

The application of multimodal metaphors in senior high school English argumentative writing class

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Abstract. With the deepening of modern educational concepts and the promotion of China's New Curriculum Reform, significant changes are imperative in high school English classrooms. Although some studies have discussed the application of multimodal metaphors in vocabulary and reading teaching in senior high school and writing teaching in college, their exploration into the writing class in senior high school remains unexplored. This study thereby aims to investigate the integration of multimodal metaphors in English argumentative essay teaching and writing in senior high school. It conducts in-depth analysis by collecting data on teaching and learning. The results reveal that the application of multimodal metaphors enriches teaching content, enhances student engagement and performance, and fosters critical and metaphorical thinking skills, while some improvements also need to be considered. By incorporating multimodal elements like texts, images, audio, and gestures, this study also seeks to inspire further educational reforms and innovations in English writing classrooms.

1 Introduction

Currently, there exist pervasive issues in English writing classes in senior high schools, such as teaching materials, tools, and methods are often singular and lack innovation. The teaching target primarily focuses on test-oriented writing skills and ignores the cognitive process of thinking and learning. This paper explores the application of multimodal metaphors in high school English argumentative essay writing, which aims to break away from traditional teaching models, enrich teaching content, and apply multimodal teaching tools, such as signs, images, sound, videos, etc., to enhance students' interests and engagement in writing. Additionally, it seeks to elevate students' cognitive perspective of the language and foster critical and metaphorical thinking skills. Moreover, this paper is expected to inspire further educational innovation and reforms.

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2 Literature Review

2.1 Metaphor

Metaphor research is gradually becoming an independent and mature discipline. Cognitive linguists like George Lakoff believe that metaphor is a product of human cognition, enabling humans to understand cognitive activities in one domain by using experiences from another [1]. Subsequently, the cognitive and conceptual nature of metaphor has been widely acknowledged.

Lakoff and Johnson defined metaphor as “understanding and experiencing one kind of thing in terms of another”, and they claimed that human beings think metaphorically, and systematically metaphorize abstract, complex phenomena in terms of concrete, embodied phenomena [2, 3]. Afterward, their research continued with further in-depth study on this topic, connecting it to people’s everyday lives and exploring new perspectives, for example, their monograph *Metaphors We Live By* aroused more attention [4].

2.2 Multimodal metaphor

In a society where information technology is highly developed, various media symbols such as images, sounds, texts, and numbers lead us into the “visual” era. Communication methods such as video calls, video conferencing, and online networking make human interaction more quickly, more convenient, and more three-dimensional. Forceville’s theses put multimodal research on metaphor within the scope of cognitive linguistics. This signifies that metaphor research has overcome the bias of pure linguistics, recognizing that meaning exists not only within linguistic symbols but also within other media. Kress systematically introduced the concept of multimodality in today’s society and got people thinking about what lies beyond language under the influence of multimedia [5].

2.3 Multimodal metaphor in English language teaching

While previous researches on multimodal metaphors were mainly focused on the fields of linguistics or film and media, such as MS McGlone’s exploration of Lakoff’s theory, or Forceville’s study on films and advertising, only in the last decades has it gradually expanded to the fields of education [6-8]. As for English language teaching, with the development of technology, contemporary English teaching classrooms have incorporated many multimedia devices, which means that compared to traditional classrooms, contemporary classrooms are more technology-enhanced. Therefore, the impact of new technologies on students’ English learning has become a focus of researchers’ attention, leading to numerous interdisciplinary studies in this area. For example, some focus on teachers or teaching, while some, more recently, like Deng and Wu have studied metaphorical gestures in middle school education to provide inspiration for teachers to stimulate students’ engagement and enhance effective interaction in the classroom [9, 10]. Liu discussed the design and teaching methods of Multimodal metaphors in the College English Smart Classroom in Sports Institute by using “multimedia”, “multimode” and “multimodality” [11]. Dong studied the multimodal texts in English teaching in Internet+ education era and suggested that teachers should shift teaching procedures from linguistic texts, monomodal contexts, and similarity juxtaposition to multimodal ones and help to internalize and reinforce the learners’ multimodalized metaphoric capacities [12].

