A Comparative Study of Intersemiotic Complementarity of Visual and Verbal Modes in Three English School Textbooks from Iran and Malaysia

Arefeh Sadat Khoshniyat[1] , Majid Amerian[2*]

1. PhD student, Department of English Language and Literature, Arak University, Arak, Iran.
2. Associate Professor, Department of English Language and Literature, Arak University, Arak, Iran (Corresponding Author).

Purpose: The integration of visual and verbal modes in educational materials, particularly in school textbooks, plays a chief role in enhancing the learning experience. Thus, the present study aimed to analyze the intersemiotic complementarity of verbal and visual modes in three English school textbooks from two countries with different policies toward English education at public schools, Iran and Malaysia.

Methodology: Employing a qualitative descriptive approach, this study analyzes the intersemiotic complementarity within English school textbooks used in the first grade of high school in Iran and Malaysia, focusing on three selected textbooks: Prospect 1 (Iran), Form 1 (Malaysia), and Pulse 2 (Malaysia). The analysis was guided by Royce's (1998) framework for intersemiotic complementarity, with a particular emphasis on the ideational metafunction. This involved examining the coherence between visual representations (images) and textual content (dialogues) to assess how these elements complement each other in conveying educational content and facilitating learning.

Findings: The analysis revealed a marked disparity in the integration of visual and verbal modes between the textbooks from the two countries. Iranian textbooks, specifically Prospect 1, demonstrated a significant disconnect between images and text, often leading to confusion and potentially hindering students' learning. In contrast, the Malaysian textbooks (Form 1 and Pulse 2) exhibited a high level of intersemiotic complementarity, with images effectively supporting and enhancing the textual content, thereby facilitating a more cohesive and comprehensible learning experience for students.

Conclusion: The study demonstrates the importance of cohesive integration of visual and verbal elements in textbooks to support effective learning, highlighting the need for strategic multimodal design in educational materials. By ensuring a cohesive integration of visual and verbal elements, textbooks can become more effective tools in enhancing comprehension and improving learning outcomes. This research contributes to the growing discourse on multimodal education, suggesting pathways for future investigations into the optimization of textbook design for enhanced educational impact.

1. Introduction

The integration of visual and verbal modes in educational materials, particularly in English school textbooks, plays a pivotal role in enhancing the learning experience. Royce's (1998) concept of intersemiotic complementarity, which underscores the collaborative relationship between visual and verbal modes in conveying meanings, serves as the foundational framework for this analysis. This concept finds relevance across different mediums, including educational materials and multimedia learning environments, as highlighted by Haris et al. (2023), Istighfaroh et al. (2022), and Plass et al. (1998), who emphasize the importance of integrating verbal and visual information to enhance learning outcomes.

Further exploration into intersemiotic relations in diverse contexts such as film dubbing (El-Nashar, 2023), visual protests (Nurfaizah, 2022), and language learning through comics (Pazaer & Assaiqeli, 2023) enriches our understanding of how visual and verbal modes complement each other. The integration of these modes in educational materials, such as EFL textbooks, science textbooks, and health promotion posters (Sugianto et al., 2021; Koutsikou et al., 2021; Khusna & Hardjatno, 2022), offers varied perspectives on their effectiveness in facilitating learning.

Building on the theoretical foundation laid by Halliday's Systemic Functional Linguistics, which emphasizes the role of social contexts in meaning-making (Damayanti & Febrianti, 2020), the study leverages the ideational, interpersonal, and textual metafunctions to analyze the interplay between visual and verbal elements. The adoption of sociocultural and social semiotics frameworks further aids in understanding the semiotic resources and affordances of multimodal products (Smith, 2018; Ling & Fu, 2019).

Royce's framework has been applied extensively across various disciplines, analyzing multimodal texts in educational settings, social movements, and even in critical literacy practices (Sugianto et al., 2021; Memon, 2021; Pederson & Myers, 2021). This widespread application underscores its utility in examining the nuanced interactions between verbal and visual modes across different contexts. In the realm of educational materials, the focus on the ideational metafunction has been paramount, with studies exploring how images support or enhance textual meanings in textbooks and other educational resources (Cahyani et al., 2021; Jerome & Ting, 2021; Sugianto, 2021). The interpersonal and compositional metafunctions have also received attention, shedding light on the ways images and text convey social interactions and organize meaning within educational texts (Lopez-Ozieblo, 2021; Haider, 2022; Cmeciu, 2022).

