Image, Symbol, and Philosophy: Meaning Construction and Semiotic Analysis in Graphic Design

Yuan Huang *
University of East Asia, Yamaguchi Shimonoseki 7518503，Japan
huangyuanlaoshi@sina.com

Chang Wang
University of East Asia, Yamaguchi Shimonoseki 7518503，Japan

Abstract: The justifications for design are different from those for art. Design education can be facilitated by establishing a solid theoretical foundation through scientific design processes. To determine whether the semiotic theories advanced by Saussure and Peirce may be used in poster design, we looked at graphic design curricula from these perspectives. Thirty students were divided using the matched groups design technique into a control group and an experimental group for the teaching experiment. The trial's findings showed that by incorporating semiotic theories into their designs, the experimental group's students outperformed the control group's students in terms of typography, image inventiveness, and total poster design score. The experimental group submitted four student-made posters to the 4th Block of the International Triennial of Ecological Posters, and four of those posters were chosen. The training experiment's findings show that introducing semiotic theories to students in graphic design classes improves their ability to perceive things, fosters the development of their poster-designing abilities, and intensifies the posters' visual tension.
Keywords: Poster Design, Teaching, Semiotic Theories, Graphic Design Instruction

1. INTRODUCTION

The meaning-making processes of science employ a variety of multimodal representational forms, including spoken and written words, diagrams, equations, graphs, and images. The process of purposefully developing and communicating meaning through visual elements including pictures, symbols, colors, typography, and layout is known as meaning creation in graphic design. Because of our ever-improving understanding of various ways of making meaning, science learning develops. Students' use of representations to explain science and their interactions with those representations are two key trends in socio-culturally focused research on student learning utilizing representations (Knain et al., 2021). Social semiotic theory, which regards spoken language as only one of many potential meaning-making strategies, has gained prominence during the past 20 years. To convey particular concepts, ideas, emotions, or facts to

their target audience, designers use a variety of graphic elements. In this technique, design decisions are purposefully made to elicit particular responses or perceptions from viewers. It acknowledges that each design component works in concert to enhance the overall impact and message of a graphic design project. Although multimodal techniques for meaning analysis are already common in some domains, such as argumentation studies, they are frequently underused in studies of language and interaction because linguists have historically placed a greater emphasis on discursive processes (Arnold-Murray, 2021). The research asserts that iconic structures have the most symbolic value. Investigating this association is another goal of the research and analysis done. It's crucial to stress that the phrase iconic buildings in the report refers to structures that the Bilbao effect has had an impact on. Iconic buildings are distinctive and one-of-a-kind structures that have a strong gestalt and figural shape and stand out from the surrounding urban environment (Duan, 2023).

Their shapes are strange metaphors in geometry (Uluğ, 2022). In this digital age, communication modes and mediums evolve, and new languages appear. One of the most contemporary means through which people express their opinions and beliefs is through political cartoons. Political cartoons are described in the curriculum guide as images that appear in newspapers all over the world, are often thought-provoking, and seek to teach the reader about a current issue and understanding of the world of political cartoons (Imperial, 2020). In graphic design, semiotic analysis entails systematically examining signs, symbols, and visual components to determine how they convey meaning. Graphic designers can more efficiently decode and encode messages with the aid of semiotics, which is the study of signs, symbols, and how they carry meaning. The teaching and learning of culture are closely tied to language education in today's society, which is characterized by globalization and intercultural contact. As a result of their importance as a source of input into the target language and cultural information in the teaching of second languages, textbooks have developed into a vital tool for promoting cultural values, propagating attitudes, and even encouraging prejudices or misunderstandings (Xiong & Peng, 2021).

Semiotics is a method for examining sign meaning, making it an intriguing way to examine sign systems like architecture. As a subfield of semiotics for visual communication, semiotics of architecture has developed, enabling the interpretation of a structure as a sign and the user as a receiver (Schielke, 2019). Digital tools are being used in language learning more and more frequently. In both official and informal settings, it has changed how languages are taught and learned. Language acquisition

is no longer confined to a specific location or period of time. Language learners from varied cultural, linguistic, and socioeconomic backgrounds can now study a language whenever and wherever they wish (Ho, 2019). Globalization has had a significant impact on cultural customs, and the rapid advancement of information technology has had a significant impact on the maintenance of cultural identity. The fundamental aspects of the visual culture in China are traditional Chinese symbols and patterns, which were developed over the course of 5,000 years of Chinese history (Hu et al., 2019). Architecture, which is a system of man-made items placed in space to shield a person from the elements, acts as a medium for preserving cultural history and the philosophical underpinnings of existence in addition to being an expression of human needs (Bulakh et al., 2022). Cities are made up of people, space, and culture, and they change in appearance as their inhabitants do. A city's impression is a reflection of its residents' lifestyles and natural urban consciousness (Hsun & Jie, 2022).