For different types of English teaching classes, an increasing amount of research or masters’ theses focus on the application of multimodal metaphors in English vocabulary and

reading teaching in both senior high school and college (e.g. [13-19]). At the high school level, research on the teaching of multimodal metaphors has focused more on the areas of reading and vocabulary learning. For instance, Li found that the application of multimodal metaphors in English reading helps senior school students comprehend the content of texts and cultivate their interest in reading [18]. He also advised that teachers should choose the reading source in concordance with students' cognitive level and the patterns of mode should be based on real conditions. Yu explored students' vocabulary performance and ability, and whether students were able to gain positive emotion by applying multimodal metaphor to senior high school English classes [19].

As for English writing classes, only a few research in college English classes have emerged (e.g. [20, 21]). On the basis of empirical methods, scholars have boldly applied multimodal metaphor teaching modes that combine graphic, audio, video, and other elements into college English classes, showing that the application of multimodal metaphor in class improves students' writing competence, arouses their interest in learning and enhances their abilities of metaphorical thinking.

Previous research mainly concentrates on the study of English vocabulary and reading teaching in senior high school and writing teaching in college. A number of studies have achieved similar results, which can be cross-confirmed with each other. However, the application of multimodal metaphors in English writing class in senior high school is still under-explored, and relevant research needs to be further developed.

3 Methodology

There are two questions for this research to explore:

1. How can teachers integrate multimodal metaphors into teaching tools and classroom activities in writing classes?
 2. How do students use multimodal metaphors in English argumentative writing?
- Based on those, this research uses a mixed-methods approach.

3.1 Participants

For this empirical study, a public high school from Chongqing Municipality in southwestern China is chosen. The writing lesson will be delivered in a senior one class with 68 students who are beginning to be exposed to argumentative writing. Teaching in Chongqing's general public high schools is still test-orientated, but it is also combined with teaching materials to help students make long-term plans. For example, argumentative essay writing not only trains logical thinking, but also lays the foundation for academic writing in higher education. The class participating in the research has a moderate English foundation, no international education background, and uses an English textbook of the People's Education edition, all of which, to a certain extent, have made the class a representative of China's test-oriented education.

3.2 Research designs

In response to the research questions, the overall research design consisted of three main parts: teaching, teaching and learning analysis, and reflection on improvement.

3.2.1 Pre-class preparations

The teacher designs the overall process of teaching and learning based on the level of students in the class before the lesson, and uses teaching tools and conceives classroom activities according to the theory of multimodal metaphors. Theoretically, the teacher should try to ensure that the stated instructional objectives are accomplished within the 40-minute class, which will be reflected in the assignments that follow.

3.2.2 While-class teaching

This English argumentative writing class is mainly based on task-based language teaching method, supplemented by contextual teaching method. The teaching tools used by the teacher in the classroom are traditional teaching tools, such as textbooks, lesson plans, handouts, blackboards, and chalks; multimedia equipment such as computers, projectors, and slides; in addition to small gifts to reward students. Classroom activities include picture presentations, watching videos, explaining knowledge points, situational interactions, class discussions, and student reports. The teacher should not only impart relevant knowledge but also develop the qualities of the students according to the teaching objectives.

3.2.3 Post-class activities

The teacher collects and marks assignments and analyses outputs. Reflection on teaching and learning from both quantitative data and qualitative research data is undertaken with a view to adapting the design of teaching and learning in a more focused way in the future.

3.3 Data collection

3.3.1 Data on teacher's teaching

A semi-structured interview will be conducted with the teacher after the class, focusing on four main points: how to design in-class activities using multimodal teaching and learning tools; considerations in the design process; difficulties encountered in the real teaching and their solutions; multimedia skills training for teachers; inspirations for improving teaching and learning in the future.

3.3.2 Data on students' performance

Data from students' perspectives will be collected in the form of posters (with argumentative essays on them and other designs), mind maps, questionnaires, and handouts. Besides, students' in-class performance can be studied through classroom observation method as the class will be recorded by camera.

Factors to be considered in students' posters are: whether or not multimodality was used for presentation; the number of modalities; the score of the argumentative essay; the number of students who have used metaphors in their essays; and the overall score of the poster. While the argumentative essays can reflect students' learning from classes and English language proficiency, the poster designs reflect the extent to which students are creative in their use of multimodality. Mind maps can help teachers understand students' thinking processes in order to find possible problems. The above data will be analyzed using Excel to count individual items and display the distribution of students' scores.