The theoretical underpinnings of intersemiotic complementarity, as proposed by Royce (1998) and supported by the work of Haris et al. (2023), Istighfaroh et al. (2022), and Plass et al. (1998), provide a robust framework for examining the synergistic potential of visual and verbal modes in textbooks. This comparative analysis between Iran and Malaysia's English textbooks offers a unique opportunity to understand how different educational systems approach multimodality in textbook design, thereby contributing to the broader discourse on effective educational practices.

Furthermore, the study addresses a critical gap in existing research by focusing on the ideational, interpersonal, and compositional metafunctions within textbooks, as highlighted by Damayanti & Febrianti (2020) and Sugianto et al. (2021). The exploration of these metafunctions in the context of English education in Iran and Malaysia is essential for identifying best practices and potential areas for improvement in textbook design. Thus, the present study aimed to analyze the intersemiotic complementarity of verbal and visual modes in three English school textbooks from two countries with different policies toward English education at public schools, Iran and Malaysia.

2. Methodology

The study is qualitative and descriptive, utilizing Royce's (1998) framework for intersemiotic complementarity between linguistic modes and images. This approach is rooted in Halliday's metafunctional communication theory and further influenced by Kress and van Leeuwen, and O'Toole's reinterpretation of metafunctions. It focuses on how language and images semantically complement each other. The primary focus is on the ideational metafunction, analyzing the semantic integration of visual and verbal modes. This

involves examining the represented participants, activities, circumstances, and attributes within the visual elements of the textbooks, and how these align with the verbal narratives to facilitate learning.

The corpus includes images and dialogues from three English textbooks: Prospect 1 (Iran), and Form 1 and Pulse 2 (Malaysia). The selection includes both locally produced and imported textbooks to compare the effects of different production approaches on intersemiotic complementarity.

The analysis procedure unfolds in a systematic manner, beginning with the examination of visual meanings in the images from the Prospect 1 textbook, followed by identifying and relating these visual elements to the verbal dialogues within. This process is replicated for the Form 1 and Pulse 2 textbooks, enabling a comprehensive exploration of the intersemiotic complementarity between visual and verbal modes in each case. The study concludes with a comparative analysis across all textbooks to assess the extent of semantic integration and its effectiveness in enhancing the educational content.

3. **Findings**

The following tables show the visual elements and meanings extracted from the images accompanying each dialogue section found in the concerned textbooks in the rows shaded by gray. In the rows below each row containing the visual elements, verbal ones are mentioned in the form of sense relations and the number of their occurrence. Obviously, this was done due to limitation of space. For the same reason, the attributes are not mentioned in the form of elements as they are a lot and they are not required to be mentioned in the texts. As it is known, the attributes of the characters (age, clothes, color of clothes, eyes, hair, etc.) are drawn, imaged or photographed in images and pictures as an integral part that cannot be separated from the nature of the images. So, it is justified that they are not necessary for the content of all texts unless the content of the text is about those very attributes.

Table 2 shows the ideational intersemiotic complementarity of visual and verbal modes in *Prospect 1* from Iran.

Table 2: Ideational Intersemiotic Complementarity in *Prospect 1* from Iran

Ser.	Identification			Activity		Circumstances			Attributes
1	Teacher	Students		Explaining/teaching		Classroom			Attributes
	1H, 2R	2H, 3R		0		1R			0
2	Teacher	Students		Teaching/explaining/asking questions		Classroom			Attributes
	1R	2H, 1R		2H, 4C		1R			0
3	3 students			Greeting/introducing		School			Attributes
	6H, 1C			7C		1R			0
4	Librarian	Student		Giving and taking		Library	Library card		Attributes
	IR	IH, IR		IC		0	2R		0
5	Teacher	Student 1	Student 2	Asking and answering questions		Classroom			Attributes
	1R	2H	2H	3H		0			0
6	Student 1		Student 2	Explaining something from the book / reviewing		School	Book		Attributes
	2H		2H	0		0	0		0
7	Student 1		Student 2	Showing a picture		Chair	Desk	Book	Attributes
	1R		1R	1R, 1C		0	0	0	0
8	Student		School secretary	Asking questions from student		School office			Attributes
	1 R		1R	2H		0			0
9	Two men	Student	A man	Introducing/greeting	Showing	Book	Folder	Drawer	Attributes
	4H, 1R	1H	1H	0	1C	0	0	0	4R
10	2 students		Teacher	Explaining from the book /showing		Book			Attributes

