

Government-aided Academic-Industrial Collaborative Capstone Design Class : A Case Study on the Development of Lifestyle Products with the Application of Graphic Art and Digital Textile Print

Hyunjoo Kim

Department of Fashion Merchandise Design, Dankook University, Yong-in, Korea

Abstract

Background Due to the recent spread of sensitive consumption, 'lifestyle design' brands that utilize graphic design have become the biggest issue in the worldwide design market, because design has been developed as the core factor of product competitiveness. Meanwhile, in the domestic markets, lifestyle brands that counteract global lifestyle brands are nonexistent.

On the other hand, government-level support and investment have been largely expanded with promotion policy to enhance a creative industry in order to overcome the slowdown of the Korean textile and design exports due to the loss of price competitiveness in the global competitive era. Accordingly, this study focuses on the launching of a global lifestyle design brand based on a government-aided academic-industrial collaboration project, which could contribute in the development of various skills for learners, generate revenues for industries, and create national wealth.

Methods & Results This research is primarily divided into three parts: theoretical background; case study and suggestions for a government-aided academic-industrial collaboration capstone design course; and future progress.

First, we established the definition of lifestyle design brand based on the theoretical studies related to lifestyle design, and the analysis of domestic and overseas markets. Second, we reviewed and studied the definition of academic-industrial collaboration and characteristics. Third, we investigated and suggested a new curriculum for a capstone design course related to the academic-industrial collaboration of 'lifestyle product development, which utilize high-sensitive graphic art and high quality digital textile print(DTP)'. The government-aided project proceeded as a part of a global professional technology-development business funded by the Ministry of Industry, Trade, and Energy, and the Korea Institute of Industrial Technology Evaluation and Management, from May, 2013 to May, 2014. Fourth, we suggested the content related to commercialization after the termination of government support.

Conclusions This study resulted in the investigation and launch of a design brand through academic-industrial collaboration based on a government-aided projects while promoting commercialization and creating results by effectively utilizing infra of each other. Therefore, we expect that the establishment of a national high-value lifestyle brand could surpass representative global lifestyle brand from Finland, called 'Marimekko'. The study reinforces the base of global competitiveness and the enhancement of image as a design power.

Keywords Academic-industrial collaboration, Capstone design, Graphic textile design, Digital textile printing, DTP, living design, Fashion product design

The following research was conducted by the research fund of Dankook University in 2014.

Citation: Kim, H. (2014). Government-aided Academic-Industrial Collaborative Capstone Design Class: A Case Study on the Development of Lifestyle Products with the Application of Graphic Art and Digital Textile Print. *Archives of Design Research*, 27(4), 39-57.

<http://dx.doi.org/10.15187/adr.2014.11.112.4.39>

Received Jul. 07. 2014

Reviewed Aug. 07.

2014 **Accepted** Aug.

11. 2014

pISSN 1226-8046

eISSN 2288-2987

Copyright : This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>), which permits unrestricted educational and non-commercial use, provided the original work is properly cited.

1. Introduction

1. 1. Background and purpose of research

The area of fashion has expanded into the concept of total lifestyle that includes not only clothes but also miscellaneous goods and accessories. Thus, 'lifestyle design' has become the biggest issue in the global design market which is seeking for new growth engine in the long-term economic depression. Experts expect that this fever of lifestyle brand will be more expanded in the future.

In domestic markets, representative global lifestyle brand 'IKEA's' mere announcement of advancement into Korean market has greatly hit domestic lifestyle brand industry, and the solution for domestic markets is to promote professional brands with unique concept and design technical skills that can counteract global brands and development of related products. Thus, active research and study on the development of lifestyle design products are required.

Meanwhile, government-level support and investment have been largely expanded as the promotion policy to enhancing creative industry in order to overcome the slowdown of Korean textile and design exports due to the loss of price competitiveness in global competition era. Particularly, academic-industrial collaboration has risen as the big issue as the major keyword of 'creative economy' pursued by the present government. It is a current trend that academic-industrial collaboration projects are largely expanding in the forms of government projects.

On the other hand, discussions regarding the effectiveness of academic-industrial cooperation and the way of progress has been arising; however, it is very encouraging that the matter is considered preferentially in the government projects according to the keynote of policy, i.e. 'promotion of creative industry through scientific technique(including excellent technology of university)', ' Creation of ecosystem of creative industry through academic-industrial collaboration'. Accordingly, various design fields including graphic design, industrial design, and fashion design has been establishing Capstone design classes and integrated design classes based on academic-industrial collaboration projects. Such curriculum can be stated as a positive example of providing students an opportunity to gain hands-on experiences with projects that have real-world applications such as planning, analyzing, brainstorming of concepts, designing, and overall problem-solving of issues presented in various design industries.

Thus, the following study focuses on the proceeding of Capstone design class based on market research and design development through the application of government-aided academic-industrial project of developing global lifestyle design brand in Korea.

Ultimately, the following research results in the creation of technical and economic ripple effect through studies and projects while also results in the modification of social opinions toward academic-industrial collaboration projects.