The study (Celhay et al., 2020) asserts that motivated signs in graphic designs are preferable to arbitrary ones because they increase the likelihood that items will be understood by consumers from diverse cultural backgrounds. Eight imported wine labels were examined using a semiotic analysis in order to test this hypothesis. The study (Weber & Rall, 2022) offered a three-level analytical framework that includes levels for modes, context, and discourse. The approach helps to systematically examine how visual communication in periodical cultures is evolving. The study (Nuban, 2023) seeks to examine the creative approaches utilized in advertising, the visual meanings concealed within them, as well as the linguistic patterns used in Energen advertisements on social media and television. The study (Weber, 2019) was to establish a connection between the aesthetic form and its social significance in a particular setting. The framework improves understanding of how semiotic components affect the meaning of data visualization. The research (Chen & Cheung, 2022) provided a framework for the investigation of e-commerce advertising that combined social semiotics, multimodal analysis, and interactivity.

They claim that in addition to using standard marketing techniques, as part of a business-led initiative to develop new cultural forms that encourage purchasing, enlarged and disguised the rebellious concept of carnival. The approach centers on Ferdinand de Saussure's semiotic analysis, which investigates the relationship between the signifiers and signified in the advertisement. The study (Widnyana, 2023) is to thoroughly characterize the messages, connections, and meanings connected to the signifiers and signified used in advertising. ABC's SAMBAL presents Tim

Padiasios. The study (Shukla et al., 2022) will assist FMCG companies in understanding how to employ container semiotics to improve consumer brand experience and influence purchase intent.

The results (Suhaimi et al., 2019) showed that readers could unquestionably be persuaded to buy the religious book that was already available by the efficient use of visuals. This study was also expected to produce a rich cultural society, increase Malaysia's book publishing rate, and advance the nation's socio-economic interests. The results (Schifferstein et al., 2022) imply that consumers can manage various packaging signals, but determining the best arrangement is still a design difficulty. The study (Wu & Cheong, 2021) illustrated how names and logos of Chinese companies are typographically and cleverly created as arresting visual components and semiotic resources with potential importance, expressing their brand identities.

1.2 Key Contribution

➢ The participants were then divided into Group A or Group B, each with 15 students, using the matched groups design technique.

➢ The Pre-test was given to the students, and the outcomes were tabulated from highest to lowest.

➢ The judges graded the post-test posters based on the four grade criteria from the pre-test.

➢ The results demonstrate the variance in the overall ratings for each of the four categories between the experimental group and the control group.

The rest of the paper is as follows: The experimental methodology is thoroughly detailed in Part 2. The results and discussion is covered in Parts 3 and 4, and the conclusion is covered in Part 5.

2. RESEARCH STRATEGY

This section covers Image, Symbol, and Philosophy: Semiotic Analysis in Graphic Design and Meaning Construction.

2.1 Experimental Methodology

The design of the poster was decided upon after a four-week training course with the theme of public welfare. Fifty-four students created a public welfare poster individually at the start of the course. In a statistical method that ranked the results sequentially, the poster grades were utilized