As to the extent to which the multimodal metaphor in classroom activities actually affects students, it can be analyzed from classroom observations and can also be known from students' questionnaires. Questionnaires are complementary to quantitative analyses. Due to the large class sizes, it was more efficient to submit one questionnaire per person to get more complete information rather than sampling for semi-structured interviews. The questionnaire will provide a more in-depth study of the students, such as whether they have a background in drawing and painting studies, how often they use computers each week, and how they feel about the experience of the multimodal classroom.

3.4 Data analysis

3.4.1 Analyzing the teacher's interview and teaching material

For analyzing the teacher's interview and teaching material, the teacher's interview is transcribed and then compared with teaching materials, making a qualitative analysis. The transcription was read through to identify keywords that emerged from the discussion. This focuses on class activities, teaching tools, teaching process and challenges faced, and inspirations. After analyzing the interview data, a comparison of the information collected with the teacher's teaching materials, such as instructional resources, handouts, assessments, and so on, was conducted. Such analysis can identify the connections between what the teacher says in the interview and how they actually implement these ideas in their teaching.

3.4.2 Analyzing students' argumentative essays presented in poster form

As for the argumentative essay itself, according to the score of the argumentative essay, the research analyzes how well students organize their arguments, including the logical flow of ideas, the use of evidence to support claims, and the coherence of the argumentative structure.

As for the form of the argumentative essay, according to the number of modalities and their usage, the research evaluates how well students integrate textual content (arguments, claims, evidence) with visual elements (images, symbols, graphics) in their posters, and analyze whether the visual elements enhance the message of the text and contribute to the overall argument. Besides, regarding the number of metaphors and their usage, how effectively students employ metaphors in both textual and visual elements to convey complex ideas evoke emotions, or make persuasive arguments, is assessed, and the creativity and relevance of the metaphors used are evaluated.

3.4.3 Analyzing class observation and questionnaire

The class observation and questionnaire are also discussed to complement students' learning and cognitive processes.

As for classroom observation, it is an important tool for teachers to assess teaching effectiveness, student engagement, and overall classroom environment. The research mainly focuses on the reaction of students in class, assessing how engaged students are in the class, including their participation in answering questions, level of interest, and overall attentiveness. It can also be inferred whether the application of multimodal metaphor in class can influence students' learning cognition and reception of students' in-class performance.

As for the questionnaire, the design ability and other background information of students as well as their feelings about the multimodal class are investigated. The first step in analyzing a questionnaire is to clean the data. This involves checking for missing or incomplete responses, inconsistencies, and errors in the data collected. For closed-ended

questions with predetermined response options, quantitative analysis can be conducted. This involves calculating percentages, averages, and other statistical measures to summarize the data and identify patterns. For open-ended questions that allow participants to provide detailed responses, qualitative analysis is conducted. This involves categorizing responses to identify common themes, opinions, and perspectives shared by participants.

4 Results

The analysis of the teacher's interview will be presented first, with a clear framework of this multimodal classroom construct. Students' work and other supplementary data will then give a picture of the effectiveness of the lesson and the quality of the output throughout the lesson.

4.1 Interview data

The teacher was asked six questions, summarised in the following key points.

The multimodal classroom requires more time and effort from the teacher to prepare than traditional teaching methods (e.g., simply using the blackboard and textbook with no multimedia equipment), but the teacher believes that the preparation is worthwhile. The training provided by the school to teachers in the use of multimedia teaching tools has also made lesson planning much more efficient and enriched the use of various modalities.

In guiding students to think about the topic of writing, the teacher uses pictures, audio, and tables, modalities that capture students' attention and lead naturally to the following content. However, the teacher mentions that the proportion and frequency of using these elements need to be carefully measured, otherwise students' attention will be diverted.

For classroom teaching, the specific modality may have to be modified according to students' different levels of English proficiency. For example, for this class with a medium level, most part of the video is Chinese audio with bilingual subtitles, and for a class with a higher level, the teacher can consider using all-English audio.

4.2 Students' posters and mindmaps data

There are 63 students in this class and 48 valid assignments marked by the same teacher. For the writing of argumentative essays, they are measured by writing purposes, text structure, and argumentation according to the new English Curriculum Standard of General Senior High School in China (2017 version) [22]. The distribution of scores is shown below, with the largest number of people in the 60 to 89 score band. In terms of the content of the writing, 39.58 per cent of argumentative essays are well structured according to the criteria of three parts: introduction, body, and conclusion; 41.67 per cent of students can use logical connectives appropriately; 16.67 per cent of students use metaphors, as well as 6.25 per cent of students use similes. As for the design of posters, most of the students use only hand drawing while 12.50 per cent use computer to design, and even 10.42 per cent use both (see Figure 1).

