

## AN INDUSTRY-ACADEMIA COOPERATION CREATIVE RESEARCH OF THE SIGN MAKING COURSE

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**ABSTRACT.** *This study signed a design contract to collaborate with Adonis International Ltd. to integrate design projects to the Sign Making curriculum so that students would be able to come up with creative concepts for signs that match the needs of the industry. Moreover, through a selection mechanism, oral reports and exhibition works that were believed to be appropriate were selected by the industry, and awards, as well as scholarships, were presented for encouragement. The results presented by this article enable the academic community to be in step with the industry, help students understand the characteristics of the industry as early as possible, and solve the problem of developing creative ideas for new products. Moreover, this article has a substantial contribution to the practical side of teaching.*

**Keywords:** Sign making course, Digital media, Drawing software

1. **Introduction.** A graphic image is a material representation of human visual perception. It can be obtained through optical devices such as cameras, telescopes, and microscopes. It can also be created by humans, for example, hand-painting. Images can be recorded, stored on paper, films, and other media sensitive to optical signals. The development of digital acquisition techniques and signal processing theories made storing an increasing number of images in digital form possible. However, occasionally, the word image refers to digital images. Image-related topics include image acquisition, production, analysis, processing, etc. There are static images (pictures, photos) and motion pictures (movies). An image is a kind of visual symbol. Professionally designed images can be developed as a visual language for people to communicate with one another. It can also be a historical material for understanding ethnic cultures or historical origins. A large number of paintings, sculptures, and architecture in world art history can be regarded as cultural assets of human civilization in image form from ancient times to the present [5].

From the perspective of visual communication, all images seen by people are mostly collections of symbols. A symbol is a means of human communication. Elements that constitute a symbol are the symbol itself, things or meanings represented by the symbol and the user or interpreter of a symbol. A symbol has both a surface and an intrinsic connotation. For example, the denotative meaning of a rose is that it is the flower of a shrub; its intrinsic meaning is dependent on the user, for example, love. The systematic study of symbols is called semiotic, and it is divided into: (1) syntactics, the study of the symbol itself or the relationship between a symbol and another symbol; (2) semantics, the study of the relationship between the symbol and its extensive and connotative meaning; and (3) pragmatics, the study of the relationship between the image and its user or interpreter [4].

This article integrated industry-academia partnerships into the teaching and learning of design disciplines and fully demonstrated the characteristics of technical vocational education as well as the innovative practices of teaching. It has a positive impact and contribution to schools, teachers, students, and manufacturers. Overall, this relationship between partners establishes a better and unimpeded pipeline for the creation of an industry cooperation demand list for schools which the teachers and students can use to gain more opportunities and achieve practical teaching results.

**2. Literature Review.** With regard to the study of symbols, the effect of public symbol designs on the elderly was explored. 31 subjects were asked to interpret 28 symbols in the public domain, and their thoughts on these signs were collected. The study found that persons of different gender had different interpretations of the images which were not affected by their education level, image vividness, personal preference, visual perspective, etc. The research results were collected as reference data for the revision of public visual symbols so that images could be designed in a way that gives people a sense of familiarity and easy identification with the design [2].

The study selected 48 novice designers (evenly divided between male and female) and investigated their attitude and practice when consumers participated in the design of public symbols. Consumer designs were given to novice designers as a reference during the concept development phase, then feedbacks on the design were collected. The results show that novice designers adopted the consumer suggestions in their design drawings. Furthermore, they were able to improve the aesthetics of their design. However, different gender had significant differences in the area and degree of modification, with females being more proactive than males [1].

Some scholars also applied symbol design in the model creation process and discussed the influence of different routing symbol designs on a person's ability to understand model creation. The study conducted experiments on 154 subjects to determine which visual design principles would affect their understanding of the model. The results show that the use of appropriate design principles could improve the ability to identify symbols and the accuracy of understanding. Symbols are semantically clear; hence, aesthetically pleasing designs can also reduce difficulty in understanding [6].

The Industry 4.0 era inclines to the use of Augmented Reality (AR) technology to realistically present the situation of the time and solve possible misunderstandings in the process of text translation through technical control and detailed graphical symbol vocabulary. To maintain the stability of the system operation, a more understandable symbol glossary based on user characteristics was developed. Research results enabled the technical files used by the industry to be more visual via the conversion of the most frequently used motions into 2D graphic symbols and the creation of a symbol glossary that can be used continuously in the system for augmented reality graphics [3].

Discussions were made about the content of warnings in military flight manuals conveying personal injury, danger to life, damage to things, etc. Results show that the effectiveness of these warning messages is crucial for flight safety. There is an urgent need to develop a method that enhances the effects of these warnings. The incorporation of visual signs to warning messages would make the warning signs in flight manuals more effective [9].

Some scholars believe that the interchangeable use of inanimate and animate visual symbols on bicycle lanes or pedestrian trails is often confusing. In their study, 35 subjects were selected to compare and analyze the legibility and user preference of inanimate and animate symbols, as well as to explore the design features of visual signs for bicycles. The results show that conceptual compatibility, familiarity, and perception were considered to be important factors in symbol design. Preference was given to animate symbols compared with inanimate ones. Moreover, they provided better readability [7].

Some scholars conducted cross-cultural studies to explore the visual symbols in multicultural community medical facilities. 100 subjects were selected with a mean age of 27.6 years (16-55 years), of whom 84% were females. An investigation was made on 28 healthcare symbols (such as vaccinations and laboratory) and 18 general-purpose signs (such as elevators and restrooms). Results show that healthcare symbols were more difficult to comprehend than general-purpose signs. Symbols of abstract concepts were most likely to be misunderstood. The research proposed that in accordance with the current situation of an aging society, the consideration and design of signs in healthcare facilities should be expanded to meet the needs of the elderly [8].