1. 2. Method and scope of research

This research is largely divided into three parts, 1. theoretical background 2. case study and suggestion of Capstone design class based on academic-industrial collaboration 3. future progress henceforth.

First, the definition of lifestyle design brand was established based on the theoretical background related to lifestyle design, and related analysis of domestic and overseas markets was proceeded. Also, definition of academic-industrial collaboration and recent stream were reviewed and studied. Based on this, the researcher investigated and suggested a new curriculum of Capstone design class related to academic-industrial collaboration of 'lifestyle product development utilizing high-sensitive graphic art and high quality digital print(DTP)'. The government-aided project proceeded as a part of global professional technology-development business funded by the 'Ministry of Industry, 'Trade and Energy', and 'Korea Institute of Industrial Technology Evaluation and Management', for one year from May, 2013 to May, 2014. Also, the content related to commercialization after the termination of government support was suggested.

2. Current state and the necessity of related product development

2. 1. Definition and characteristics of lifestyle design

It is within bounds to say that 'lifestyle design' is the biggest issue in the modern design world. Recently, lifestyle design is used by being mixed with the concept of living design, or used in a broader meaning than the concept of living design. First, the term 'lifestyle' has been fully recognized since the introduction of the term as way of expressing individuality and smartness in our whole life, along with the public recognition on style, starting from wearing clothes(style in fashion) to eating, doing, etc.' (Kim, Y. & Kim, H., 2014).

Thus, the concept of lifestyle design contains the concept of living, interior, and fashion, which reflect the lifestyle, culture, and individualism of the users. Accordingly, 'lifestyle design brands' differ from existing brands in that each living products reflect particular story, culture, and lifestyle of the consumers. Recently, the trend of living design is 'new family scene', which contains fashion, interior products, furniture, and other living items that could be enjoyed by various age groups.

Those who started to suggest the concept of 'lifestyle' were fashion and textile-related business people who were sensitive to trend, and came forward by learning that lifestyle was the new fashion and the item. Lifestyle design brands, which appeared based on this background, acted as the new trend generator by corresponding to today's consumer needs, who desire to decorate their own space as well as themselves.

2. 2. Current state of the overseas-domestic lifestyle design market and brand

Recently, the stream and the circulation of the worldwide fashion is dominated by lifestyle brands. Particularly, before and after the year 2000 along with the fall of department stores, markets have been reorganized as cultural space mainly with multi-shopping malls and select shops, while lifestyle brands have settled as the core engine of fashion circulation.

Lifestyle design brand is differentiated from other existing brands in the respect of suggesting consumers' lifestyle through the collection of various items including clothes. Consumers of lifestyle design brands purchase a kind of story or cultural experience through lifestyle design products, rather than concentrating on individual products.

Due to the improvement of the standard of living, house is no longer a mere residential

space, but rather emphasized as a fashionable space where fashion and lifestyle coexist, and items which compose lifestyle brands are filled with the products that reflect our lives. Thus, lifestyle products include not only clothes, but also contain products necessary for living, such as furniture, upholstery, bowls, candles, doll, stationery, flowerpot, kitchen utensils, body products, etc. In other words, the number of items and the proportion of fashion products remain the same, but the categories and types of lifestyle products have largely expanded.

Lifestyle brands of the world can be largely divided into three groups. First, the case of developing as an expanded brand of a fashion brand, second, developing as a lifestyle brand by itself, third, developing in the form of a select shop, where various items of various brands are sold in a single shop.

First, in the case of global fashion brands, there are many cases of establishing interior home brands or lifestyle brands as the concept of brand extension of the existing fashion brand. In other words, a trend is accelerated that the companies, which have luxury brand of which brand image was firmly established, newly establish home-living brand to expand business scope by utilizing existing brand image and reinforcing customer awareness as brand competitiveness.

Main examples of extended brand are Hermes, Armani, Fendi, Anna Sui, Christian Lacroix, Etro, Missoni, Versace, Vera Wang, Blumarine, Kenzo, Bottega Veneta, Zara, H&M, which are global fashion brands. These brands each have extended their home brands to Hermes Home, Armani Casa, Fendi Casa, Anna Sui Home, Christian Lacroix Home, Etro Home, Missoni Home, Versace Home, Vera Wang Home, Blumarine Home, Kenzo Maison, Bottega Veneta Home, Zara Home, H&M Home, etc.

The above brands mainly include products such as fabric, furniture, stationery, etc., which contain home wear, table wear, curtain, and cushion. The biggest part and proportion of items are fabric, i.e. textile division. Lee, E.(2009) studied the characteristics of textile design that are used to express common brand identity and correlation. Particularly, motifs, design patterns, and the expression of materials were linked as the source of building brand images, while they were proposed as a fundamental source of textile design in establishing future extended brands.