as the pretest score. Thirty pupils were selected as the final test subjects from both sides of the datum point, which represented the median of the outcomes. In accordance with the matched groups design technique, the participants were then split into Group B or Group A, each with 15 students. Groups A and B (the control group) were given schedules for graphic design classes that included semiotic theory courses and those that did not. Figure 1 depicts the preparatory, primary creative, and production phases of graphic design.
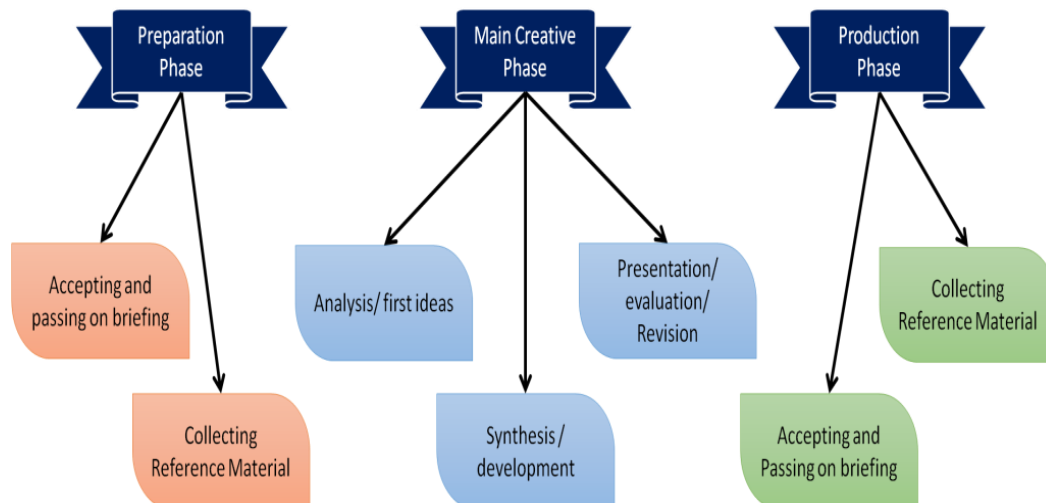

Figure 1: The three steps for graphic design training

2.2 System Design

For a total of four weeks, both the experimental and control groups of individuals took part in educational activities. A lecturer gave the students content for the first ninety minutes of the weekly three-hour session; the remaining time was spent on practical practice. Thus, throughout the course of the four weeks, the students were trained for a total of 720 hours. In addition, the teacher gave each student a public welfare theme to choose from in accordance with the course material. The students were required to create three concepts for poster designs on the topics they had chosen, and then they had to choose one of those concepts to use as the basis for their final poster design.

For both groups, the first week of classes was the same. Students in the control group were first exposed to the case teaching method in the second week, but no course materials pertaining to semiotic theory were given. Students in the experimental group, on the other hand, were taught how to create posters that combined elements of images and signs and got supplementary course materials on semiotic theories. Figure 2 provides a full breakdown of the instructional experimentation process.
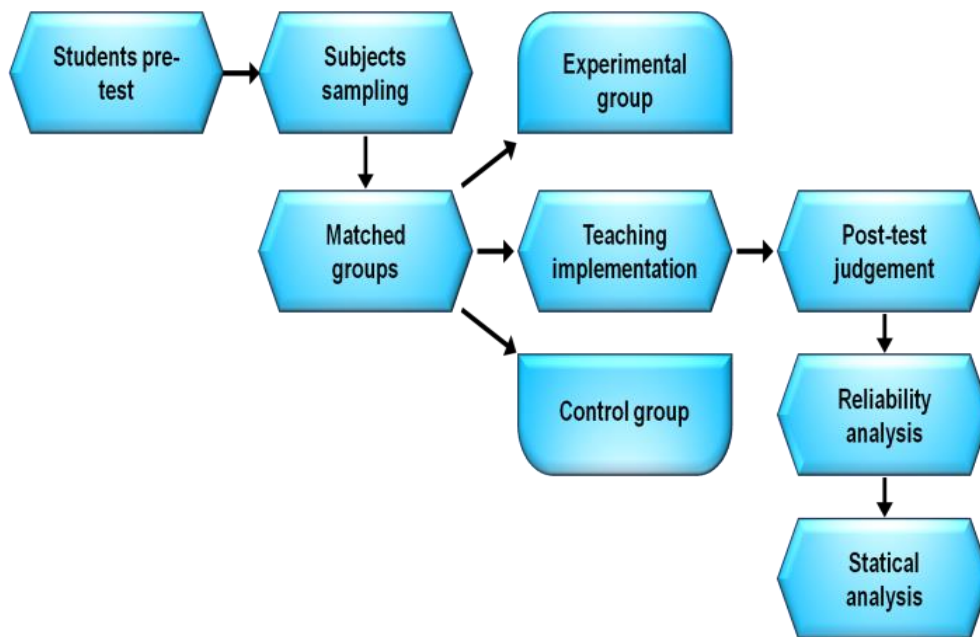
Figure 2: A flowchart for an experiment in education

2.3 Group matching and the pretest

A purposive sample technique was used to select first-year students from the Department of Visual Communication Design who were between the ages of 18 and 19. Each of the 54 first-year students enrolled in the graphic design program individually produced an A4-sized poster on the topic of global warming before the formal experiment was carried out. The required poster content comprised features including images, a headline, and body text.

