

Study on the Development of Public Bench Design for Campus¹

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ABSTRACT

Recent tendency in modern society for urban design and public space forming it recommended diversity of studies and design development, for the interest in urban design is increasing. In particular, street furniture being one of the important components to construct public space has been researched and developed in aspects of formative and emotional style, broken from the old way of the function-oriented purpose. It could be said that this results from the desire of human pursuing a well-off life, the new value standard regarding design and the life styles in mode.

The new development of street furniture could be a creating the value-added source potentially being able to raise community, identity of nation and international competitiveness, beyond the primary purpose, namely the improvement of surrounding environment, and therefore the most of countries in the world are concentrating their life and death on development of design in reality.

For this investigation the concept of city design, the basic content analysis of the street furniture and also the contents in the related sectors were reported. In order to develop the bench design, one of the representative items of the street furniture furthermore it was proceeded that basic process for the design like data searching for the object place and the existing case studies. On the basis of this the series of the design development processes such as idea sketch, computer rendering and drawing work were described step by step. The aim of this study is therefore to contribute in compiling the development processes of bench design as a new shape into a data and in utilizing it as a design case study and research material in the related sectors.

Key words: *Street furniture, Bench design, Urban Design, Public space design.*

1. Introduction

Since modern civilization had been found, the study and development of urban design have been constantly carried out still up to now. The tempo of development and study regarding public space however is not as dynamic as structures, buildings and dwellings, but the full change of study and development regarding this has been conducted first recently while the new light shedding on the role and function of public space. It results from the human desire pursuing the wealthy and better life-quality based on the development of material civilization and high lift standard accordingly, and this tendency is stimulated more and more by the new lift styles e.g. like well-being and LOHAS in mode.

The research of such new possibilities have been proceeded with the beginning of the 21st century and the majority of urban design theorists mentioned that the space itself and also the portion and function of the elements making up for the space are really important at discussing of the life-quality in consideration of residential environment in city. Street furniture in particular, one

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of the elements constructing public space is regarded as the most meaningful items among many other elements. It is no doubt that street furniture plays a leading role to make our life environment more frequently, agreeably and comfortably. The well positioned arrangement of bench, street furniture and shelter can make public space of city easily accessible and the positive aspects can be encouraged hereupon and the relation between user and space is advanced accordingly. Furthermore the proper development of street furniture could be a really meaningful keyword to firm the social links among neighborhoods reliably.

In the course of the introduction of globalization it is the big issue all over the world to raise the status as the unique and characterized city, to improve the competitiveness by establishing a new identity and finally to create the added value tangible as well as intangible. For that many countries are attempting to develop the environmental design of city and also street furniture constructing the city environment. Korea is also no exception to this wave and is giving many efforts to raise it's competitiveness, but there are a lot of insufficient points. So, it is absolutely necessary to make a breakthrough by diversifying the development of street furniture being harmonized with surrounding environment and conditions.

1-1 Scope and Method

Intention of the present study was to realize the differential spaces for special places and/or the community through developing the design of street furniture being one of the construction elements for urban design. It is recommended indeed at developing of street furniture design to carry out different studies for many items. However, it is so widely various and has different limitations to handle all available items, so in this study bench design being able to represent street furniture should be mainly described. Furthermore the sector of the present study should be spread to the specialized bench design for the improvement of campus environment, and the more efficient and the in-depth study for results expected.

The study was conducted by referring to sundry records and internet searching for the basic data investigation and the current status of the object place was researched. The survey, analysis and research of the preceding designs of bench should crate the definite design direction. After the design orientation and concept was crated first of all and then idea sketch, modeling and 3D rendering determined the design, and 3D simulation & drawing fixed the final result. So, the aim of the present investigation is summarize basic information regarding street furniture, to satisfy the needs of customer and to present the right direction of design process for development of design combining functional, formative and aesthetic aspects.

2. Concept of Urban Design and Facility of Street Environment

2-1 Concept of Urban Design

Urban design can be defined as a planning act to make a shape and system synthetically the physical space of city targeting the attractive, comfortable and functional design of city, and as the medial constructive idea between the city plan as a system and the personal space realizing the environment based on space sense of human living actually in city space, and as a harmonizing act of creation between the life and space, and as an act to make an unique space according to the characteristics of place and even as program to include the non- physical environment, namely different presentations and events recently (Korea Institute of Design Promotion 2005).