Global representative lifestyle brands can be found in Northern Europe, Western Europe, the Americas, Asia. In Northern Europe, Marimekko(Finland), OYOY(Denmark), and Ferm Living(Denmark) are the main attractors of lifestyle consumers. Marimekko is steeply emerging as the leader of lifestyle design brand by utilizing various colorful pattern designs applied in various product groups while OYOY and Ferm Living of Denmark provide sophisticated lifestyle design products to consumers by combining natural materials with Scandinavian geometric patterns (Kim, 2014).

Representative lifestyle design brands of Western Europe are Orla Kiely(UK) and Cath Kidston(UK). Orla Kiely demonstrates various lifestyle product groups in application of geometric pattern design in the motif of plants and flowers. Cath Kidston presents various product groups utilizing graphic patterns inspired from vintage flowers combined with British wits.

On the other hand, representative lifestyle brands of Asia include Sou Sou, MUJI, and FrancFranc of Japan. Sou Sou presents various product groups with pattern designs combining Japanese traditional senses and modern art. Meanwhile, MUJI and FrancFranc

mainly demonstrate products centered around natural materials and natural colors that exclude bold pattern designs.

In the case of domestic markets, there are several lifestyle brands operated in the shape of select shop; however, it is difficult to find such brands based on lifestyle design and product development. Although few furniture brands such as Casamia, Hanssem, and Design Ventures handle living design product groups, characteristics that could express individual brand identity and culture cannot be found in most products when compared to foreign lifestyle brands. Recently, big industries have started to launch lifestyle design shops in the form of flagship stores. Lifestyle design shop, JAJU, which has opened its first shop in Garosu-gil, is the main example. Also, the brand 'Modern House' by E-Land Retails has extended into a living SPA brand, 'Butter' in the year 2013.

However, most domestic lifestyle design brands contain similar characteristics that are difficult to classify when the brand logos are hidden. Thus, as a result of analyzing lifestyle design-related domestic technical skills focused on beddings, most lifestyle product developments and studies are based only on the improvement of the technical details of the product such as lightweightness, functionality, heat reservation, and antibiotic sanitation, rather than the design itself.

However, as mentioned in the purpose and the background of the research, with the increase of consumer-awareness regarding human lifestyle and the environment, the demands of lifestyle products have been centered around not only on functionality and economic feasibility but also in aesthetic senses. In addition, graphic art, in terms of business, can be seen as a direct source for connecting arts and brand identity while increasing brand awareness through 'art marketing'. However, in the domestic markets, lifestyle design brands with product lines in application of graphic arts are yet to be found.

2. 3. Lifestyle brand based on textile design

Textile design is also importantly recognized in lifestyle design brands. Of all factors that form the image of a lifestyle design brand such as design, materials, colors, price, style, etc., materials are known to be the main influences. Particularly, in fashion material, textile pattern designs can rapidly counteract the trend and immediately influence brand images in visible aspects. Since materials with unique designs allow the delivery of clear visual image, lifestyle design brands in application of textile pattern designs have been increasing.

Among the domestic and overseas lifestyle brands, representative brands based on textile design are Marimekko, SOU SOU, Laura Ashley, Cath Kidson, etc. The main characteristic of these brands is the design utilizing fabrics of unique colors and patterns. Thus, such brands are satisfying their consumers through the introduction of various product lines in application of various creative textile designs from different textile designers. This way, in case of the overseas representative lifestyle brands, there's a trend to approach with 'art marketing', which is the strategy to heighten corporate desirability and awareness by visually approaching the customers by adapting graphic art to textile design in the aspect of business. However, domestic lifestyle brands that are composed of various lifestyle design products utilizing graphic arts are non-existent.

2. 4. Definition and characteristics of digital textile printing(DTP)

DTP(Digital Textile Printing), also known as digital printing, is the process of printing

colorant onto fabric by directly discharging the dye through a nozzle of a printer(Shin, 2002). It is an innovative method that allows production of small quantities in various designs and shortens the existing difficulties of hand-printing by handling the whole printing process through computer.

Compared to the conventional printing methods that require longer process such as the separating of colors, drafting, repeating, color mixing, and printing, the entire process of DTP from design to printing is handled with computer, thus, reducing production time and space, as well as improving environmental problems.

Specific advantages of DTP are as follows. First, printing is possible within a short time. Second, consumption of electricity and water is less when compared to conventional printing methods. Third, DTP eliminates the substantial amount of water and electrical energy that is required for rotary screen printing and cleanup. Therefore, greater water and power savings can be achieved. Fourth, large quantity big size output is possible. Fifth, space requirement for production is smaller than the existing printing process. Sixth, small quantity samples and mass production are available with the same printer. Seventh, by using the flexibility of the printer, various creative designs can be selected. In other words, DTP provides the option to print photographic and continuous tone images that are difficult to express in conventional printing methods. Eighth, large quantity data storage is possible. Therefore, in the fashion industry which rapidly introduces new designs, differentiation from other brands can be promoted by developing creative textile designs with various color schemes.

According to the experts, textile industries in the world have increased annually of around 30 billion yards of textile production. With this, application of digital printing for textile products have consistently expanded, so that mass production has been operated according to customers' large orders(Park, 2013). In order to satisfy this market demand, the '16th Shanghai-tex 2013 organizing committee' created a new theme zone, 'digital printing machinery zone', and introduced high-tech digital printing products.

