



The Educational Strategies of Citizens' Identification and Recognition for Sustainable Urban Development in Taipei

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Creating an attractive cityscape has become one of the most promising actions to improve urban functionality and increase urban competitiveness. However, the resistances from the local inhabitants are always against the urban development. Taipei City, a metropolis in Taiwan, is now composed of complex urban systems chaotically enclosed by existing and new urban environments. The city government is attempting to re-shape its cityscape by implementing a series of city regeneration plans, namely "Taipei Beautiful", considering the improvement of urban landscape, greenery open space, built environment, sustainable campuses and public facilities. These actions represent how Taipei city government educates its citizens toward to identify and recognize the benefits from the developments. Although Taipei Beautiful is an ongoing project, achievements of the current stage have revealed potentials to significantly increase the number of tourists, decrease energy consumption, and promote economic benefits. This study presents an overall review of educational strategies and actions enacted by the city government. Difficulties, challenges, and the role of the city government in affecting inhabitants' identification and recognition are also discussed. Lessons learned in Taipei City could be useful for other cities that are facing similar city development requirements.

Keywords: educational strategy, architectural education, citizen's identification and recognition, sustainable urban development.

INTRODUCTION

Taipei City, the political, economic, and cultural center of Taiwan, has become one of the most international and modern cities in Asia. This city is densely populated with a population of more than 2,600,000. In 2010, the population density ranks no.7 among world metropolitan areas. However, the speed of development for creating comfortable urban infrastructure and environment has

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not caught up with the speed of population increase. The major development resistant is coming from the local inhabitants due to believe of development will damage the current benefits and economic environments. Similar problems also occur in many rapidly developing countries (Firman, 2000). In the city of Taipei; more than 30% of the buildings were constructed before 1980, and there are 290,000 residence units currently in these buildings (as web site, URO, TCGO, 2013). Complex and mixed urban environments have severely affected the urban habitability, functionality, and competitiveness (Wu, 2007; Yigitcanlar, Connor & Westerman, 2008; as web site, TBP, TCGO, 2013).

Renewal, or regeneration, is the best way to solve deterioration of the urban function, promote land values, and improve environmental quality (Adams & Hastings, 2001). However, urban regeneration projects are often annoyingly surrounded by many social and economic problems (Myllylä&Kuvaja, 2005), such as destruction of existing social networks, evaluation of policy development, expulsion of vulnerable groups, and adverse impacts on the living environment (Chan & Yung, 2004). With the intervention of the public sector, urban regeneration can be effectively implemented (Juan, Gao & Wang, 2010).

Hence, to educate the local habitats and gain their identification and recognition on the development is the most important matter to solve, Taipei city government came out with a series of developments plan focus on educate the local inhabitants toward to the recognition to the sustainable urban developments. The first step is to understand what the local habitants' knowledge on the matters is. For example, as it is the case of Fukushima. A profound understanding of different aspects of radiation, thus, seems to be essential for all citizens. This is why we were interested in examining the students' conceptual understanding regarding this topic. (Neumann & Hopf, 2013.) After the understanding from the both side of government and the citizens, the strategies of the policies will be more efficient. To prepare the city for the 2009 Taipei Deaflympics and the Taipei 2010 International Flora Expo, the Taipei City Government (TCG) decided to initiate a series of urban regeneration projects in 2008, namely "Taipei Beautiful", to improve the cityscape and urban environment (as web site, TCRD, URO, 2008). Under the framework of Taipei Beautiful, eight action plans, summarized as follows, are defined.

- *Establish floor-area-ratio (FAR) incentives to encourage property owners to create more open green spaces in urban environments.*

State of the literature

- Complex and mixed urban environments have severely affected the urban habitability, functionality, and competitiveness.
- Urban regeneration projects are often annoyingly surrounded by many social and economic problems; these cause the resistance from the local habitants.
- Renewal, or regeneration, is the best way to solve deterioration of the urban function, promote land values, and improve environmental quality.

