subtitles, as well as alignment of bulleted instructions. The image, on the other hand, utilizes low saturation colours and minimal design, while the person depicted under the table establishes some kind of communication with the readers/viewers by directly addressing them as to what they should do, forming in this way a kind of imaginary relationship with them.

With regard to the ways and integration codes of different semiotic systems, the elements – verbal and visual – are

ordered on the basis of the "unconscious" vertical axis of structuring, with the verbal elements to be placed in the upper part of the composition, in the zone of Ideal – tending to a kind of generalized information like "in case of an earthquake, we should remain calm" – and the visual at the bottom, in the zone of Real – tending to a kind of specifying the verbal assertion of the upper half, showing us "what to do" in the event of an earthquake. The fact that the image "presents" one of the cautions that must be taken by someone in order to be protected in the event of an earthquake, suggests meaning equivalence with verbal rendition "to get under the table ..." making it necessary for the construction of its meaning the integration of such information from the verbiage; as a result the interaction between visual and verbal element can be characterized as representational concurrence. The structuring of elements along the vertical axis imposes a vertical semi-linear reading path, while the use of empty space for dividing verbal information from the image conveys to the readers/viewers a sense that all the elements should be seen as a whole.

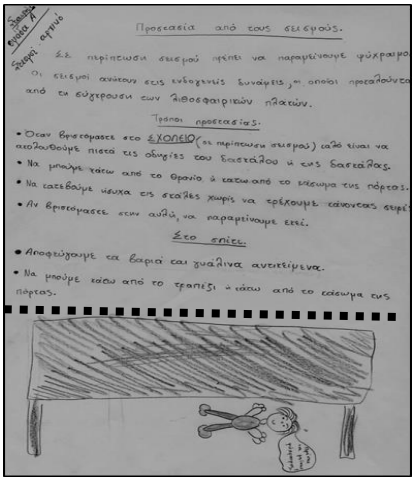

Figure 1[a]. Initial Composition of Group$_A$

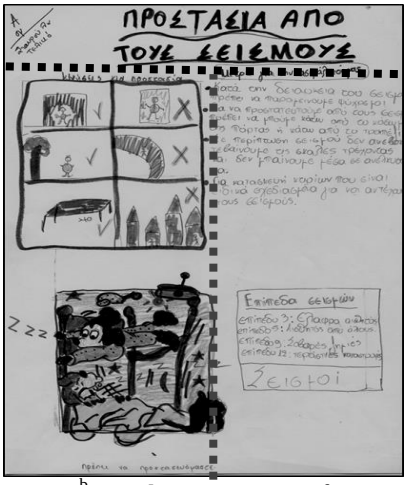

Figure 1[b]. Final Composition of Group$_A$

Similarly, the initial composition of the 2nd working group (see picture 2[a]), is characterized by the absence of colours in both the verbal and the visual part. The verbal text is organized below the underlined lowercase font title, the importance of which is enhanced by the use of exclamation mark, while the instructions are numbered. Also numbered visualized instructions in the lower part of the composition exhibit absence of representation of detail which, however, levelled by both the explanatory captions that are in their vital space and the information in the main (verbal) text. Although it can be seen that involves a high degree of redundancy across modes in the sense that iteration of verbal meaning is implied in the images, in fact is not the case, as the images depict "scenes" protection from earthquakes by reformulating the meaning/content of linguistic rendering. As a result, the interaction between visual and verbal mode could be characterized as representational concurrence.

The elements of the composition as a whole are organized along the "unconscious" vertical axis, with the verbal elements dominating at the upper point and the visual being placed at the lower. This arrangement also imposes a vertical semi-linear reading path while the composition is characterized by the existence of weak connectivity between the verbal and the visual elements, as the framed visualized protection measures against earthquake can be considered as autonomous units of meaning.