Additionally, each poster had to be accompanied by a report of no more than 100 words that described the design concept. The pretest lasted for three hours.

Following the creation of the posters, two teachers who had previously taught graphic design courses served as judges and assigned grades based on the posters' image inventiveness, picture aesthetics, color application, and typography. 25% of the final score came from each of the criteria. The scores for each category were summed up to create the overall pretest score, and the assessments from the two judges were then averaged.

We looked at the judges' scores after the pretest posters had been rated. The judges reassessed a poster where the gap in the scores was less than 10 points. The poster was taken out of the trial while the difference between the reevaluated scores was still 10 points. Five of the 54 pretest posters were removed because their ratings varied by 10 points or more. As a result, 49 posters in total were used in the experiment that followed.

The results demonstrated that the two judges' scores were equivalent,

with the Spearman's value being 0.714 ($p < 0.05$). Thus, 30 students in total were selected to participate in the educational experiment. The pupils' P-test results were listed in order of highest to lowest. Following that, using the matched groups design method, the students were split into 15-student groups, Group A or Group B.

The two student groups received a variety of training, as illustrated in Table 1. The findings showed that Group A's and Group B's average pretest scores (81.13 and 5.09 points vs. 80.63 and 6.52 points, respectively) did not differ significantly, demonstrating that the students' poster-designing skills were comparable before they participated in the experimental curriculum. S denotes subjects.

Table 1: The experimental subjects are grouped

Group	Score hierarchy
A	S1
B	S2
B	S3
A	S4
A	S5
B	S6
B	S7
A	S8
... ...	... ...
A	S28
A	S29
B	S30

2.4 Respects for the Judges

The two pretest judges took part in the post-test assessment, which was done following the completion of the 4-week program. The post-test posters were scored by the judges using the four grade criteria from the pretest. The post-test results were computed using the average scores from each judge after the scores for each criterion were added. After that, the post-test results were examined using Spearman's rank correlation coefficient analysis.

These findings were supported by Spearman's values of 1.02, 0.634, 0.876, and 0.734, respectively; for image originality, the reliability coefficients for the four grading categories were greater than the $p < 0.05$ significant criterion, picture aesthetic, and typography.

Additionally, the total score's Spearman's value was 0.987, demonstrating consistency between the judges' post-test results. In other words, the statistics supported the results of the posters the students produced for the

course. The differences between the two groups were therefore investigated through additional analysis.

3. RESULTS

The average scores for the experimental group in the categories of image creativity, color application, typography, picture aesthetic and overall were 23.57, 22.81, 21.41, 22.05, and 89.84 points, respectively. The control group received average scores of 22.49, 21.89, 21.98, 21.59, and 87.16 points in the categories of image inventiveness, color application, picture aesthetic, typography, and overall.

These findings show the difference between the experimental group and the control group's total ratings for each of the four categories. Table 2 displays the results and standard deviation (SD) for the experimental and control groups. The deviation from the mean for the experimental and control groups is depicted in Figure 3.

Table 2: Standard Deviation for Experimental and Control Group

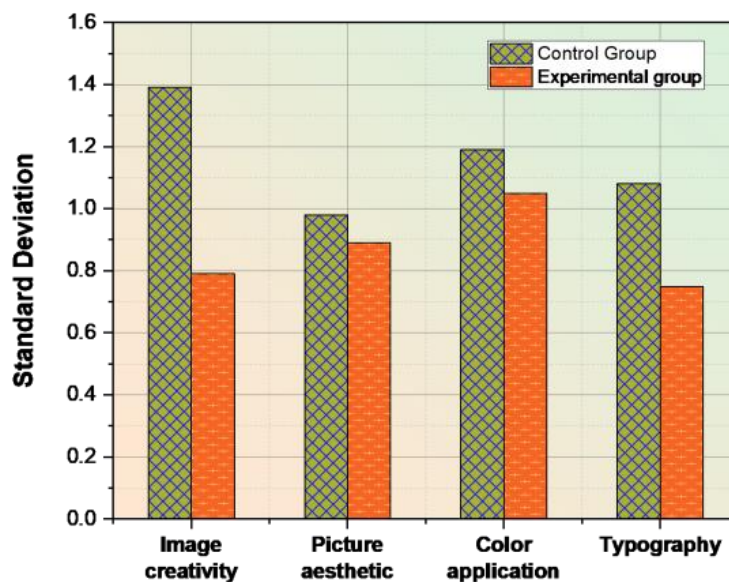| Parameters	Standard Deviation (SD)	
	Control Group	Experimental group
Image creativity	1.39	0.79
Picture aesthetic	0.98	0.89
Color application	1.19	1.05
Typography	1.08	0.75