The recommended urban design development means the utilization of the potential value of city resources such as environment, history, culture, living and tourist heritage and so on. in various ways, and the recycling of these as a new city resource in new version and the creation of the

identity of city differentiated from the other cities. Beside this it can lead to the comfortableness of city thanks to the image improvement and induce “urban amenity” to vitalize local economy by encouraging the pride of citizen and remaining a good impression for the outsider. (Urban Amenity : Attraction of human feeling to environment and it was introduced in the early 20th century in middle of England as a principal of city plan. In Japan it was introduced in the 1960s, and Korea accepted this concept of urban amenity through Japan (Lee 2007). For this it should be seriously regarded that the exact understanding as to the characteristic of city and the network system among the city resources presenting different themes are the core issues, and the development of the standardized design manual is necessary for the stable maintenance.

2-2 Street Furniture

At discussing city environment street furniture are often mentioned and this term of street furniture was used as a meaning ‘furniture on the street’ in England, and streetscape, sight furniture, urban furniture or urban element are said too.

Street furniture was based on the recognition of convenience for the pedestrians and understood as a concept and different ways of the environmental installation of the pedestrians, but ultimately it might be an ‘instrument’ to maintain and operate the outdoor life. Therefore it is an essential factor for the business of city environment design, if it would be classified in city plan or administrative business. Most of countries in the world recently are emphasizing the efficiency by developing different theories and publishing the related casebook and they are trying to give a cultural value to the entire city besides of strengthening the competitiveness and to create the new social value and capitalization furthermore.

Table 1. Classification of street furniture for urban environment according to the user Table (Lee et al 2008)

Object	Functional classification	Examples of facilities
Vehicle	Traffic safety	Signal flag, traffic sign
	Traffic support	Parking meter, streetlight
	The others	direction board, traffic info board
Pedestrian	Traffic safety	Traffic sign, bollard, guardrail
	Traffic support	Bus stop, taxi stop, bike stop
	Information	Direction board, lead sign, signal, bulletin board, watch, sign board, advertisement
	City service	Public telephone booth and stand, post
	Hygiene	Wastebasket, water fountain
	Resting place	Bench, chair, table, shelter, awning
	Purchase	Kiosk, vending machine
Water environment	Sculpture, monument, fountain, flag, flower box, planter, street trees and garden	

Street furniture are classified in the facility for the pedestrians and for the vehicles according to the users as shown in the table 1. For the pedestrian the facilities are presented like those of traffic safety, traffic support, information, city service, hygiene, resting place, healthy environment, purchase, water environment, and for the vehicles like traffic safety equipment, traffic support equipment and the others. Besides this there are the classification systems according to the function

based on human manner (in England and Germany), the value of space and information and time (in Japan) and government and public offices administrating the facilities of city. The systems to classify the facilities of city environment can be differently sorted by the view of interpretation or the standpoint, but the standardized sorting way does not exist yet. Therefore it would be highly needed today the comprehensive perspective and all-inclusive view exceeding the existing diverse classifications of city facilities.

3. Development of Bench Design

Aforementioned this study intends to describe the design process of bench design in particular placed in campus and playing a link-role between user and space. The reason why bench was selected as the object of study is that it is the most contactable item among street furniture during the daily life directly and/or indirectly, and at the same time one of the useful elements forming various location and space. The reason of selection of campus as the object is the characteristic of the community that the members using this space are in the similar age group and show also similar pattern of behavior and their staying time in campus in common is relatively long, and therefore this is an advantage for researcher to understand the needs of members intensively and to develop a specialized design more easily compared to other public space. The development of design was conducted according to the procedure of the searching of information, creation of design direction and concept, idea sketch and computer rendering.

3-1 Design Background

The main purpose of this study is to design a bench for Seoil University to make a good environmental feature on the Seoil campus and to develop a new image for the school. Also, it must harmonize with campus buildings, and it must be a good place where past, present, and future exist for students to enhance their imagination and pride in their school.