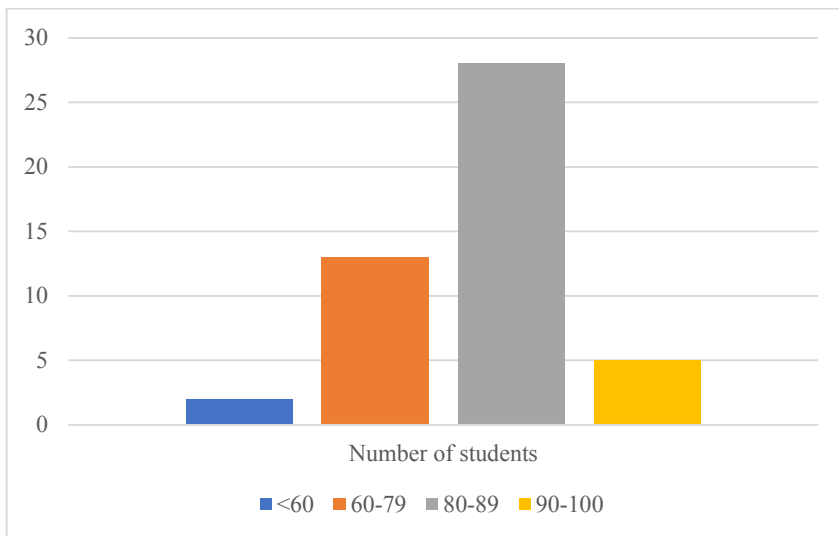


Fig. 1. Distribution of Scores of Students' Argumentative Essays.

The main problems with argumentative writing are incomplete structure, inappropriate examples, and a great number of grammatical errors; the problems with the overall design of the poster lie in the poor fit with the content of the essay, monotonous and unattractive colors, and scribbled handwriting.

Mindmaps as an embodiment of the visualization of students' essays have presented the result that the higher the scores on the argumentative essays are, the more detailed and logical the mindmaps are.

4.3 Classroom observation and questionnaires data

A noticeable phenomenon has been found in classroom observation. Compared with watching pictures and videos on the screen, the fact that the representative of the group discussion speakers is rewarded with stickers by the teacher brings the students' emotions to a climax in the classroom. Another phenomenon is that when the teacher writes on the blackboard students can always pay attention and consciously take notes, while the content on the PowerPoint which has already been done is not likely to make them have the desire to take notes, and even need to be specially reminded by the teacher.

Table 1. The most impressive modality.

The most impressive modality	
Text	14.58%
Image	66.67%
Audio	31.25%
Gestures	2.08%
Others	0%

Table 2. Students’ preference for posters.

Do you like making posters as a way of presenting assignments?		Students who have painting learning experiences (out of corresponding part)	Learning duration
Yes	79.17%	28.95%	3 months-12 years
No	20.83%	40%	1 month-6 years
I don’t know	0%	0%	0

For valid assignments, 48 questionnaires are distributed, all of which are returned and valid. When exploring which modality impresses students most, among text, audio, image, gestures, and others, image (or moving images) is the most mentioned one. The second most popular is audio, about half of the image. Besides “others”, the least mentioned are gestures and text, although two students specifically mention that blackboard-writing and stickers have impressed them (see Table 1).

About their preference and painting experience, 79.17 per cent of the students prefer posters as a form of writing assignment, of which only less than one third has learned painting with professional teachers or institutions after class for a period of time ranging from 3 months to 12 years (see Table 2). For computer use, senior high school students only use computers once to 3 times a week. For the students, the most difficult aspects of argumentative writing are grammar and vocabulary, and they cannot use metaphors proficiently, but 91.67 per cent still find metaphors useful.

Students also mentioned a lot of creative ideas for the form of English writing assignments, such as playlet performances, video blog production, modelling (combined with text), and the combination of social practice and writing.

5 Discussion

The discussion focuses on the results of the research, explores the application of multimodal metaphors in the work of teachers and students, and further responses to the research questions.