Figure 3: Deviation from the Mean for the Experimental and Control Groups

Table 3 displays the mean for the experimental and control groups. The average for the experimental and control groups is depicted in Figure 4.

Table 3: Mean for Experimental and Control Group

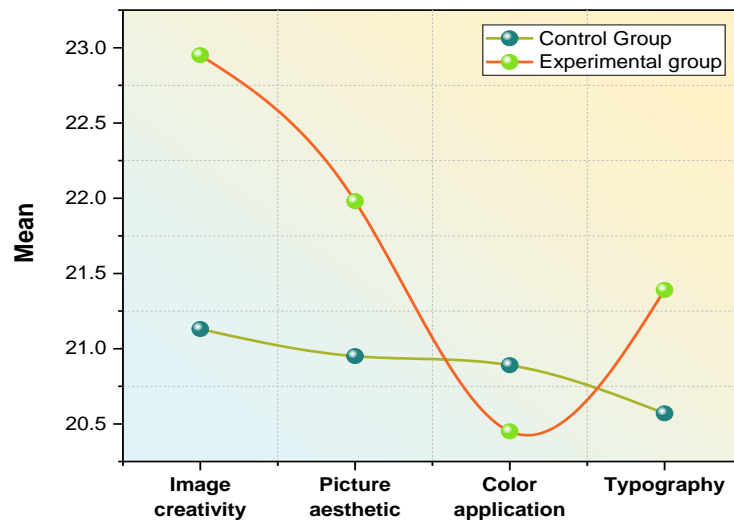| Parameters	Mean	
	Control Group	Experimental group
Image creativity	21.13	22.95
Picture aesthetic	20.95	21.98
Color application	20.89	20.45
Typography	20.57	21.39

Figure 4: Average for the Experimental and Control Groups

The differences between the 4 criterion scores and the overall scores shown in Table 4 were assessed using Analysis of Variance (ANOVA). Where MS stands for Mean Square, df for Degrees of Freedom, SS for Sum of Squares, and F for Test Statistic.

Table 4: Results of the one-way ANOVA for the experimental and control groups

	Groups	df	F	MS	Sig.	SS
Image creativity	Between Groups	2	18.10	22.84	.001***	22.84
	Within Groups	29	-	1.23	-	36.14
Picture aesthetic	Between Groups	2	8.81	7.52	.007**	7.52
	Within Groups	29	-	.86	-	24.88
Color application	Between Groups	2	.989	1.22	.330	1.22
	Within Groups	29	-	1.23	-	35.02
Typography	Between Groups	4.82	2	4.82	5.85	.024*
	Within Groups	24.08	29	.83		
Total score	Between Groups	109.31	2	109.31	4.13	.008**
	Within Groups	363.68	29	13.96		

Images, typography, and overall design received higher aesthetic ratings from the experimental group on average than they did from the control

group. The average color application score between the experiment group and the control group, however, showed no statistically significant difference $(F(1, 28) = 0.99; p = 0.326)$. The results revealed that the experimental group's picture originality score was significantly greater than the control groups.

4. DISCUSSION

4.1 Use of Image and Signage in Poster Design Performance

The training experiment proved that teaching graphic design students using semiotic theories improved their poster-making skills. When compared to other aspects of creating, the improvement in visual originality was particularly evident. To put it another way, including semiotic course material in graphic design courses may inspire students to come up with more inventive poster designs. We claim that poster graphic artists can use pictures and symbols to decide which visual components to use based on the design imagery. Depending on their own cultural background and experiences, viewers may interpret the posters' visual and semantic messages. Such a process might increase the poster designers' inventiveness and the joy poster viewers get from them by allowing viewers and designers to connect and communicate through the posters.