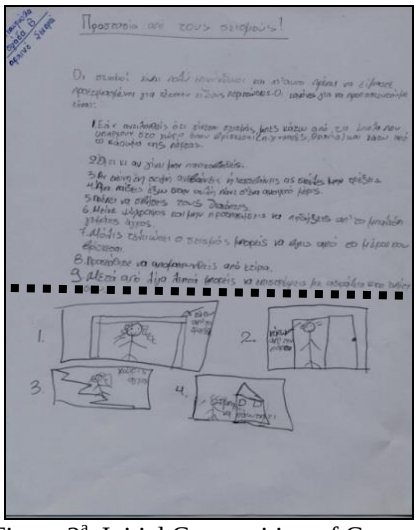

Figure 2[a]. Initial Composition of Group$_B$

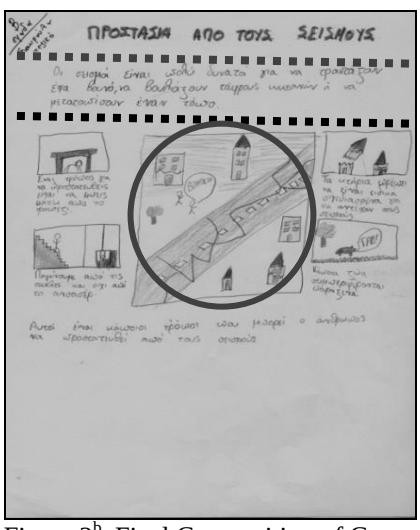

Figure 2[b]. Final Composition of Group$_B$

Finally, the initial composition of the 4th working group (see Figure 3[a]) is marked by the absence of colours of both the verbal and the visual part, absence of the verbal text organization due to the lack of title, as well as by the absence of representation of detail. As a result, the issue of visual display of how the phenomenon of the earthquake is created may not be instantly recognizable if detached from the main text. Students in this group are using the image in order to "explain" the phenomenon of the earthquake, exemplifying through this the abstract verbal explanation. However, although image and text give the impression that they follow different routes, in essence the relationships between them are characterized by representational concurrence in the sense that the image serves to visually be "reformulated" what already has been said verbally.

Once again the "unconscious" vertical axis structuring the elements is utilized, with the verbal part to be placed at the upper half of the composition, in the zone of Ideal, while the visual is positioned at the bottom half, in the zone of Real. This arrangement imposes a vertical linear reading path, while the connectivity among elements may be characterized as strong due to the absence of frame lines between the verbal and visual components of the composition.

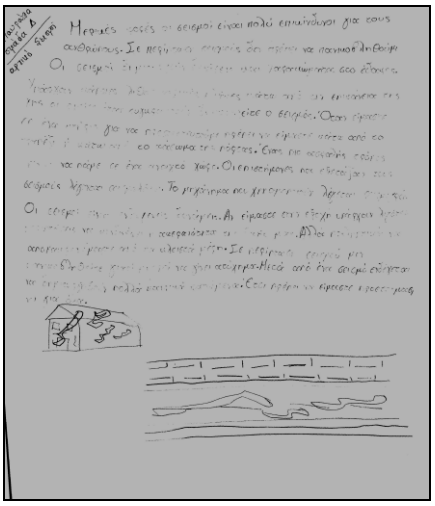

Figure 3[a]. Initial Text of Group$_D$

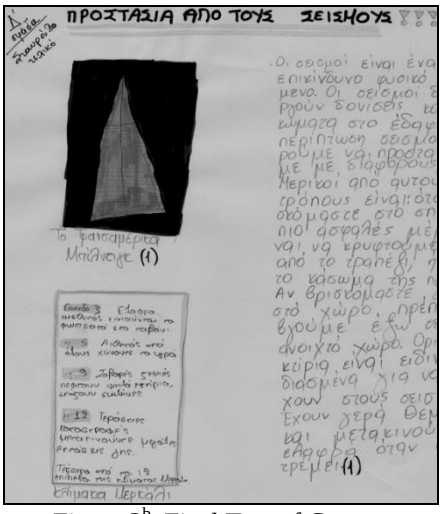

Figure 3[b]. Final Text of Group$_D$

3.2 Comparative qualitative analysis of the final groupwork compositions

The impact of teaching intervention is evident in the final compositions of all the working groups, which seem to differ from their original ones in terms of the diversity concerning the organization of their information. In general, what seems to be given prominence to, in the final groupwork compositions, is the balanced utilization of verbal and visual code, the ideological/representational complementarity with regard to image/language interaction, the mixture of organizational structures which contribute to a non-linear, non-sequential reading path as well as the presence of intense and high colour saturation and representation of detail. The only exception seems to be the composition of the 3rd working group where still the verbal element prevails.