3-2 Objective

- To replace the existing benches
- To design a bench that successfully meets the needs of users
- To design a bench that harmoniously integrates with the institute's architecture
- To design a bench that will have longevity with respect to lasting design style and fashions
- To be efficient with materials and respect the integrity of the campus grounds
- To design a sturdy bench that will weather well over time in design and material
- To be economical in developing a bench that will not require costly maintenance

3-3 Research

In the phase of the information searching the function and design of bench in one side and market and user demand in other side were investigated. In part of function and design the material regarding the mainly used for bench such as metal, wood and glass and so on, the standardized module of bench, the analysis of the production processes, the durability study and the current status of design were presented. In part of market and user demand the information were investigated in terms of the analysis of current market and products, the raise of user-demand and problem, the survey and the image analysis of campus (Refer to the table 2.).

Table 2. Classification of information for research

Function / Design	Market / User Demand
<ul style="list-style-type: none"> - Study of steel, wood and glass - Check module - Analyze making process - Prevent from warping and breaking - Current design (Seat, Back seat, Body and so on.) 	<ul style="list-style-type: none"> - Find current market and product - Find user needs and problem - Conduct durable plan - Survey user's needs - Check some factors for installing -Analyze image of campus

The current market analyzed by the investigation consists of mainly reproduction of old style, limited style and materials and mass production focusing on cost down. As for the color dark and unclear tendency were dominant, but they lacked a satisfied feeling. It could result from the small scale of market, the petty manufacturer and the lack of the design-oriented mind and so on.

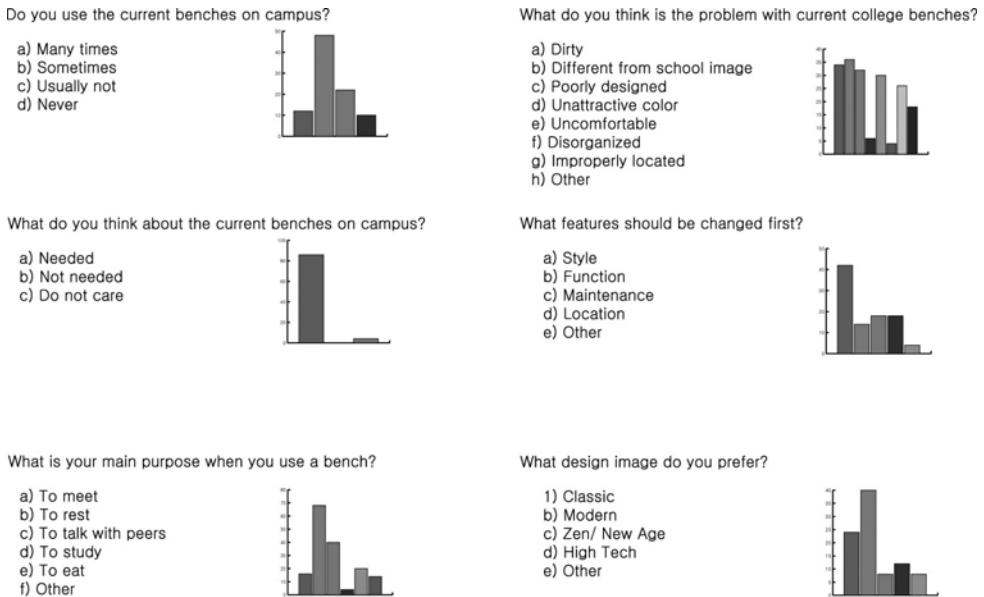


Fig. 1. Analysis of survey.

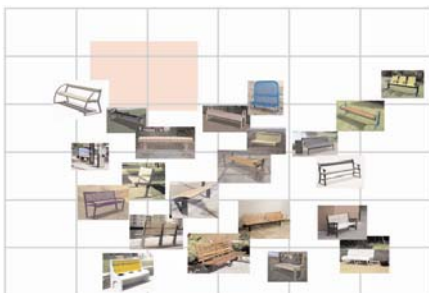


Fig. 2. Image map of current design 1.



Fig. 3. Image map of current design 2.

The result of the study on the arrangement and using pattern of bench in Seoil campus as the object of the study based on the on-site investigation, the photo shoot the survey pointed out the mismatch between the installed bench and the image of Seoil University, the inappropriate location, the poor design and the unattractive color and uncomfortable use and so on. Moreover there were many cases to disturb the landscape of campus, because the management for the maintenance problems was not considered at all. The lack of the space design plan in campus in consideration of the development and installation of the suitable products and also the lack of continuous and efficient maintenance are very probably the reasons for the unsatisfied result. On the basis of the data investigation and analysis the problematic questions were diagnosed and the study on the design orientation to solve the problems was presented.