	1R	2R	0		0		2R
11	Woman	Boy	Arriving from school, asking for lunch		Kitchen		Attributes
	1H	1H	1R, 1C		1R, 1C		0
12	Students	Teacher	Pointing to a picture and asking questions/teaching		Classroom	Book	Attributes
	2H	1R	2H, 2R		0	0	0
13	Student 1	Student 2	Taking notes	Explaining/retelling/ reporting	Pen	Paper	Attributes
	2H	1H	0	0	0	0	0
14	3 men		Typing	Showing/pointing something on the paper	Office		Attributes
	1H, 1R		0	0	0		0
15	Student 1	Student 2	Explaining/teaching	Home	Book	Pen	Marker	Attributes
	1R	1R	1H	0	0	0	0	0
16	Students	Teacher	Asking a question		Classroom		Attributes
	1H	1H, 1R	1H		0		0

R=Repetition, S=Synonymy, A=Antonymy, M=Meronymy, H=Hyponymy, C=Collocation

As the data reveal, the participants are clearly depicted in the images as well as in the language of the dialogues. Regarding the activity, the intersemiotic complementarity is weak as in 6 out of 16 cases, no cohesion is observed between the visual and verbal meanings. For example, the verbal meaning of the dialogue related to the row No. 1 in terms of activity is introducing. As it can be observed, the process depicted in the image is something different from the story said in the dialogue and the image does not replicate it to make learning facilitated or support the language and even hinders learning as it sets a different scene in the mind of the viewer which is totally different from that made in the language. Regarding the circumstances, the cohesion is poor. In 11 out of 16 cases, there is no verbal element related to the visual ones in the text of dialogues. Attributes are related in two cases (rows 9 and 10) in which the dialogues are about the appearance and the cohesion is clearly established.

For more clarification of the number and type of sense relations showed in the above table, the following one is presented. It is worth mentioning that the numbers in this table are for making comparisons in the very textbook analyzed in this stage, that is, *Prospect 1*. They cannot be compared with the numbers which will be mentioned for the other two books of Malaysia, because the number of pictures is not the same in the three books.

Table 3: Frequency of Lexical Cohesion Categories in *Prospect 1*

	R	S	A	M	H	C	Total
Identification	23				36	1	60
Activity	4				11	15	30
Circumstances	6					1	7
Attributes	6						6

R=Repetition, S=Synonymy, A=Antonymy, M=Meronymy, H=Hyponymy, C=Collocation

As it is shown, the decreasing trend of number of sense relations from identification to attributes is compatible with the results obtained in the above table as representation of participants is strong, that of the activity is weak, that of circumstances is poor and attributes are only represented in the related topics.

Further, the category of lexical cohesion of the highest frequency is hyponymy and repetition and collocations are in the next positions.

Table 4 shows the intersemiotic complementarity of visual and verbal modes in *Form 1* from Malaysia.

