Establishing a training mode for art engineering using art classification codes

Yan Wang†, Hong Liu‡ & Dongsheng Chen†

University of Minjiang, Fuzhou, People's Republic of China†
Henan Institute of Engineering, Zhengzhou, People's Republic of China‡

ABSTRACT: The fostering of talents in art engineering originated from the cultivation of innovative talents in the Japanese educational field of design. Based on the analysis of the origin of the classification of art, the development of the dividing line between art and engineering is discussed in this article. It is also pointed out that the trend is toward the elimination of this dividing line as a result of the development of technology. The authors conclude that, given the historical background of this subject, promoting the training of personnel in *art engineering* for the talented in China complies with current trends for talent training and is the correct approach for art education.

INTRODUCTION

In the Odyssey of Homer, Odysseus takes prudent measures when leading his fleet around an island on which the Sirens, who lure men to their death, live. The fleet must sail to a place before hearing their song. So, Odysseus gives an order asking others to tie him to the mast and he also tells them to plug their ears with beeswax. He also warns them to ignore his orders and gestures while passing around the island. When they are close to the island, Odysseus hears the Sirens' enchanting song. The song is so captivating that he struggles despairingly to free himself from his restrictive bonds in an attempt to reach the Sirens, who are dangerous and beautiful creatures. But no one can hear him. Finally, when they pass the island, and the seamen would not hear the haunting and sweet song, they untie Odysseus and take the wax out of their ears. An elder sister, Parthenope, loves Odysseus deeply. When his fleet leaves, she drowns herself in the sea to end her life.

THE CONNOTATION OF ART ENGINEERING

The Frankfurt School philosopher, Theodor W. Adorno, said in his co-authored work, *Dialectic of Enlightenment*, that the forceful separation of art from labour leads to an infertile imagination and loss of creativity. This is incurred by industrial society. To avoid the temptation caused by the Sirens' captivating and enchanting songs, Odysseus asks the seamen to plug their ears with beeswax. But as the controller of the ship, in his wish to hear the alluring Sirens' songs, Odysseus endures being tied to the mast. *The rope that ties Odysseus makes the Sirens' temptation become useless, which thus supports the object of meditation and constructs the pure art* [1]. It is observed that a group of manual workers-bowmen mechanically paddle a canoe and none is as deaf as those who will not hear. Odysseus loses his powers completely (e.g. by being tied to the mast). He separates spiritual activity from the physical and spiritually enjoys it; thus, he survives.

Separation of Art from Labour

Art is separated thoroughly from labour, and this separation reaches its peak during the era of industrialisation. *Bowmen are connected together by the same rhythm, just like labourers in the factories and films* [2]. Art that combined sacrifice, production and praying was necessary in days gone by, but it became useless in the industrialisation era. When the song becomes the art, labourers will not be affected, even when hearing it, but simply treat it as background music while they work. On the other hand, for those free from labour and who just enjoy the song, the beauty of songs has nothing to do with the direct labour of real life.

The separation between art and labour is also significant in the field of art design education in present-day China. In reviewing the discipline category catalogue issued by the Ministry of Education, art and engineering belong to two

different groups. Taking the undergraduate majors of fashion design and engineering as an example, the majors of design and manufacturing are clearly defined according to the professional categories of art and product manufacturing.

Undergraduates who major in fashion design will be awarded a Bachelor of Arts degree, while those majoring in textile engineering will be awarded a Bachelor of Engineering degree. Such classification was appropriate in earlier days since it cultivated a group of professional and specialised design and engineering talents quickly and efficiently. But, eventually, there were disadvantages, too. At present, the separation of art and production reduces innovation and results in a shortage of talent. *The mode of design education in modern China is actually the reason that the country falls behind in international economic competition. By reviewing the successful examples of synchronous development of design education and manufacturing industry in these Asian emerging industrialized countries and regions, such as Korea, Singapore, Thailand, Taiwan and Hong Kong, it is obvious to point out the problems of art design education in China* [3].

Separation of Art and Engineering

What is the so-called boundary between art and engineering? Is it necessary to clearly define the boundary between art and engineering? The starting point is the separation between art and engineering. Table 1 illustrates the boundary for two apparel majors; one considered as engineering and the other as art. The overlap and commonality should be noted.

Table 1: Training goals of an apparel major.

Discipline category	Major code/ Major name	Training goal
Engineering	081602 Apparel Design and Engineering	Cultivate the applied professional talents who possess the knowledge and capability in the area of apparel design and engineering; adapt to the development trend of disciplinary integration of apparel with the material, information, management, marketing and trade, and humanities art; possess the consciousness of innovation, practical ability and international outlook, accomplished in the certain aspect of apparel design and engineering, and are capable of serving in the departments or institutions of apparel enterprises, apparel industrial association and government departments for product planning and design, technology, production and operation management, marketing and trade, and industrial management.
Art	130505 Fashion Design	Cultivate the advanced professional talents who can engage in fashion design and planning and fashion research; possess the strong abilities of design, creation and practice; have the strong consciousness of market design and ability in market competition; grasp the basic operational knowledge of apparel enterprises and the apparel market, and also grasp fashion trends and the basic methods of forecasting trends, and are capable of working in the areas of apparel art design and application research, and the institutions of art design in design, research, teaching and management.