Specifically, in the final composition of the 1st working group (see Figure 1[b]) the increased visual organization of verbal elements, such as aligned texts, a strongly differentiated oversized title in upper case font, subtitles and underlining the important information, bullet points and boldface keywords, in addition to the visualized instructions in the form of frames which compose the visual means titled "Measures for our Safety", collectively contribute to the visual promotion and classification of information in order to facilitate the reader/viewer to perceive directly and clearly the transmitted message. In addition, the presence of intense, high colour saturation and representation of detail facilitates the faithful rendering of the messages the visual depictions represent.

The elements of the composition as a whole are arranged along the vertical axis, with the title "Protection from Earthquakes" forming a "visual boundary" between the upper part and the lower part; the former offers to the reader "connotations" as to what will follow, whereas the latter provides specialized information on safety measures and intensity of earthquakes. The elements, however, of the lower part of the composition are organized along the horizontal axis, where in the left zone the visual elements are placed as the Given and familiar to the reader, whereas in order to obtain more information, the reader/viewer should move to the right zone, in which New knowledge is provided through the verbal semiotic code. In this way, a sense of complementarity between the visual and verbal elements is given, resulting in a continuous movement from left to right, that is from the side of the already "known" to the side of the basic information.

Nevertheless, the zone that captures the attention of the reader is on the left due to the existence of coloured visual representations that make it equally dominant, while the reading path guiding to their viewing, continues the imposing title, which is foregrounded by its size, to end up in the verbal part. Such a design provides warning in the case of an earthquake, which is initially offered visually, therefore it becomes directly understandable through the table entitled, "Measures for our Safety", but also verbally by supplying information on "Earthquake Intensity" through the table visually supported with the use of a cartoon representation. Furthermore, the empty space between the two information units from which one is related to measures for our safety and the other to the intensity of earthquakes, as well as the

framing of both the visual representations and the verbiage, "Earthquake Levels" highlight the individuality and diversity of each (information) group, indicating that they operate as separate units and not as a single unit of information.

A similar mixture of organizational structures is exhibited in the final composition of the 4th working group (see Figure 3b), which as a whole arranges its elements along the vertical axis, with the title also functioning as a "visual boundary" between the upper and the lower part, although it presents a horizontal layout of components. In the left area, the knowledge considered as Given and familiar is provided through the image and the table, while knowledge that the reader encounters for the first time, that is New knowledge, is placed in the right zone and provided through the verbal semiotic mode. In addition, the composition of this group carries an individual structure which divides its elements on the vertical axis, the visual of Transamerica Building with its corresponding caption. The visual representation is placed in the upper zone expressing the Ideal of seismic protection, while in the lower zone the caption provides accurate, practical information – an example of earthquake resistant building – which is perceived as the Real.

The blue visual of Transamerica Building is considered to be the point of entry into the composition, on account of the size and intensity of blue colour, while the title captures the next position to be read due to the proximity to the visual of Transamerica Building. At the same time, the title also claims the first position in the hierarchy of importance regarding the elements of composition, the arrangement of which indicates a non-linear, interactive reading path since the reader's gaze moves between the verbal and the corresponding visual, in the sense that the verbal text prompts the viewing of the visual means (and vice versa) via the cohesive ties the numbering provides across the two semiotic modes. The intersemiotic complementarity, however, between the image and the main text is not only guaranteed by the "crossmodal" cohesive ties, but also by the fact that the image provides additional information about the topic of seismic buildings referred in the verbal text, introducing an "example" of such a building.

It is evident, that this composition was designed to be read as a single unit of information, since the connectivity between the visual and verbal information is increased because of the absence of frame lines, with the exception of the verbal part in the yellow box which, through the strong framing, suggests a subtle tendency towards autonomy (because of the thin frame line) and individuality in reading compared to the rest of the information of the composition.

The high degree of visual organization of the verbal part is guaranteed through coloured labelling of information, uniform alignment of text, coloured-underlined upper case font title and coloured frame. The utilization of two contrasting colours, blue and yellow, operates semiologically in the sense that their selection is not arbitrary but conscious, since it aims to transmit specific messages. More specifically, blue indicates the responsibility both of the State's agencies and recipients of the text providing protection measures against earthquake. Furthermore, the yellow colour pinpoints the risks arising in the event of an earthquake. In addition, the use of differentiated and high saturation colours reflects a more naturalistic representation of reality, which in essence remains abstract as the visual of Transamerica Building, designated by minimal details, and representation in two dimensions and the use of blue background render it more disorientating rather than facilitating.