Some scholars believe that inappropriate masking methods could lead to blurred images. Therefore, based on existing theories, image masking was discussed with the image filtering operation. It was found that the IC-BSIF method could encrypt different types of images into noise-like images. Furthermore, it could generate a more secure encryption than other modern methods [10].

**3. Creative Design.** A good visual image symbol design is obvious to the user at a glance. In a life that accentuates creativity, good creative expressions increase steadily. From the literature review, many scholars used visual symbol design in various fields to provide human beings with a safer, more comfortable, and more convenient life. Of course, the ease of reading, the sense of beauty, and the possibility for misunderstanding of symbols are all points that must be considered for creative ideas.

Creativity and entrepreneurship are the requirements of a technological life in this new era. In a highly competitive market environment, people in the industry need continuous innovation and change to sustain the operation. Moreover, the creative society needs to face issues such as co-innovation and knowledge sharing. This article integrated an industry-academia cooperation creative visual design into the Sign Making curriculum. Through this program, the industry suggested design requirements, and the teacher provided guidance. Then, the students used this creative cooperation model to carry out creative designs of signs. Secondly, the teacher and the industry prepared the following benchmark for scoring: image legibility (40%), visual design creativity (30%), color (15%), and beauty (15%). The selected outstanding works were then awarded certificates and scholarships. In this cooperation model, the industry provided award-winning scholarships for students, and the school issued the certificates. However, the right to use the creative concept diagrams inspired by the teacher-student creation process is shared by the industry, the teacher, and the students.

**4. Design Results.** The instructor invited industry professionals to judge the work of first-year students in the Digital Media Design Department of Far East University for the Sign Making course where they created signs for Pierre Cardin mobile phone cases. The students were required to write the creative concepts, deliver verbal reports, and design drawings of their own work. After a fierce competition, the winners were announced according to the marking system, and awards and scholarships were given out. The following are student works that show excellent creativity.

**4.1. Lithe cat Qiao-jie.** The idea of combining the image of a cat with that of a high heel shoe was created because as the cat yawns and stretches, the image generated is like a high-heeled shoe. In addition, because the cat's action is very lithe, it denotes that walking in high heels would make one feel very light. Qiao-jie means clever and sweet, suggesting that visual image designs on mobile phone cases can be more diverse (Figure 1).



Designer: Yi-Wen Wang

FIGURE 1. Lithe cat Qiao-jie

4.2. **Forrest Gump duck.** The use of an inconspicuous duck as an image for visual design conveys that although a duck is not as beautiful as a swan, being able to break through the current situation and predicament could show its Forrest Gump spirit. This is a metaphor for a seemingly inconspicuous person turning the tide like the brave Forrest Gump and being successful one day (Figure 2).



Designer: Jia-Yi Guo

FIGURE 2. Forrest Gump duck

4.3. **Treat visitors mannerly.** The image of a capybara was drawn in low poly style accompanied by hollow English fonts for slogan. Capybaras give people the impression that they are easygoing and friendly, and that they can get along well with other sea animals. Using “Treat visitors mannerly” as a slogan, the soft circular bottom is in contrast with the main picture and gives an overall sensation of gentle beauty. The selected color is a less saturated gray-blue which gives a visual effect that does not offend people’s eyes (Figure 3).



Designer: Chen-Xi Liao

FIGURE 3. Treat visitors mannerly

4.4. **Dolphin.** Dolphins are among those with the highest intelligence in the animal kingdom. They swim in vast oceans every day. The ancient Greeks called them the soul of the sea. Metaphorically, it denotes that life is like a strong soul. Dolphins living in waves are likened to that which lies the human heart, a life with a special existence (Figure 4).



Designer: Jin-Long Zhong

FIGURE 4. Dolphin

4.5. **Wolves.** The image of a wolf was put together with sharp lines to convey the frivolous and fearless courageous advancement of the young people. There may be many difficulties and limitations in front of us, yet, if there is courage, success will follow (Figure 5).

During the creative thinking process, the teacher guided the students in envisioning creative ideas and stimulated their unlimited creative possibilities. The scholarships provided by the industry acted as incentives for learning and motivated students to show creativity. In short, this teaching practice is a very good method and is worthy of promotion.

5. **Conclusions.** This article integrated industry-academia cooperation into the teaching and learning of the course to produce the best combination of theory and practice



Designer: Zhi-Jie Xu

FIGURE 5. Wolves

and attain a win-win strategy. In general, the results for the innovative research and development of this study are summarized and illustrated below.

(1) For teachers and students, this can help students be familiar with the industry early and integrate learning content with application to achieve the best combination of theory and practice. It is also effective in the enhancement of the teacher's professional knowledge and is worth promoting.

(2) For the school, a good innovative commodity development exerts great influence and benefit on the reputation of the school. Therefore, the school should grant recognitions and rewards.

(3) For the industry, a student's creative design is often not in accordance with the rules and may often be unpredictable and unrealistic. This is also the greatest difference between an amateur designer and an industry designer. The final stage depends on how the industry chooses.

(4) Overall, the integration of industry-academia cooperation to the curriculum not only brought forth positive effects and benefits for schools, teachers, and students but is also worthy of promotion and application.

In the future, this study hopes to see that more companies would be willing to invest in the establishment and maintenance of an industry-academia cooperation with schools so as to encourage more outstanding teachers and students to collaborate with the industry in order to produce many high-quality creative ideas and assist the industry in product development and innovation through frequent brainstorming. This relationship also enhances the practical ability of teachers and students and achieves the goal of diverse practices for teaching and learning.

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