5.1 The application of multimodal metaphors in teacher’s teaching

From the teacher’s interview data, the teachers leverage multimedia tools like images, videos, audio clips, and interactive presentations to provide various sensory modalities like visual, auditory, and tactile, creating a rich and immersive learning environment based on the teaching content. The large exposure to multimodal materials aims to cultivate students’ conceptual metaphorical thinking. As for visual metaphor, while reading the text, it displays relevant images and diagrams to illustrate key concepts. For instance, when discussing the challenges of space travel, show an image of an astronaut floating in zero gravity, accompanied by a caption, “The vastness of space and its challenges are as endless as the astronaut’s journey.” This visual metaphor helps students visualize the abstract concept of space exploration’s difficulties. Besides, the teacher shows tables of “Financial Costs in Space Exploration” to establish the concept of the cost in students’ minds. As for audio metaphor, play audio clips “Why do we explore outer space” from CCTV NEWS, highlighting people’s personal experiences and perspectives. The use of authentic voices adds emotional depth and credibility to the lesson.

From classroom observation, it is worth noticing that students listen more carefully and take notes when the teacher writes key elements on the blackboard and uses body language to reinforce them. For instance, when analyzing how to organize the argumentative essay and how to support the thesis statement in the essay, the teacher writes the structure chart and writing techniques with chalks and gesticulates them. This physical behavior helps students connect with the theoretical and abstract concepts of argumentation on a more concrete and clear level.

From teacher's interviews and questionnaires data, multimodal approaches to teaching writing can significantly engage students and capture their attention. Images, particularly moving ones, are the most popular modality among students, followed closely by audio. This suggests that visual and auditory stimuli are highly effective in engaging learners, especially in language classrooms where traditional text-based methods can sometimes seem monotonous. However, overuse or misuse of these tools can potentially distract students from the core learning objectives, highlighting the need for a balanced and strategic approach. Therefore, tailoring materials to suit the needs and abilities of individual students ensures that everyone can benefit from the multimodal experience, enhancing their cognitive ability and cultivating critical and metaphorical thinking.

5.2 The application of multimodal metaphors in students' writing in the form of posters

The large exposure to multimodal materials aims to cultivate students' conceptual metaphorical thinking, which can be observed in their mindmaps and after-class writing in the form of posters.

From the scores of students' essays, more than half of the students got over 80 scores, which implies that most students have the command to write argumentative essays with complete structure, proper logic, and clear arguments. According to the results, those who make full use of mindmaps to visualize their logical thinking have higher scores, the advantage of making mindmaps is verified.

In students' posters, a large number of students use color drawing to help argumentative expression. Students incorporate visual imagery into their writing by describing scenes or objects that symbolize or represent abstract concepts. For instance, they use different shades of blue as the main hue, representing the vastness of space, together with the figures of astronauts, spaceships, and planets, to reflect their cognition of the universe.

As for metaphorical language, students become aware of the use of metaphors in their writings to make their sub-arguments more vivid and persuasive. They might compare a complex issue to a more familiar scenario, making it easier for readers to grasp the essence of their argument. The following examples are several metaphors written by students in their essays. These metaphors are also supplied with corresponding modalities, such as pictures, to visualize their thoughts and emphasize the significance of human achievements in space.

Example 1: Exploring space is a dance in the dark, dangerous but beautiful.

Example 2: The flowers of space exploration will bloom with the prosperity of the motherland.

Example 3: In summary, space exploration is a paramount key to unlocking the field of technology.

Example 4: Even though space exploration can have bad effects by touching rocks, we can choose to break rocks and change them.

From the questionnaire, although most of the students have not learned painting professionally, they try their best to integrate drawing into writing and prefer doing the writing assignment in the poster. Some of them also turn to multimedia for help, using the computer to design the poster, so that they can skillfully apply multimodal metaphors to

poster making. Additionally, it is gratifying that almost all the students consider that using metaphors in writing is useful. They demonstrate their understanding of multimodal metaphors and apply this knowledge to their own writing.

However, there still exists much room for improvement. The application of multimodal metaphors is limited, due to the small proportion of students employing metaphors in writing and the unavailable skills of using technology and diverse media. This suggests a need to continually encourage students to explore the power of metaphor together with diverse multimodal tools for persuasive communication. Besides, students are supposed to focus on foundational writing skills, such as grammar, structure, and writing language, while simultaneously introducing advanced rhetorical strategies.