Table 4: Ideational Intersemiotic Complementarity in *Form 1* from Malaysia

#	Identification				Activity				Circumstances			Attributes
1	*Football*	*Football shoes*			*Playing football*				-			*Attributes*
	4H, 2R	2C			8C							0
2	*A boy*	*A boy*			*Video call / telephone conversation*				*Iphones*			*Attributes*
	2H	4H			7C				3H, 1C			0
3	*Two boys*	*Spaceship*	*Alien*	*Walking*	*Informing*	*Disembarking*		*Road*	*Trees*	*Torch*		*Attributes*
	6H	1R	1R,1C	0	4R, 2C	1R		0	6R	1R		0
				Landed	*Following*	*Torch shining*						
				1S, 1R	0	1R						
4	*Lid with date label*	*Shopping cart*	*A hand*	*Food*	*Shopping*			-				*Attributes*
	3R	2R	0	0	5S, 1C							0
5	*a man*	*a woman*			*Shopping*	*Telephone conversation*		*Shop*	*Home*	*Mobile phone*		*Attributes*
	1H, 1C	1H, 1C			2S	5C		0	0	1C		0
6	*3 men*	*A woman*	*Judge*	*Distressed talking*	*Requesting for money*	*Stopping/pleading*	*Ready to cut*	*City*	*Court*	*Knife*		*Attributes*
	9H	2H	2R	0	4H, 4C	2C	1R	0	2R, 3C	1R		0
7	*a girl*	*a boy*			*Telephone conversation*			*Mobile phone*				*Attributes*
	1H	1H			10C			0				0
8	*Hotel*	*Green road*	*Zoo*	*Post office*	*Giving address*			-				*Attributes*
	1R	1R	0	0	9C							0
	Plaza	*Tourist information center*	*Stadium*									
	0	2R	0									
	Black road	*T-junction*	*Bank*									
	1R	1R	0									
	Blue road	*Museum*	*Cross-road*									
	1R	1R	1R									
	Fire station	*Roundabout*	*Yellow road*									
	1R	2R	0									
9	*Snorkeling equipment*	*Backpack with tents & sleeping bag*	*Picnic bag*		*Going on a trip*			-				*Attributes*
	1R	3R	1C		4H, 6C							0

R=Repetition, S=Synonymy, A=Antonymy, M=Meronymy, H=Hyponymy, C=Collocation

As the data reveal, the participants are clearly depicted in images as well as in the language of the dialogues. In two cases where the images show a picture of some objects and map of a city for giving address (rows 4 and 8), some objects or names have no counterparts in the text which is justified as they are not required for the content of the text and meaning. Regarding the activity, all processes have sense relations in the text and the intersemiotic complementarity is strong. There are two cases of processes that can be derived out of the images but have no counterparts in the text. These cases are similarly justified as they are not necessarily required and other processes have been realized and completed the meaning. Regarding the circumstances, no relation is observed only in 1 case out of 5. So, the intersemiotic complementarity is strong. Attributes show no relations as they are not required.

Table 5: Frequency of Lexical Cohesion Categories in *Form 1*

	R	S	A	M	H	C	Total
Identification	27				31	5	64
Activity	8	8			8	54	78
Circumstances	10				3	5	18
Attributes							0

As it is shown in Table 5, the higher frequency of lexical cohesion is for the activity, then for participants and finally for circumstances, which is attributes is compatible with the results obtained in the above table. Further, the category of lexical cohesion of the highest frequency is hyponymy and collocations and repetition are in the next positions.

Table 6 shows the intersemiotic complementarity of visual and verbal modes in *Pulse 2* from Malaysia.

Table 6: Ideational Intersemiotic Complementarity in *Pulse 2* from Malaysia

Ser.	Identification		Activity			Circumstances		Attributes
1	*Student*	*Student*	*Greeting/introducing*			*School building*		*Attributes*
	1H	1H	6C			2C, 1M		0
2	*Three boys*		*Playing urban sports*	*Parkour playing*	*Skateboarding*	*Open urban spaces*	*Skateboards*	*Attributes*
	5H, 1R		3H, 8R	2R, 1C	2R	1S, 2M	1R	6R
3	*Photo of a landscape*	*Photo of a boy*	*Making a funny face to the camera*					*Attributes*
	3R, 1C	1H	1R					2R
4	*Chris*	*Registration secretary*	*Taking or asking for information*			*Active camps office*	*Leaflet*	*Attributes*
	2H	1R	1S, 1R, 5C, 5M			1S, 2R	1R	0
5	*Chris*	*Lucy*	*Showing/enjoying*			*Cafeteria*	*Mobile phone*	*Attributes*
	1R	1R	4S, 3R, 2C			0	0	0
6	*Photo of a boy*	*House*	*Earthquake*			-		*Attributes*
	1H	1H, 4R, 9M	4R, 1C					1R
7	*Lucy*	*Chris*	*Telephone conversation*			*A sofa*	*Out*	*Attributes*
	1R	1H	2S, 1R, 11C			0	0	0
8	*Zookeeper*	*Lucy*	*Asking and answering/giving and taking information*			*Zoo*		*Attributes*
	1R	1R	2S, 3C			1R, 1C, 4M		0

R=Repetition, S=Synonymy, A=Antonymy, M=Meronymy, H=Hyponymy, C=Collocation

As the data reveal, the participants have been clearly depicted in images as well as in the language of the dialogues. Regarding the activity, all processes have sense relations in the text and intersemiotic complementarity is strong. Regarding the circumstances, 2 cases out of 6 show no cohesion. Attributes in two cases (row 2 and 3) are represented, which are photos.