Contribution of this paper to the literature

- Educate citizens' identification and recognition is necessary for sustainable urban developments. By reveal potentials to significantly increase the number of tourists, decrease energy consumption, and promote economic benefits with the achievements of re-shape the cityscape should be implemented to the urban regeneration plans.
- Apply architectural education into the sustainable urban planning can be formulated as a series of urban regeneration projects action which can be helpful for citizens to comprehend and understand the importance of reshape the cityscape in the short term and improve urban competitiveness, renovation if industries and revival local economy, in the long term.
- The proper educational strategies can promote the urban development of cultural and creative industries. The perceiving of benefits to the urban habitants is very much needed for a successful sustainable urban development. The results identified that local government should earn the trust and cooperation from its citizens by introducing the educational strategies into its urban development plans. Most importantly, the results can provide architecture and urban planning related fields' students and experts for the future applications

- *Establish floor-area-ratio (FAR) incentives and property tax waiver mechanisms for property owners to renovate obsolescent buildings.*
- *Establish appropriate subsidies for cleaning buildings, refurbishing specific building facades, and improving streetscapes.*
- *Establish appropriate subsidies for redesigning commercial signboards in areas where the 2009 Taipei Deaflympics and the Taipei 2010 International Flora Expo events will occur.*
- *Allocate budget to build eco-wall systems and green fences for educational facilities.*
- *Enact greenery plans for idle urban land and unused spaces.*
- *Improve lighting systems for historical buildings and major urban attractions.*
- *Utilize public artworks to beautify selected public buildings.*

The aim of this study is to examine the implementation of these developments policies for making Taipei City more beautiful and attractive that will appreciate the local inhabitants. And the citizens will receive the benefits from the developments; also with a specific focus on cityscape improvement. The outcomes and lessons learned will also be discussed.

CURRENT CITY DEVELOPMENT PROBLEMS

Taipei City has experienced three stages of urban development to form the basic urban framework: the Colonial Period (from 1895 to 1945), the Post-Second-World-War Period (from 1946 to 1960), and the Important National Infrastructure Plan Period (from 1970 to 1990). Today, Taipei City has become one of the most international, modern, and commercial cities of Asia; the existing built environments formed during these 3 periods are intermingled with new construction. And there are many new methods being provided to the similar complex matters worldwide today. Science education within the new STEAM framework used in Korea requires interdisciplinary approach across different disciplines, such as science, technology, engineering, arts, and mathematics to address the higher degree of complexity of contemporary problems (Especially in regards to the global warming.) (Jeong & Kim, 2014.) In some downtown areas, incongruity and deterioration have obstructed urban operations and caused many serious urban development problems (Juan, Gao & Wang, 2010). These problems are the cause of local inhabitants' doubts and resistances in order to remain the current status. The strategies of educational guidance need to be providing to the citizens with the new methods. Preliminary results show that guidance designed following the knowledge integration framework is more effective than guidance that emphasizes the right answer. (Linn, Eylon, Rafferty, & Vitale, 2015). To educate the local inhabitants to identify and recognize and in terms of sustainable city concepts, these problems can be described as follows.

Lack of Open and Green Space

Taipei City is located in a natural basin. Land usage and resources are very limited. In the early city development stage, the urban planning policies and zoning regulations were indistinct. In 2005, the government enacted regulations giving incentives to building owners. These acts were to ensure that citizens who applied for open space redevelopment and land usage grants and incentives were qualified for incentives and rewards (as web site, TCRD, URO, 2005). This incentive act

included 5 categories: 1. coordination with nearby dwellers including building colors, material, shapes and location; and building design as well. 2. Open spaces and public plazas. 3. Providing for pedestrians and sidewalks. 4. Historical buildings. 5. The scale of the redevelopment area must reach at least 3,000 square meters. (as web site, URI, TCGO, 2013).

Large Amount of Aged Buildings and Idle Lands

In Taiwan, more than 80% of total households own houses (Juan, Shih & Perng, 2006). However, many of these housing units are facing aging and degradation problems. In order areas of Taipei City, approximately 70% of the housing is over 20 years old. Going through the 3 stages of urban development, some parcels of land gradually lose their original functionality through the opening of markets, privatization of state-owned enterprises, and changes in social structures. These idle lands in downtown areas decrease the city's competitiveness in the long term since they obstruct the development of business activities and external investments (Wu & Barnes, 2008).

Ugly Urban Necessities

One of the major features of Taiwan urban building façades is the "iron window culture". According to statistics, more than 50% of buildings have installed iron grilles covering windows in order to achieve burglarproof status. However, most of these building owners do not make installation decisions considering environmental congruity and aesthetics. To improve this situation, the Taipei City government is planning to impose a tax on those buildings which detract from the scenic value of a neighborhood (as web site, TCG, TCGO, 2013).