3. Theoretical considerations of academic–industrial collaboration

3. 1. Definition and purpose of academic–industrial collaboration

The concept of academic-industrial collaboration has been defined variously according to the different time periods, different perspectives on academic-industrial collaboration, and characteristics of technology. The concept and type of academic-industrial collaboration in the broad meaning can be defined as the mutual cooperative activity between two parties-multi-parties, which embraces both formal and informal cooperation routes(Park, 2013). This research defines academic-industrial collaboration as the activity to achieve each other's goal by jointly developing knowledge or technology, products, etc., by maximizing value of each other's resources.

The operating subject of academic-industrial collaboration can be divided variously according to its goal, e.g. government, industry, government+industry, government+university(or professional research institute), etc. Among them, industries have taken the lead in supporting academic-industrial collaboration; however, while various collaboration methods aiming at technical transfer between university and industry as one of the major types of

academic-industrial collaboration has been devised, governmental support on this has largely increased.

The purposes of academic-industrial collaboration supported by both academy and industry are as follows in <Table 1>.

Table 1 Purpose of academic-industrial collaboration

Government	Industry	University
<ul style="list-style-type: none"> · Achievement of enhancing policy of national competitiveness 	<ul style="list-style-type: none"> · Efficient utilization of university knowledge through the expansion of the opportunity to approach university · Procurement of excellent manpower · Cost reduction of new technology or design, new product development · Capture of new business opportunity by challenging investment · Reinforcement of enterprise competitiveness 	<ul style="list-style-type: none"> · Provision of opportunity to change for research responsible person and promotion of research and development activity · Promotion of professional manpower with practical ability proper for industry demand and industrial development · Grant scholarship or opportunity of internship to the students · Improvement of employment · Development of university through the attraction of research fund
<ul style="list-style-type: none"> · Common research and development between industry and university · Acquisition of new knowledge · Sharing of research facilities and equipment · Personnel exchange · Exchange of recent research material through mutual advice 		

3. 2. Government-aided academic-industrial collaboration

Government-aided academic-industrial collaboration is implemented by government's support for the development process of industry's technology or new product development through the policy funds, or promoting professors' research and development activity through academic-industrial collaboration in university and inducing the effect of promoting practical professional manpower. Through this, the government can get the effect of achieving national policy goal.

It is general that the technical transfer based on academic-industrial collaboration is concretely realized through licensing contract regarding the technology targeting specific knowledge; however, the government-aided academic-industrial collaboration program includes formal-informal knowledge transfer all around the whole scope. Through this, it can promote the effect of comprehensive transfer of university, while at the same time expand the breadth of opportunity for the university to acquire the field knowledge from the industry and can achieve win-win strategy between the two organizations. (Ryu et al., 2011).

Policy goal of academic-industrial collaboration per governmental department is somewhat different; however, the emphasis of innovation, which is representative of 'creative economy' of the present government is more accelerating government-aided academic-industrial collaboration system. Therefore, it is expected that academic-industrial collaboration policy-related budget of each department, e.g. the Ministry of Trade Industry and Energy, the Ministry of Future Creative Science, the Ministry of Education, the Ministry of Agriculture Livestock Products, the Ministry of Employment and Labor, etc. will be largely increased in this year as well.

According to Park's research in 2013, academic-industrial collaboration is an important policy to emphasize innovation in university area, as well as corporate and market area, government-aided academic-industrial collaboration can be an important policy measure

to emphasize innovation in university area as well as corporate and market area. It has merits to have political efficiency, since it can exert political effect to various doers through a single policy measure, and it can be determined that academic-industrial collaboration is emphasized as the essential alternative of open innovation beyond inner innovation in respect of the innovativeness of the present government, i.e. creative economy.

4. Academic-industrial model of this research for design research and product development

4. 1. Government support project name

- (1) Project name: 2013 Global professional technology development project.
- (2) Support institute: the Ministry of Trade Industry and Energy, Korea Institute of Industrial Technology Evaluation and Management.
- (3) Purpose of project: Promotion of global professional enterprise by supporting development of global competitive products (core technology and product) of domestic small business-mid-sized corporate
- (4) Detailed business line.
 - Development of key industry professional technology > Promotion of new technology and differentiated produce development by supporting common technology development fund to the consortium to jointly promote planning~ technology development~ production~ marketing, etc.(Cooperative technology between textile life stream) Between textile fashion stream (or between textile fashion industry and other industry) > Enhancement of mature industry(old(舊) life industry) : Development of high value household items and consumer goods-leisure products, etc. blended with high-functional, high-sensitive technology to respond to the request for the improvement of standard of life.