3-4 Design Concept

Design concept based on the selected design generally was created. New bench design concepts are as follow :

- Design should correspond with Seoil's image
- Needs to a landmark on campus
- Identify with past benches
- Supply a resting place for students and enhance their pride and love for school
- Harmonize with campus

3-5 Design Development

Development of design followed the process of idea sketch, concept sketch, marker rendering and modeling in order to decide the design and CAD drawing and 3D rendering completed the design simulation. In the process of idea development the efforts to harmonize the selected direction of design with the related place and to make the characterized design as the same time were conducted. Formative and amusement aspects especially were stressed here to improve the environment of campus and also to encourage the students in feeling their pride and creativeness.

The definitely selected design has the basic module that 2 table and back of the bench make the basic unit and are diagonally connected. The crossing point of this basic unit has one leg in common and this means that the members should share their weak points and cover them each other and have a steady relation. This basic unit is available to be designed in different numbers and forms and can be easily maintained thanks to the square-shaped continuing structure and is durable too. The rector-linear styled bench can extend it's function as different as possible with the help of the attachment of cup holder and other accessories and it is changeable through the various coloring plans. The modern aspect was emphasized by the painting after stainless steel process and the main material can be differently used e.g. real wood or mold cast according to each environment.

3-6 CAD Drawing and 3D Rendering

The definitely selected design was worked by AutoCAD and 3DS Max program and also by the design drawing and 3D rendering simulation.



Fig. 5. CAD drawing, 3D rendering and simulation.

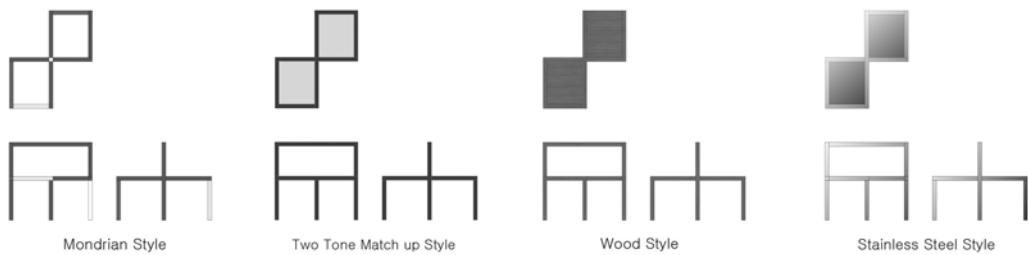


Fig. 6. Color and material variations.



Fig. 7. Design configurations.

4. Conclusion

The modern society where different culture and history coexist is faced with the study on the development of the value and function of public space catching up with new life style and this is the question that should be constantly tried for its' solution. Research on the development of street furniture in particular, one of the important elements constructing public space can be said as an essential factor to offer a wealthy and prosperous human life.

The research on bench design for campus handled in this study should be regarded as a very important and valuable process, if it would be a part of the basic processes for the aforementioned. On the basis of such series processes street design, public design and also urban design are expected to be completed at the higher level. The remarkable points of bench design for campus are as below :

First, the basic module is changeable differently because it consist of two seat board having one leg in common. Thanks to this the characteristic (originality) and differentiation of identity could be freely expressed for the campus community.

Second, not only the formative and aesthetic point, also functional aspect are stressed at designing. The rector-linear style to which modern and simple design was applied might accord with the image of university and furthermore harmonize with the surrounding environment. To increase the efficiency of utilization also diverse material and finishing are available for the practical application.

Third, the durability and easy maintenance were considered thanks to the simple and structurally perfect design and also the attachment of different accessories according to the user's taste is here available at the same time.

And lastly, the specially designed sculpture was pursued to be able to represent the landmark bench of the object place, campus and to harmonize the surrounding environment well. The design suggestion in terms of the formative approach to the small & narrow and featureless campus in particular could be expected to play a role as a new medium to integrate the user into the related environment.

The aim of the present study was to suggest the bench design keeping pace with the new period, to differentiate the existing products and to lay the foundation for the possibility of new design development. This should include the meaningful opportunity to present the important and valuable case study on the specialized design development for each class and space. The living space of the contemporaries is closely associated with street furniture and the study and different design development regarding this lead the convenience and quality of our life to the higher standard, and it should be an important keyword to increase the competitiveness without any doubt.

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