Note: According to the Catalogue of Majors for Undergraduate Students in Institutes of Higher Learning and Major Introduction pp. 228 and 364.

Art Classifications - an Historical Perspective

For the ancient Greeks and Romans, art was an important force and involved much knowledge. Science and technology were involved in art. Aristotle regarded art as helping people to know the world. Different art forms (literature, painting, sculpture, music, dance, geometry, astronomy and architecture) demonstrate the nature of things by different methods. Modern people use the word, *art*, to describe all art, but ancient people used *Techne*, meaning *craft* and *techniques*. The classification *Techne* may be *liberal* or *vulgar* [4].

The liberal arts include geometry and astronomy, while the vulgar ones include painting and sculpture. In the middle ages, the church adjusted art classifications but not their essential nature. According to Thomas Aquinas, art establishes the *rational order* that people need to receive revelations from God. Seven *liberal* arts are logic, rhetoric, grammar, arithmetic, geometry, astronomy and music. The *vulgar* arts are also named as being *mechanical* ones, including manual workshop manufacturing [4].

In the mid-18th Century, the development of technology and of a liberated bourgeoisie led to the reclassification of arts and artworks. As a result during the 200 years from the mid-18th Century to the mid-20th Century, art was distinct from engineering. Then, it was for the first time that the word, *beaux-arts*, appeared as a professional label to cover music, poetry, painting, drama and dance. Works of a technical and production nature were separated from those of art. The French social commentator and political thinker, Montesquieu, used the term, *fine arts*, which appeared in an article in

the Encyclopédie dated 1775. In 1735, the German philosopher, Alexander Gottlieb Baumgarten, proposed the word, *aesthetics* and the corresponding one, *technology*. As classification evolved, they became *art* and *engineering* as at present [5].

It was an historical necessity for early bourgeois scholars to adopt such a classification scheme. It was appropriate from the perspective of early mechanised production and the classification of arts in the middle ages. It was, therefore, to *save the art from the God*. The result is that from bourgeois society to now, there is still an obvious chasm between art and engineering.

Impact of Technology on the Classification of Art and Engineering

A discussion is needed as to whether such classification has advantages and whether there should be a clear difference between art and engineering in the educative fields of art design and engineering. First, the clear distinction between art and engineering treats art as an eternal system. According to the 18th Century philosopher Immanuel Kant, there are three types of art: the plastic art of lines and image; the language art of speech and writing; and the music art of tone. Using such a classification principle, it is easy to categorise art: for example, painting, sculpture, architecture, design and music. They are all important and lead to other standards and principles. Such a system established by generations of human beings seemed to be changeless. But since the 20th Century, the art forms associated with technology, such as photography and film, do not fit within the former classifications. Photography, as German literary critic and philosopher Walter Benjamin indicates, destroys the traditional boundary between art categories. The new communication technologies, such as CDs, radio, television and DVDs, further break the traditional boundaries.

The attack by technologies on classification leads to the fragmentation of the categories. Critics who defend art standards find it hard to suddenly define new art concepts. For Andy Warhol, one of the representatives of pop art, is not his Marilyn Monroe poster, art? *His work is the duplicate. He just wants to replace the position of original work by numerous duplicates. He eliminates the personality and emotion of the painting on purpose and lists out the ordinary images. There is a famous proverb; I'd like to be a machine, which forms a sharp contrast to Jackson Pollock's [artist]* I am nature [6].

Reconciliation Between Art and Engineering

Second, does incompatibility exist between art and engineering; namely, aesthetics and applied technology? At the end of the 19th Century, the textile designer William Morris argued there is no distinction between the arts, but only between the good and bad technologies and skills. One also has to re-evaluate the sciences: are not Einstein's theories art? If something has use, should one not regard it as art? Actually, in the field of engineering, there is beauty: the beauty of rhythm, cadence, arrangement and lines of materials and reproduction by different kinds of new media. Meanwhile, the beauty of design art is closely related to the materials used.

For example, it is an important quality for experienced apparel designers to skilfully apply the apparel materials. Designers should consider the difference between thin and thick, soft and hard, smooth and coarse, solid and flat of the materials used. They need to experience the difference of styles by the senses, e.g. overhanging, gloss, cleanness, thickness and elasticity of materials. Hence, they experience the difference between styles and, thus, can apply it in the design. It is hard to imagine how Issey Miyake (a Japanese fashion designer) designed the classical *Pleats Please* series if he did not thoroughly study the materials.