The word SPREAD is shown on a red alert background, with dandelion seeds drifting from the top left corner to the bottom right. Overall, this billboard pokes fun at how terror brought on by conflict has crept over the globe. Additionally, the poster's wholeness allows the viewer to be led as they consider the ultimate meaning of peace. The incorporation of semiotic theories into poster design curricula has typically made it possible to guide students in considering connections between signs in order to improve the originality, aesthetics, and the poster designs' visual impact, as well as the arrangement and use of the headlines on the posters.

4.2 Images and Symbols Supporting Poster Designers' Logical Thought

Graphic design has a subfield called poster design that uses visual marks as a medium to communicate ideas. Designers may produce posters that communicate with the general audience and convey information by incorporating relevant visuals. Graphic designers must use visual components, such as texts, photos, pictures, colors, and textures, in their work in order for posters to serve as a vehicle for communication and demonstration.

Graphic designs are frequently displayed on posters. Designing images is thought of as an expressive form of visual communication because they may be used to represent objects. An image that is rich in connotative information allows viewers to connect their imaginations to the image's content, which is effectively and immediately communicated to them. Images that provide visual information can also fill in the information gaps created by verbal and aural communication. Images are, therefore, an essential component of poster design, and by using semiotic theories, the poster's visual tension can be improved.

Encoding and decoding visual images are steps in the poster creation process. The designer must make an effort to prevent the viewer from misinterpreting the intended message while encoding an image. As a result, we suggest the following three methods for addressing this issue: (A) The associative method: Image signs can be created using common experiences or cultural contexts. (b) A primitive strategy: Depending on the poster's intended message, a highly mentalized image is chosen. (c) Cognitive approach: The poster designer takes into account how people think to develop a visual concept that corresponds with the viewers' mental images.

These three strategies can be combined to create a framework for poster design that embraces the concepts of sign characteristics put forward by Peirce and Saussure, as well as their ideas of arbitrary and associative relations. A designer can utilize the image of bones to represent death while making a poster about a subject relating to the environment, like the high coral mortality brought on by ocean pollution. The separate photos of coral and bones can then be blended to produce a visual representation of the issue of coral bleaching. The satirical title of the poster, "White Coral," can now be used.

4.3 Semiotics' Relevance for Graphic Design Education

According to Saussure's theories of signs, the signifier and signified can be freely combined to reflect a sign's connotation. Due to the relationship between these two things, the sign's meaning might be gradually uncovered through day-to-day interactions. Peirce further argued that signs include phenomena, images, and any significant item in addition to the aspect of languages. Additionally, signs are constantly around us as we go about our daily lives, and we actually live in a world of signs. Consequently, it is possible to think of images as the visual language of graphic design. Graphic designers are able to communicate ideas by creating and rearranging visuals. Images can also be used to represent design principles by being defined by cultural traditions, augmented with words and colors,

and then reintegrated. To make their works more profound, graphic design students should get familiar with semiotic ideas. Graphic design must, among other things, capture viewers' attention, facilitate understanding, and, most importantly, resonate with them in order to accomplish the purpose of information exchange.

An integrated science, graphic design draws from cognitive psychology, philosophy, sociology, and elements of visual art. However, designers have struggled with how to pique viewers' curiosity and sense of novelty without sacrificing a graphic design's ability to communicate. Incorporating semiotic theories into graphic design instruction may increase students' works' relevance and originality as well as their viewers' resonance and the goal of information and emotional interaction, according to the research's teaching experiment.

However, none of the control group's posters were picked, demonstrating that understanding semiotic theories in graphic design classes can help students become better poster makers. Children can improve their observational abilities by considering the importance of pictures and signs.

5. CONCLUSION

Design education, especially graphic design, now includes semiotics as a core subject to the scientific design process. Semiotics has been emphasized in design education after decades of development as one of the primary theories and approaches utilized in designing. The subject of semiotics has been covered in several research and books. We conducted a teaching experiment, in contrast to earlier studies, to confirm the semiotic theories' application to the teaching of poster design. The findings showed that students' creativity, observational skills, and imagination richness all increased as a result of learning how to understand the meanings of pictures and signs. Students who receive this kind of training can comprehend the steps and reasoning involved in designing something with clarity. Additionally, the act of integrating images and signs makes it easier to create a poster that may effectively communicate a desired message; additionally, the development of such a poster subtly raises students' aesthetic achievement.