4. 2. Final goal

- (1) Detailed business subject : Lifestyle products development by applying high-sensitive graphic art and high-quality digital printing(DTP).
- (2) Target market : Domestic, overseas lifestyle design market.
- (3) Final development products : Fashion items, home&living goods, stationery.
- (4) Expected number of developed products : Graphic art 50 items, textile design 30 items, new product development 60 cases(including DTP), commercialization 30 cases.
- (5) Final goal
 - color matching system and design database establishment and textile design development.
 - Production of highest quality DTP available for low-variety mass-production.
 - Development of lifestyle design product group applying high-sensitive graphic art.
 - Advance into domestic and overseas living design market through art marketing strategy establishment.
 - Realization of consistent sales increase and creation of jobs with opening domestic and overseas concept stores henceforth.

4. 3. Model of organization composition and promotion system

- (1) Leading institute : H corporation(株式会社), a special brand of fashion and miscellaneous items (graphic art and textile design development, living design product group design development, PR)
- (2) Participation agency 1 : Ha corporation(株式会社), a special printing brand (DTP, marketing)
- (3) Participation agency 2 : D University fashion industrial design department (information analysis, graphic art development, commitment of manpower all round the business and Capstone design progress)

5. Capstone design progress in university through academic-industrial collaboration

5. 1. Capstone design

Capstone design originally began from nominating the comprehensive educational program which was to approve design · production of work instead of graduation thesis, in order to promote the ability for the engineering department students to solve the problems which they could face in the industrial site (Ministry of Education and Science Technology, 2010). Presently, it means the comprehensive design subjects aiming at promotion of creative manpower with troubleshooting ability, cooperative ability, and practical ability, required by the society, not only in the engineering area, but also in other areas, enabling the students to experience the process of project planning, performance, analysis, etc. through team activity based on the major theory which they learned from undergraduate course. In other words, Capstone design can be defined as an integrated class that provides students in gaining hands-on experience through the application of basic design skills in design fields.

In case of design area, the subject available for the acquisition of the process of new goods production and henceforth marketing process by producing new goods or proceeding with academic-industrial collaboration.

5. 2. Selection of Capstone design class as academic-industrial collaboration project

For this academic-industrial collaboration project, a process was proceeded by selecting each subject of Capstone design class from the graduate school and undergraduate course.

First, in the information analysis stage, the early phase work of this project, was proceeded by selecting one class of the daytime graduate school. The researcher collected target market and trend, domestic and overseas buyer and circulation network information together with total of four researchers(two graduate school students, one graduate who work in H corporation, the leading agency, and one graduate who work in Ha corporation, the participant corporation). Accordingly, STPD strategy and 5P strategy through the cooperation with fashion related organization and participant agency was established. Then the direction of design through the working level consultation with the leading agency, H corporation and the participant agency, Ha corporation was presented. Afterwards, graduate school students and graduates who work in each agency(working level of each area) were selected as assistants who were placed into undergraduate class to teach the related information to the

undergraduate students to make them recognize the related information.

Next, a total of more than 300 graphic art and textile design DBs were created from one subject of undergraduate course(a total 30 students). Among them, three students were selected and provided an opportunity of gaining internship experiences to participate in the production process of the actual test products in H corporation, the leading agency, during the winter vacation period, along with scholarship.

The researcher undertook the whole research work by proceeding handling and research exchange with the leading agency, H corporation, and the participant agency, Ha corporation.

5. 3. Lecture plan

(1) Graduate school class: Information analysis and strategy establishment, establishment of direction of design.

- 1st week: Subject orientation > understanding about the project
- 2nd week: Case introduction of work process of other(他) academic-industrial collaboration project
- 3rd week: Target market analysis
- 4th week: Trend analysis
- 5th week: Establishment of the information of domestic and overseas buyers and circulation net (cooperation with related organizations)
- 6th week: Visit to the company (leading agency H and participant agency Ha)
- 7th week: STPD strategy establishment 1
- 8th week: STPD strategy establishment 2 (working level consultation)
- 9th week: Art marketing strategy establishment
- 10th week: Consumer questionnaire survey
- 11th week: Consumer questionnaire survey (field trip)
- 12th week: Result analysis of consumer questionnaire survey
- 13th week: Establishment of direction of design (corporate consultation)
- 14th week: Establishment of direction of design and product group
- 15th week: End of curriculum

(2) Undergraduate class: Development of textile design and lifestyle design products(Participants of graduate students and working level of leading agency and participant corporations as TA).

- 1st week: Subject orientation > understanding about project
- 2nd week: Case introduction of work process of other(他) academic-industrial cooperation project
- 3rd week: What is lifestyle design?
- 4th week: Case of textile design extension of global lifestyle design brand
- 5th week: Textile design trend and repeat arrangement method
- 6th week: In-depth study of repeat arrangement method
- 7th week: Field trip of participant agency Ha (printing and DTP process)
- 8th week: Everland field trip - Observing the animals and plants to be applied to family type lifestyle product group and proceeding individual textile design by taking them as motif
- 9th week: Development of graphic art and textile design 1 (concept development)
- 10th week: Development of graphic art and textile design 2 (intensification and

confirmation)

- 11th week: Development of graphic art and textile design 3 (DTP progress)
- 12th week: Test product design (DTP + product design)
- 13th week: Test product production 1 (individual student)
- 14th week: Test product production 2 (corporation feedback)
- 15th week: Presentation of final portfolio, selection of scholarship students and internship students, end of curriculum
- After 16th week (summer vacation): Additional progress of test product production and commercialization

5. 4. Process and output of academic-industrial project based on the lecture plan

The result of Capstone design class implemented by this government-aided academic-industrial collaboration project can be largely divided into information analysis, strategy establishment, design and product development, expansion of PR and sales route, evaluation certificate, and procurement of intellectual property. The result thereof is in <Table 2,3>, as follows, and the representative case is in <Figure 1~4>, as follows.