As far as the mixture of organizational structures is concerned, the final composition of the 2nd working group can be characterized as the most complex one. In particular, although the composition of the 2nd working group (see picture 2b) is structured along the vertical axis as a whole, the most evident structure that appears at the bottom is that of the centre-margin. The visual centre sets the "visual balance" of the composition, occupied by the dominant visual representation of a street cracked because of the earthquake, imposing its presence due to its disproportionate size and its position against the other elements, thus, directly and quickly conveying to the reader the main message/theme of the composition. The other four smaller visuals along with the accompanying verbal texts, but also the independent verbal elements, are distributed evenly around the image of the centre, ensuring the balance of the visual field. Each of the four smaller visuals of the composition is structured on the vertical axis where the visualized safety measures considered as the generalized message of each subset is placed on the upper section as the Ideal, while the accompanying texts-captions of images which provide specialized information are placed on the lower section as the Real. Similarly, an Ideal-Real structure is also used in the upper half of the composition, with the title constituting the generalized essence of the information as opposed to the rest of the verbal part which presents more practical information, for example, some of the consequences of the earthquake.

The organization of the information in the lower half of the composition along the dimensions of centre and margin suggests a non-linear, circular reading path, which starts from the dominant central visual, proceeds to the heading and sequentially continues towards the images in the margins with the verbal sections. With regard to the interplay between the image and the language, in the case of the margins it is characterized as representational concurrence in the sense that marginal images transmit the central theme the composition deals with for the construction of meaning necessitating by the integration of the verbal texts. However, in the case of the core issue it is characterized as representational complementarity since the image includes information not explicitly mentioned in the main text, but implied in the verbal rendering following immediately below the title.

At the same time, the constituent elements of the composition, through the use of empty space as a natural divider between them, exhibit increased connectivity since the composition was designed to help the reader understand that the information placed in the margins, belongs thematically to the central message of the composition that is transmitted by its visual centre.

The increased visual organization of information is ensured by the circular arrangement of frames around the central

visual means, the coloured upper case font title, and the plethora of visual depictions that contribute as a supplement to the dominant centre, as well as the saturated colours that "dress" the visual message of the composition in a more naturalistic way. The visualized protection moves-actions against earthquakes draw the attention of the readers/viewers, urging them to take specific protection measures.

To sum up, the transition from the initial groupwork compositions to the final ones, seems to be marked by the following semiotic options (see table 3) detected in almost all of the final revised composite texts:

• both semiotic modes, the verbal and the visual, are equally utilized, thus allowing the construction of intermodal meanings

• the intersemiotic synergies of modalities involved in their design, fall under the category of ideological/representational complementarity, in the sense that the images principally convey the main information by extending or illustrating the topic of the (verbal) text

• a variety of self-conscious, structures for arranging information is used, suggesting that students abandon the customary organization of vertical axis which has indirectly been applied through its exclusive engagement with the verbal code, thus creating multimodal ensembles characterized by non-linear, non-sequential reading/viewing which are sources of multiple meanings

• a high degree of verbal and visual organization of information is displayed, consisting in the utilization of typographical devices in the verbal mode, intense and saturated colours acting as carriers of meaning, and representation of detail.

Table 3. Summary of the transitional semiotic options from the initial compositions to the final ones for all the working groups

Semiotic Processes		**Groups**								
		Group A	**Group B**	**Group C**	**Group D**		**Group A**	**Group B**	**Group C**	**Group D**
Modalities	**Initial compositions**	Visual & verbal semiotic mode with predominance of the verbal element				**Final compositions**	Visual & verbal semiotic mode			
							Equal Use	Equal use	Predominance of verbal element	Equal use
Spatial relationship of information		Vertical arrangement: Semi-linear/linear reading path					Mixture of organizational structures: Non linear, non sequential reading path			
							Vertical & horizontal	Vertical & centre	Vertical or/and centre/ vertical triptych & centre/ horizontal triptych	Vertical & horizontal
Intermodal interaction/ synergy		Intersemiotic concurrence		Intersemiotic complementarity	Intersemiotic concurrence		Intersemiotic complementarity			
Visual organization of information		Absence of intense, saturated colours, minimal design					Presence of intense, saturated colours, representation of detail			
		Utilization of typographic techniques			—		Utilization of typographic techniques			
		Titles, subtitle, bullets	Title, numbering	Coloured title, numbering			Coloured titles/subtitles, bullets, text frames, underline, cohesive ties			