Table 7: Frequency of Lexical Cohesion Categories in Pulse 2

	R	S	A	M	H	C	Total
Identification	12			9	13	1	37
Activity	22	9		5	3	29	68
Circumstances	5	2		7		3	17
Attributes	9						9

As it is shown in Table 7, the higher frequency of lexical cohesion is for the activity, then for participants, circumstances and finally for circumstances, which is attributes is compatible with the results obtained in the above table.

Further, the category of lexical cohesion of the highest frequency is repetition and collocations, hyponymy, meronymy and synonymy are in the next positions.

4. Conclusion

The study's findings showed significant variations in intersemiotic complementarity across English school textbooks from Iran and Malaysia, specifically focusing on ideational aspects. In the Iranian textbook (Prospect 1), a notable disconnect was observed between visual and verbal modes, with a lack of cohesion in activities and circumstances depicted versus described. This misalignment potentially hinders learning by creating confusion or misleading interpretations for students. Conversely, the Malaysian textbooks (Form 1 and Pulse 2) demonstrated a stronger intersemiotic complementarity, with more cohesive and supportive integration of visual and verbal elements. This indicates a more effective use of multimodal resources to facilitate understanding and learning, showcasing the importance of aligning visual and verbal modes in educational materials.

By examining the ideational, interpersonal, and compositional metafunctions as outlined by Halliday's Systemic Functional Linguistics (SFL) theory (Damayanti & Febrianti, 2020; Sugianto et al., 2021), this discussion will highlight the critical role of visual and verbal modes' integration in textbooks. The concept of intersemiotic complementarity, as introduced by Royce (1998) and further explored by Haris et al. (2023), Istighfaroh et al. (2022), and Plass et al. (1998), provides a framework for analyzing how these modes collaborate to facilitate meaning-making and learning. Furthermore, drawing on the diverse applications of Royce's framework across various disciplines (Sugianto et al., 2021; Haris et al., 2023; Jabour & Faisal, 2022), the discussion will examine how the principles of intersemiotic complementarity can be applied to improve textbook design. The insights from studies on multimodal discourse, including works by Chen & Zhong (2022), Lim (2019), and Mahasneh & Abdelal (2022), will be leveraged to understand the complex dynamics of visual-verbal interactions and their impact on students' learning experiences.

In conclusion, this study highlights the critical role of intersemiotic complementarity in English school textbooks from Iran and Malaysia, uncovering significant disparities in the integration of visual and verbal modes. While Iranian textbooks exhibit a notable disconnect that could impede learning, Malaysian textbooks demonstrate effective multimodal integration, enhancing comprehension and educational outcomes. These findings underscore the importance of cohesive visual and verbal content in textbooks to facilitate learning. Notably, the application of Royce's framework in analyzing the intersemiotic complementarity in textbooks from Iran and Malaysia reveals a disparity in the effectiveness of multimodal integration, underscoring the need for a more rigorous design and selection of images and textual content to support the educational goals and enhance students' learning outcomes.

One limitation of this study is its focus on a selected number of textbooks, which may not fully represent the diversity of educational materials across Iran and Malaysia. Additionally, the analysis primarily centers on the ideational function, potentially overlooking the nuances of interpersonal and textual metafunctions in conveying meaning.

Future research should consider a broader range of textbooks and educational materials, including digital resources, to provide a more comprehensive understanding of intersemiotic complementarity. Investigations could also expand to other metafunctions, such as interpersonal and textual, to explore their impact on learning outcomes and student engagement. Moreover, educators and textbook designers are encouraged to prioritize the alignment of visual and verbal modes to enhance learning. This study's findings suggest the necessity for rigorous multimodal content evaluation and design processes, highlighting the potential for improved educational outcomes through the strategic integration of visual and verbal elements.

Ethical Considerations

In this research, ethical standards such as the principle of avoiding plagiarism were observed.

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Authors' Contributions

The student was responsible for collecting data and drafting the initial article, and the professors were responsible for the final writing of the article.

Conflict of Interest

No conflict of interest was reported in this research.

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