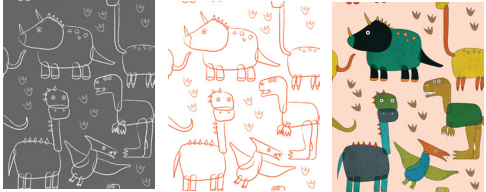
Table 2 Capstone design class curriculum

1	Information analysis	Target market analysis	<ul style="list-style-type: none"> - General state : geography, politics, economy, culture, etc. - Economic state : trend of import/export, Trade state, etc. - Market characteristics, price trend, circulation structure, etc. 	Academy (Graduate school)
		Trend analysis	<ul style="list-style-type: none"> - Analysis of world living design trend (2014 S/S, F/W) - Analysis of world miscellaneous items trend (2014 F/W) - Analysis of color trend색(2014 S/S, F/W) 	
		Collection of information of domestic and overseas buyer and circulation net	<ul style="list-style-type: none"> - Procurement of the list of circulation buyer, department store, showroom 	
2	STPD strategy establishment	<ul style="list-style-type: none"> - Market Segmentation strategy - Customer (Targeting strategy) - Positioning strategy - Differentiation strategy - SWOT analysis 	Academy (Graduate school)	
3	Establishment of art marketing strategy	<ul style="list-style-type: none"> - Product strategy - Pricing strategy - Distribution strategy(Place)- multi-shop, department store - Promotion strategy- exhibition, advertisement 	Industry1, Industry2, Academy (Graduate school)	
4	Development of graphic art and textile design	- Graphic art design development : 50 cases	Industry1, Industry2, Academy (Undergraduate school)	
		- Textile design development : 20 cases		
		- Acquisition of color database : 1 case		
		- DTP test product production : 30 cases		

5	Development of lifestyle living design	- Concept derivation	Industry1, Academy (Undergraduate school)
		- Pattern development : 20 cases	
		- Fashion item design development : 30 cases	
		- Home&living product design development : 20 cases	
		- Stationery design development : 15 cases	
		- Test product production : 30 cases	
6	Expansion of PR and sales route	- Commercialization : 30 cases	
		- Overseas exhibition participation : 2 cases	
		- Photo shooting and production	
		- Advance into new market : over 5 cases	
7	Evaluation certificate and acquisition of intellectual property	- Management of exclusive homepage for export : 1 case	
		- Design related design registration/application : 20 cases	
		- Laundry/friction/dry-cleaning fastness related evaluation certificate : 3 cases	
8	Employment, internship, scholarship	- Presentation of thesis : 3 cases	
		- Employment 3 persons (2 in the leading agency, H corporation, and 1 in the participant agency, Ha corporation from the graduates)	
		- Internship 5 persons	
		- Scholarship 5 students	

Based on the curriculum as shown in <Table 2>, students were required to develop graphic art and textile designs that are suitable for the family environment. Students were allowed to select their own concept and method of development. Example outputs of students' graphic arts and textiles designs are as follows in <Table 3>.

Table 3 Example outputs of students' graphic arts and textile designs

Concept	Method	Patterns
Metamorphosis	Paint, collage, Illustrator and Photoshop	
Dust monsters	Illustrator and Photoshop	
Dinosaur	Hand sketch, Illustrator and Photoshop	

Animals	Illustrator and Photoshop	
Robots	Hand sketch, Illustrator and Photoshop	
Polka Dots	Paint, Collage, Illustrator and Photoshop	

Such developed graphic patterns were then printed onto high-quality fabrics using DTP in order to develop various lifestyle design products categorized as follows in <Table 4>. Fashion items include women's wear, men's wear, children's clothes, and other items suitable for the whole family, along with accessories such as clutch, bags, scarf, etc. Home and living goods include various fabric items such as chair, cushion, beddings, apron, etc., and also non-fabric items such as stationary and office items that are based on the developed patterns.

Table 4 Life style design product categories

Fashion items	Home & living goods	fabric
Women's wear Men's wear, Children's clothes Family type pajamas, Inner wrapper. Outer wrapper, etc.	Family type clutch, eco bag, scarf, etc.	chair, cushion, oxford 10s 3-layer, oxford 30s, organic beddings (pillow, blanket), mug cup, apron, stationary, etc.

Based on the lifestyle design products categorized above on <Table 4>, students applied one graphic pattern to various lifestyle products to create a collection of pattern series. Example outputs of lifestyle products in application of graphic arts are as follows in <Table 5>.