Reference
Arnold-Murray, K. (2021). Multimodally constructed dialogue in political campaign commercials. *Journal of Pragmatics*, *173*, 15-27.

Bulakh, I., Kashchenko, T., Harbar, M., Praslova, V., Riabets, Y., & Divak, V. (2022). The Integrity of the Artistic Image of the City Based on Symbolization (the Case of Modern Architecture of Dnipro, Ukraine). *Civil Engineering and Architecture*, *10*(3), 874-887.

Celhay, F., Cheng, P., Masson, J., & Li, W. (2020). Package graphic design and communication across cultures: An investigation of Chinese consumers' interpretation of imported wine labels. *International Journal of Research in Marketing*, *37*(1), 108-128.

Chen, Z. T., & Cheung, M. (2022). Consumption as extended carnival on Tmall in contemporary China: a social semiotic multimodal analysis of interactive banner ads. *Social Semiotics*, *32*(2), 163-183.

Duan, J. (2023). Investigating the impact of cross-cultural adaptability on the academic and social experiences of international students in bioethics education. *Journal of Commercial Biotechnology*, *28*(1). https://doi.org/https://doi.org/10.5912/jcb1324

Ho, W. Y. J. (2019). Developing professional communication: The construction of a multimodal understanding of job interviews. *Languages*, *4*(1), 5.

Hsun, W. P., & Jie, G. (2022). Systematic creation of a city's visual communication: logo design based on the phoenix flower in Tainan City, Taiwan. *Visual Communication*, *21*(4), 542-559.

Hu, B., Zelenko, O., Pinxit, V., & Buys, L. (2019). A social semiotic approach and a visual analysis approach for Chinese traditional visual language: a case of tea packaging design. *Theory and Practice in Language Studies*, *9*(2), 168-177.

Imperial, D. (2020). Constructing myths via art of controversy: A semiotic analysis on political cartoons. *International Journal of Linguistics and Translation Studies*, *1*(3), 81-99.

Knain, E., Fredlund, T., & Furberg, A. (2021). Exploring student reasoning and representation construction in school science through the lenses of social semiotics and interaction analysis. *Research in Science Education*, *51*, 93-111.

Nuban, P. N. (2023). Semiotic Analysis of Structuralism in Advertising'Energen Products'. *Available at SSRN 4487132*.

Schielke, T. (2019). The language of lighting: applying semiotics in the evaluation of lighting design. *Leukos*, *15*(2-3), 227-248.

Schifferstein, H. N., Lemke, M., & de Boer, A. (2022). An exploratory study using graphic design to communicate consumer benefits on food packaging. *Food Quality and Preference*, *97*, 104458.

Shukla, M., Misra, R., & Singh, D. (2022). Exploring relationship among semiotic product packaging, brand experience dimensions, brand trust and purchase intentions in an Asian emerging market. *Asia Pacific Journal of Marketing and Logistics*, *35*(2), 249-265.

Suhaimi, M. S., Hashim, M. F., & Sha'ri, S. N. (2019). Visual illustration and photography on Islamic book cover designs: A semiotic analysis. *International Journal of Heritage, Art, and Multimedia*, *2*(5), 34-41.

Uluğ, E. (2022). An investigation into the connotations of iconic buildings by using a semiotic model of architecture. *Social Semiotics*, *32*(2), 279-300.

Weber, W. (2019). Towards a Semiotics of Data Visualization–an Inventory of Graphic Resources. 2019 23rd International Conference Information Visualisation (IV),

Weber, W., & Rall, H.-M. (2022). The Semiotic Work Design Can Do: A Multimodal Approach to Visual Storytelling. In *Periodical Studies Today* (pp. 187-204). Brill.

Widnyana, I. B. G. D. A. (2023). Structuralism Semiotics Analysis of Ferdinand De Saussure on ABC Sambal Sauce Advertising. *Journal of Aesthetics, Design, and Art Management*.

Wu, Y. Q., & Cheong, C. Y. M. (2021). Corporate branding of academic institutions: Semiotic communication of logos and names. *Journal of Marketing for Higher Education*, 1-23.

Xiong, T., & Peng, Y. (2021). Representing culture in Chinese as a second language textbooks: A critical social semiotic approach. *Language, Culture and Curriculum*, *34*(2), 163-182.