4. Discussion and Conclusions

The present paper focuses scientifically on the educational implications deriving from the exploitation of aspects of the metalanguage of 'visual grammar' by Kress and van Leeuwen (1996, 2006) in school contexts for the development of skills facilitating the construction of intermodal meanings by primary education students. Considering the analysis of the compositions, in particular the final ones, it is obvious that the skills of designing multimodal meanings consist of the following semiotic processes:

The students effortlessly choose to *equally utilize both semiotic codes, namely the visual and the verbal*, in order to construct their meanings which are – by now – characterized as *multimodal/multisemiotic*. The incorporation, however, of the two semiotic codes involved is attained in a *conscious* way, in the sense that all the co-present modal components of each composite text are organized on the basis of particular structural axes, as a consequence of understanding of the relations among the modalities which co-function for the construction of meaning through the application of the principles/systems of composition.

More specifically, the students *exploit the principles of realization of the information value* which can be added to an element according to its position in a composition, while experimenting through the use of a variety of axes of arrangement (vertical axis, horizontal axis, structure in the centre-margins/triptych), in order to organize the elements in their texts.

Furthermore, they *apply the realization principles regarding the hierarchy of importance* among the elements of various semiotic modes, thus rendering some of those worthier our attention in comparison to others through the use of visual clues, such as the placement of the images in the visual field, the size, the contrast of colours or the uniqueness of one visual so as to connote its "information load". For example, the arrangement of the pictures on the left, the zone of the Given, in the final composition of the first group (see Figure 1[b]) makes them the most salient element, thus attracting the attention of the reader/viewer more than the others.

The way of arrangement of the information in conjunction with the prioritization of significance of the elements construct *diverse non linear, unstrictly encoded reading paths* in the compositions, which are directly intertwined with the spatial allocation of the elements they are comprised of. Thereby, they constitute sources of multiple meanings, in the sense that although they provide to the readers some hints for the 'likelier' hierarchy of salience, in essence they let them choose their own reading mechanisms. As an outcome, the students shift from the familiar linear, vertical sequence and connection among the elements to more flexible ways of reading and regimes of control over the meaning.

Simultaneously, *the exploitation of realization principles regarding the framing of elements or groups of elements* in the compositions underlines the fact that the makers comprehend the ways through which the connection or disconnection of the information can be attained. Moreover, they are aware of the function of the weak as well as the strong visual framing, since they both were used in their compositions in order to denote the homogeneity among certain informational items or the individuality and differentiation of some others respectively.

With respect to the *interaction of semiotic modes implicated in the co-articulation of meanings*, the intersemiotic complementarity constitutes a fundamental parameter for the construction of relations between image and text in the final compositions of the students. This entails that the construction of meaning from the visual representations presupposes the incorporation of information from the verbal text and vice versa. In contrast, the initial compositions are – in the main – characterized by intersemiotic coincidence, since the images reformulate or clarify what is represented via the language.

Additionally, the *enhanced visual organisation* of the verbal code contributes up to a certain degree to the configuration process of the *intersemiotic synergies* among the modes involved for the design of the composite texts. Specifically, "visual" indicators such as titles, subtitles, mechanisms of emphasis, for instance, bold, bigger or coloured letters or underlining, numbering or bullets, tables or frames of texts are extensively used. What we notice is that the more they are utilized, the further written speech functions as a visual element, as 'space' communicating meaning beyond its content, as long as their role lies in attracting the reader's attention as 'salient' signs, thus contributing to the prioritization of the composition elements.

Last but not least, the high degree of utilizing the resources in the visual mode, for instance colour, ensures that the visual representations are in a relation rather *supportive to the verbal code* which, however, is gradually *transformed to explanatory*, thus adding a bigger "information load" to the images rather than the verbal text, without implying that its role is weakened.