Pattern Lifestyle product

Table 5 Example outputs of lifestyle products in application of graphic arts

Pattern	Lifestyle product

Other example outputs from different product categories are as follows in <Table 6>.

Table 6 Example outputs of lifestyle design products in different categories

Category	Products
Fashion	

Home & Living



Stationary



5. 5. Results and findings of capstone design class based on academic-industrial collaboration project

As mentioned on <Table 2>, the result of one-year government-supported academic-industrial collaboration project is focused on the tangible effects based on the quantitative objectives of the project. However, the results of Capstone design class in the perspective of students, instructors, and industries have been seen as a process of producing tangible/intangible effects as well as mid-term/long-term effects.

First, based on the results of the academic-industrial collaborative Capstone design class aided by the government, students were satisfied with the process of applying basic design skills in researching, strategic planning, designing, and developing, while also experiencing the integrated process of the industries' certification, intellectual property, and portfolio. Also, students were able to develop strategic planning skills through the process of gaining consumer and expert feedbacks of the developed products.

Based on the process above, developed products and brands were exhibited as products for Company H and Company Ha in various exhibitions such as Maison & Objet in Paris, Salone Del Mobile in Milan, 2013 Preview in Seoul, and other exhibitions that could contribute in the promotion of the products and brands. In addition, through the exporting of products in Company H's showroom located throughout the world, students were provided with scholarships and internship opportunities in return of developing more products. Also, by providing information on trading processes that are controlled by price, material, etc., students were motivated to learning effectively and actively.

Second, the Capstone design class based on academic-industrial collaboration project provided instructors an opportunity to proceed deeper curriculums with practical lessons that are not limited to workforce and budget. Also, the collaboration between Company H and Company Ha provided a foundation in studying and researching different design fields.

Third, industries were able to save costs on human resources for developing brand launching strategies from market analysis, STPD strategy planning, marketing strategy planning, to the

development of lifestyle design products based on graphic design and textile design.

Ultimately, the following outcomes of Capstone design class based on academic-industrial collaboration project contain both tangible and intangible effects in that it enhances learning efficiency while generates revenues.

The key strategy for the Capstone design class in the last semester of the year 2014 is to continue updating of the products as well as expanding of the win-win structure due to the generation of revenues. For this, fashion export company 'H' and graphic design firm 'S', along with dye/printing company 'Ha' is in preparation for proceeding Capstone design class focused on the development of additional products.

6. Commercialization progress plan for development object products and ripple effect

Based on the above output of government-aided academic-industrial collaboration, current commercialization progress state, strategy and henceforth plan up to June, 2014, promoted by the leading agency H and participant agency Ha are as follows.

6. 1. Brand concept and target market

On May 31, 2014, government support has been terminated, at the same time with this, a global lifestyle brand was launched, which was lead by the leading agency H corporation and of which structure is of cooperation and coexistence between total three agencies(visual design professional corporation S, participant agency Ha, and academy where the researcher belongs to).

(1) Brand name: Kaiserin Design Group

(2) Target market: Targeting the lifestyle design market of the Americas by gaining a foothold of the newly industrialized countries, e.g. China, Vietnam, Russia, etc., domestic and overseas market share plan and production plan is in Table 7 as follows.

Table 7 Production plan

Division		2015 1 year after termination of development	2016 2 years after termination of development	2017 3 years after termination of development
domestic	market share(%)	▪	10(%)	30(%)
	sales amount (unit: suit)	▪	100,000	500,000
	selling price(won)	▪	200,000	250,000
	domestic sales amount (million won)	▪	20,000	125,000
overseas	market share(%)	3 (%)	5 (%)	7 (%)
	sales amount (unit: ea)	50,000	100,000	500,000
	selling price(\$)	180(FOB)	200(FOB)	250(FOB)
	overseas sales amount(million\$)	9,000,000	20,000,000	125,000,000

- The brand is arranged to be operated as online/offline stores in the domestic market, while in the overseas, OMS in China and online operations based on 3B strategy(Best Quality, Best Design, Best Price) are planned.
- Object kinds of gift card: no. 3 type, no. 21 type, no. 24 type, no. 27 type, no. 28 type, no. 40 type, no. 42 type (Registration and acquisition of design service industry besides nominated product types)
- Brand slogan:
 - Global Fashion, Graphic, Product Designers get together and get inspiration about the life and design of different culture each other.
 - Healthy and happy life to share with family. Which is the heart of Kaiserin Design Group.
- Brand concept: Targeting 'family', presenting textile design with the concept of fun, humorous, colorful, applying and developing them to the various products group, eg. upholstery, toddler&children's clothes, family wear, bags, table napkin, stationery, bath products, kitchen utensils, dish ware, etc.