6 Conclusion

By collecting teaching and learning data from an argumentative essay writing class in a public high school in Chongqing, this study aims to analyze how teachers and students apply multimodalities and metaphors to their respective tasks. This study found evidence that appropriate use of multimodal metaphors indeed leads to better mastery of basic writing skills and has a positive impact on students' level of classroom engagement and motivation to complete assignments. After the teacher's careful design, students are able to think about the writing topic under the influence of audio, image, and gesture, and improve their note-taking based on the teacher's vivid blackboard-writing design. In poster making, students have combined drawings about space with their own argumentative essays, giving full play to their imagination and allowing their ideas to be presented in a more graphic and metaphorical way than traditionally writing in exercise books. Some students are even inspired by this and suggest that teachers should diversify the forms of assignments in the future by incorporating more modalities, such as modelling or video production. Teachers can listen to students' ideas to an appropriate degree as outcomes as well as feedback can in turn guide teachers' class design.

The limitations of this study are the small-scale sample and limited external validity, thus not allowing for broad conclusions to be drawn. However, as much and detailed as possible, all the data available have been analyzed, and it is hoped that this lesson example will provide future researchers with limited inspiration when exploring a wider range of high school English argumentative writing lessons with multimodal metaphors.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

References

1. G. Lakoff, *The contemporary theory of metaphor* (Cambridge University Press, 1993)
2. G. Lakoff & M. Johnson, *The metaphorical structure of the human conceptual system*. *Cogn. Sci.* **4**, 195-208 (1980)
3. C. Forceville, *Visual and multimodal metaphor in advertising: Cultural perspectives*. *Styles Commun.* **9** (2017)
4. G. Lakoff & M. Johnson, *Metaphors we live by*, (University of Chicago Press, 2008)
5. G. Kress, *Multimodality: A social semiotic approach to contemporary communication*, (Routledge, 2009)

6. M.S. McGlone, What is the explanatory value of a conceptual metaphor? *Lang. Commun.* **27**, 109-126 (2007)
7. C. Forceville, Pictorial and multimodal metaphor in commercials, in *Go figure! New directions in advertising rhetoric*, 184-210, (Routledge, 2014)
8. C. Forceville, Pictorial and multimodal metaphor, in *Handbuch Sprache im multimodalen Kontext*, 241 (2016)
9. E.R. Hamilton, Picture this: Multimodal representations of prospective teachers' metaphors about teachers and teaching. *Teach. Teach. Educ.* **55**, 33-44 (2016)
10. X. Deng & X. Wu, Exploring the role of multimodal metaphor through gestures in middle school English education. *J. Contemp. Lang. Res.* **3**, 1-9 (2024)
11. Y. Liu, Research on the construction of multimodal metaphor in smart classroom of college English in sports colleges. *J. Hubei Open Vocat. Coll.* **36**, 166-168 (2023)
12. Y. Dong, Multimodalization of English metaphor ability cultivation in internet education environment. *Educ. Theory Pract.* **40**, 54-56 (2020)
13. W. Zhang et al., An empirical study of multimodal metaphor in college English vocabulary teaching. *Mod. Educ. Technol.* **24**, 63-70 (2014)
14. X. Huang, Application of multimodal metaphor in high school English vocabulary teaching. Master's Thesis, Zhejiang Normal University (2017)
15. S. Chen, An empirical study on multimodal metaphor teaching of college English vocabulary in new media context. *J. Heilongjiang Inst. Technol.* **18**, 108-111 (2018)
16. X. Wang & P. Zheng, Research on the application of multimodal text in college English reading teaching. *J. Shanghai Polytech. Univ.* **36**, 223-228 (2019)
17. J. Zhu, College English foreign newspaper reading teaching from a multimodal perspective. *Engl. Square (Acad. Res.)* **3**, 71-73 (2022)
18. W. Li, Research on the application of multimodal metaphor in high school English reading teaching. Master's Thesis, Minnan Normal University (2023)
19. Q. Yu, Research on the application of multimodal metaphor theory in high school English vocabulary teaching. Master's Thesis, Harbin Normal University (2023)
20. J. Wu, An empirical study of multimodal metaphor in college English writing teaching. *J. Jiangxi Norm. Univ. (Philos. Soc. Sci. Ed.)* **50**, 134-139 (2017)
21. W. Feng & B. Mi, Application of multimodal metaphor in college English picture writing teaching. *J. Qiqihar Norm. High. Vocat. Coll.* **1**, 140-142 (2021)
22. Ministry of Education of the People's Republic of China, English curriculum standards for senior high schools (2017 Edition) (2017)