Third, art is controlled by some class and gradually becomes a type of religion. It is one of the reasons for the present-day division between art and engineering. The art world is liberated from the constraint and control by religion, but it still adopts some traditional terms and words from religion. *High art* is derived from *high-church*. Compared with classic texts, such as the Holy Bible and the Koran, the art festival also has so-called classical works and paradigms; while compared to those idols of religion, such as the Saint, Sadhu (an ascetic holy man) and Akhond (a religious scholar), the art world also has spiritual idols of masters and legendaries in design.

Karl Marx and the western scholars of the Marxist school who followed, have studied this for a long time. For instance, French sociologist Pierre Bourdieu proposed the concept of *cultural capital* in art culture. *Cultural capital* is another form of material capital. Similar to material capital (of worth), its accumulation equals controlling the production system and exploiting the interests and rights of the so-called *lower* classes. This selection implies exclusion. For Marxist critics, the strict selection of the scope of art over the past hundreds of years is equal to choosing artists according to class, gender and race. For the upper class, art can be customised. It is just like the ready-to-wear stores in Savile Row in London and Fifth Avenue in New York. Some so-called artists have similar thoughts.

But with the development of modern communication technologies, art has become more democratic and public. The concept of high-art is hard to maintain. The bourgeoisie, who once did their best to release art from religion have found themselves sacrificed in the new round of social and religious discrimination. During this process, systematised art and engineering are to be combined and integrated again. This process cannot be avoided, given the constant development of society, the progress of technology and the expansion of markets.

Fourth, in consumer society, consumption is not limited to material products, but to comprehensive products of all kinds. People not only require useful products, but also wish to differentiate them from other products. People purchase clothing not only considering its useful value, but also for its hidden significance because the different styles and brands reflect human personality and social status. According to the writer, Jean Baudrillard, modern capitalist society is not driven by manufacturing any more, but rather by consumption. The value of modern commodities is not their value for use, but their social significance as a *symbol*.

The possession of articles is not for their function, but their significance; namely, the set of abstract and symbolic values. It is a highly symbolised society. People gain recognition of self and others according to the symbolic significance of consumer goods. The symbolic significance related to social value differentiates people according to the differentiation of goods. In this regard, the apparel industry in western countries is ahead of China. There, emphasis was placed on design and brands, even at the beginning of the last century. Brands, such as *Chanel* and *Christian Dior* have spread throughout the fields of clothing, cosmetics and luxury goods. The textile and garment industry in China is still nearsighted, with a non-emphasis on brands.

The textile industry in China should be transformed and upgraded, from an export-orientation to domestic consumption, and from low-end to middle- and high-end. To realise such a transformation, the industry should emphasise science and technology, design, brand construction, management systems and marketing. The industry should be supported by government policy and investment. Over the past 30 years, since the reform and opening up of China, there have been limited middle- and high-end brands in the country's textile industry. But there are numerous foreign middle and high-end brands occupying the market. There clearly is room for the development of domestic brands.

Brand development requires the cultivation of talent that combines engineering and art. Students who major in engineering should know more about the principles of design. This would not only explore the usefulness of apparel materials, but also help to promote the symbolic value of materials. A representative designer is André Courrèges, who graduated as an engineer and also served as a pilot. His designs always adopt vivid, light colours, with characteristic modern, angular principles. The future will be favoured by young people.

CONCLUSIONS

In conclusion, it is necessary these days to integrate *art* and *engineering*. Accordingly, the so-called training goal of developing *art engineering* creative talents is to meet the needs of the construction of socialist modernisation and to develop morally, intellectually and physically. The apparel industry must develop the knowledge and capability of skilled apparel design and of production and marketing. This means grasping the principles of apparel composition, grading technology, the use of materials, production technology and management. At the same time, the apparel industry needs to be highly adaptable.

To reiterate, the apparel industry requires design, development, production, manufacturing and marketing capabilities. *Art* means artistic attainments and accomplishment, including aspects of social science, humanities and aesthetics. *Engineering* means attainments with the background of engineering and, in aspects of computer-aided design, fundamental mathematical theories and apparel materials.

Art engineering, according to the training goal for creative talent, possesses the following advantages:

1. Advance with the times and enhance the attainments in art and engineering. Students with the single major would have compound, comprehensive talents. This can meet enterprises' demand for talent.
2. Enhance students' employment opportunities. They would adapt to the work quickly after graduation and possess strong, adaptable abilities.
3. Establish a unique teaching style, and make full use of the advantages of Minjiang University and existing hardware and software resources.
4. Expand social influence and promote the quality of the student pool in the Department of Garment and Art Engineering, Minjiang University.
5. *Art engineering* training by cultivating groups can encourage professional teachers to change from single- to multi- mode teaching, which will enrich their professional skills and promote higher levels of scientific research.

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