The analysis of the compositions of the students, at the initial point of reading/viewing, which focuses on the development of skills for the design of multimodal meanings leads us to interpretations originally concerning the explicit, direct meanings which are related to the intermodal utilization of affordances revolving around the two semiotic modes, the visual and verbal. However, the metalanguage of 'visual design' which draws on the social semiotic approach, deals with the texts as 'signs', not only as sources of explicit, but also implicit meanings. Furthermore, it gives us the opportunity to look into the texts by interpreting them in conjunction with the findings deriving from the utilization of the semiotic affordances of the involved codes and detect the implicit intentions/points of view or tendencies of the students as makers/designers of texts. By adopting, but also extending, the stance of the pioneers of the metalanguage of "visual design", specifically Kress & van Leeuwen (2006), we would say that the compositions of the students were created through the use of strategies which are construed as semiotic acts connoting, explicitly and

implicitly, their perspectives and intentions.

By attempting to interpret, in general, the point of view shaped by the students towards the construction of multimodal meanings, we observe that via the method of arrangement and organization of the elements of their *initial texts*, their main goal is to present simply their knowledge, especially quantitatively, something which they have been trained for over so many years at school. This explains the dominance of the verbal over the visual code in their initial compositions, since the prevailing stance in typical school education is that language constitutes the sole and most complete means for meaning-making, thus disregarding its partiality, which emerges in the newly-formed communication terrain where the meanings are not conveyed monomodally but multimodally, with each mode displaying its own representational potential in addition to its restrictions.

The participation of students in the teaching intervention, during which they came in contact with the variety of modes used for meaning-making through the negotiation of multimodal texts, contributed not only to the comprehension of the way in which one semiotic system is related to another for the design of this kind of texts, as is indisputably manifested in the utilization of multiple modalities for the transmission of messages in their *final compositions*, but also the comprehension of the nature and possibilities of utilizable resources. This is demonstrated by the semiotic choices of the students towards the alternatives which they initially had in mind for the creation and transfer of particular meanings/messages; a fact which entails the change of attitude towards the final recipient of their texts, since they were the first in the position of maker/designer of a multimodal ensemble.

At the same time, the students of the experimental classes developed *visual literacy skills*, a finding which goes along with the findings of interrelated international researches which support that the involvement with multimodal texts contributes to the comprehension of the function of the visual semiotic code and, by extension, to its utilization (Unsworth, 2006; Unsworth, Thomas, & Bush, 2004; Callow, 2003; Callow & Zammit, 2002). It is apparent that the students no longer produce texts in the classical sense of the term– monomodal following a linear course –but create texts by designing them methodically and systematically. They are engaged in processes of composition, where the composition as a concept encompasses the combinatory plurality and complexity of 'open-ended' meanings, namely meanings which can be subjected to multiple and polysemous interpretations by designing and orchestrating various semiotic modes and various elements-meanings on different levels. *The visual mode is evidently dominant* in the realization and conveyance of meanings and it is the one which now *defines the organization and construction of the elements in their compositions* which are arranged on "conscious" structures, with the verbal semiotic mode utilized simultaneously. The choice of clarity for the rendering of the visual means in the compositions via the visualized representation of the safety measures against the earthquake, in combination with the various coloured choices, confirm the skills of utilization of the affordances of the visual mode developed by the students during the intervention.

Therefore, it becomes clear that the metalanguage of the "visual design" constitutes a truly promising, and pedagogically utilizable tool for the description, interpretation and comprehension of the interactions among the various semiotic modes co-existing in multimodal ensembles, contributing to the development of multimodal and visual literacy by primary education students. Although it is proven that the metalanguage in question contributes to the interplay of the various semiotic resources for meaning-making, further research and study should be conducted in order to investigate all the dimensions of the emerging field of multiliteracies in the educational practice.

As a consequence, this particular metalanguage is transformed and transubstantiated into a *practical tool of critical negotiation and construction of intermodal meanings* although it is initially used as a theoretical tool simply for describing the elements of construction of the visual system. The contribution of the metalanguage at this level is reflected on the possibility of parallel utilization of all three principles/systems of the composition which, stemming from the decoding process as deconstruction and as reconstruction of the interactive elements and relations of the spatial arrangement, configure a flexible functional frame of implementation and further investigation and development in the domain of multimodal representation of discourse within the framework of the pedagogy of Multiliteracies. This entails the need for adoption and incorporation of such a metalanguage for the design of curricula facilitating the teaching of literacy, in order to reframe the monomodal nature of communication and enable the emergence of supplementary interrelation to which the verbal and the visual mode are liable. What seems to preoccupy us and which requires further investigation, lies in the question as to what degree the educators are supplied with the appropriate means to evaluate the meanings created by students in different modes at the moment when the school system focuses exclusively on the verbal mode.

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