7. Conclusion

This research suggested 'Korea initiative(發) global lifestyle design brand launching by applying graphic textile' as the counter measure to overcome the slowdown of Korean textile/design export markets due to the loss of price competitiveness in global competition era. Also, so, in order to research and suggest a positive academic-industrial case which launched global lifestyle brand by utilizing Capstone design class, a new curriculum related to academic-industrial collaboration of 'lifestyle product development utilizing high-sensitive graphic art and high quality digital textile print(DTP)' was proceeded. The government-aided project proceeded as a part of global professional technology-development business funded by the 'Ministry of Industry, Trade, and Energy', and 'Korea Institute of Industrial Technology Evaluation and Management', for one year from May, 2013 to May, 2014. Also, the content related to commercialization after the termination of government support was suggested.

Based on the outcomes of the Capstone design class, positive structures of academic-industrial cooperation that satisfy the learners, instructors, and the industries were established along with the ongoing research and development in the future.

The anticipation of the ripple effect by the output of government-aided academic-industrial collaboration project research in technical aspect, economic/industrial aspect, and social aspect is as follows.

First, the results in technical aspect are as follows. Design contains the characteristic of being a knowledge-intensive high-valued industry that does not require much investment costs and have quick payback period when compared to the development of technologies. Accordingly, it is considered that the application of graphic designs in fashion, home, living, and stationary products, and the development of related products will contribute in the enhancement of brand awareness as well as sales increase, eventually leading to becoming a global lifestyle design brand.

Second, the results in economic and industrial aspects are as follows.

The early stage of project was proceeded by government-supported funds; however, this case could be suggested as the representative case, since the project continued even when the government support period was terminated, and the industry and the academy launched a design brand in collaboration and promoted consistent commercialization to create outputs. Also, with the descending spread of product development through lifestyle design product development of high-prestige zone, increase of export and enhancement of national competitiveness through market share within global premium market along with the natural expansion of customer group are expected, also, sales increase of other goods and synergy effect such as sales increase of domestic participant corporations through enhanced brand awareness are expected.

Third, the results in social aspects are as follows.

It is considered that the creation of living design brand which surpasses Finnish brand Marimekko will establish a basis to enhancing global competitiveness as well as the developing brand image as a design power.

Also, in the aspect of the academy, the class will not only be focused on the development of products but will provide an opportunity for students to launch the developed products in the global markets, which a synergy effect thereof is expected to be created.

References

- 1 Doosan encyclopedia. (2014, April), Doopedia. Retrieved April 9, 2014, from <http://terms.naver.com/entry.nhn?docId=1086907&cid=40942&categoryId=31611>.
- 2 HanKyung. (2011, April). Retrieved May 25, from 2014. from <http://terms.naver.com/entry.nhn?docId=2066542&cid=2898&categoryId=2898>.
- 3 Kim, J. (2014, April). 백화점 '라이프스타일'로 2차 혁신 나선다 [Department Stores Lead to 2nd Innovation through 'Lifestyle']. *Fashion Insight*. Retrieved April 7, 2014, from <http://www.fi.co.kr/main/view.asp?SectionStr=Weekly&idx=46573&NewsDate=2014-04-07>.
- 4 Kim, S. (2014, February). 일본 패션유통, '라이프 스타일' 브랜드가 주도 ['Lifestyle' Brands Lead Japanese Fashion Distributors]. *Fashion Insight*. Retrieved April 7, 2014, from <http://www.fi.co.kr/main/view.asp?SectionStr=Market&SectionSub=&idx=46023>.
- 5 Lee, E. (2002). 기존 및 확장 브랜드의 텍스타일 패턴디자인 개발유형 비교 연구 -이태리 패션브랜드를 중심으로- [A Study on the Style of Textile Pattern Design Comparing Italian Fashion Brand and Its Extension Brand -Focus on Italian Fashion Brand-]. *Research Journal of the Costume Culture*, 10(2), 146-159.
- 6 Min, D. (2014, April). 패션 매대 옆 스파게티, "라이프스타일을 판다" [Spaghetti Next to Fashion Display Stand 'Sells Lifestyle']. *Money Today*. Retrieved April 1, 2014, from <http://www.mt.co.kr/view/mtview.php?type=1&no=2014033115321830191&outlink=1>.
- 7 Ministry of Education and Science and Technology(MEST). (2010). The key terms of industry-academic collaboration fostering business.
- 8 Park, M. (2013). 새 정부 산학협력 정책의 발전 및 검토 [Improvement and Examination for the New Government Industrial-Academic Cooperation Policy]. *Proceedings of Dissertations for the Spring Conference* (pp. 797-814). The Korean Association for Policy Studies.
- 9 Park, S. (2013. March 22). 상하이텍스 2013, 텍스타일 프린팅의 뉴 트렌드 창조 [Shang-hai 2013 creates new trend for textile printing]. *Fashion Journal*. Retrieved April 1, 2014, from <http://okfashion.co.kr/detail.php?number=27146&thread=81r19>.
- 10 Ryu, Y., & Choi, S. (2011). 정부지원 산학협력의 성공요인 [Success Factors of Government-Funded Industrial-Academic Cooperation]. *Korean Public Management Review*, 25(4), 25-52.
- 11 Shin, J. (2002). *날염기술(捺染技術) [Textile printing techniques]*. Seoul: Hyungseul.