Unclear Regional Characteristics and Architectural Styles

Cities are usually attractive and renowned for specific regional characteristics, cultures, and landscapes (Yigitcanlar, Connor & Westerman, 2008; Chang, Li & Chang, 2007). Due to the impact of colonization and localization, Taipei City has been famous for its diversity in respect to ethnicity, religion, political parties, culture, etc. However, as the society and economy have developed, the conservation of these historical heritages has usually been ignored (Alexander, 2005). Regional characteristics, such as the night market culture and ceremonies, deserve to be preserved (Al-Hathloul & Mughal, 1999).

EDUCATIONAL STRATEGIES'AND ACTION PLAN IMPLEMENTATION

The strategies of Taipei city government to educate the local inhabitants, private sectors and public sectors are introducing a project *Taipei Beautiful*. A series of urban regeneration projects has been implemented by the TCG to re-shape the cityscape. 8 action plans for cityscape re-shaping have been formulated to promote the development of cultural and creative industries and improve urban competitiveness. The public sector's direct intervention brings about a good opportunity to re-think the regeneration mechanism for built environments considering policies, efficiencies, incentives, and public welfare. These 8 action plans are demonstrated as follows.

Reshape City Landmarks and Open Spaces

To enhance aging buildings and communities, different FAR incentive schemes are offered by the TCG to encourage property owners to create more open, green spaces for urban environments (Nagashima, Sands, Whyte, Bilek&Nakagoshi, 2002). Property owners can acquire the incentives if their properties can show large open spaces (an area which reaches at least 0.1 hectare), pedestrians and bicycle trails, elevated platforms crossing over major traffic arteries or rivers, and spacious interior open spaces (where the ceiling height reaches at least 15 meters). Any site which covers a complete block or any site area which reaches 0.5 hectare has priority to apply for incentives. In addition, projects that can create water-friendly space, culturally innovative and sustainable environments, and attractive tourism spots are encouraged (Waley, 2005).

From February of 2008 to September of 2009, 41 out of 48 projects successfully applied for FAR incentives. 11 projects, including 6 regeneration projects and 5 redevelopment projects, have now been implemented by medium-sized and large-sized construction companies, respectively. It is worth mentioning that these 11 projects are all qualified for the Green Building Certification System of Taiwan. In terms of sustainability, these projects are expected to decrease, by half, the electricity, 1,600,000 KWH, consumed annually in Taipei and to prevent 30,500 tons of carbon dioxide emission annually after the project has been completed in 2012 (as web site, DUD, TCG, 2013; New Metropolitan Synergies, 2010). As for open space improvement, these projects have created pedestrian and bicycle trails of 2 kilometers, open spaces with total areas of 6.3 hectares, and skywalks with total length of 3.7 kilometers. Fig. 1 is an example demonstrating a reshaping of open space outside a building (Liang, Li, Wu & Yao, 2007; Burnett, 2007).

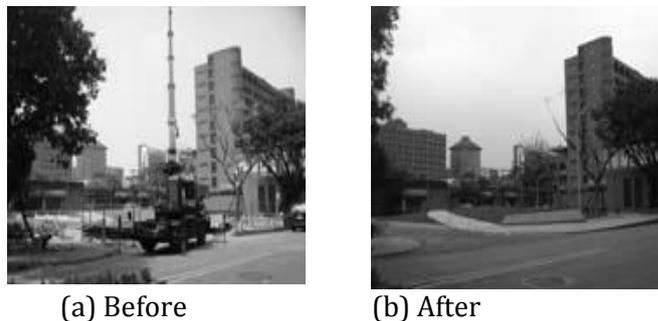


Figure 1. Reshaping of open space on Keelung Road

Renovate Obsolescent Environments: Demolishing and Landscaping

TCG has also released FAR incentives for property owners who are willing to actively demolish old or obsolescent buildings and then change them into green spaces. For example, if a building site is designed with at least 40% green coverage, the property owner can acquire 3-5% FAR incentives. A property tax waiver or tax reduction scheme will be also made available by TCG if the site is open for public use for at least 2 years. Some other sustainable concepts such as pavements with rain water percolation and native vegetation for green spaces are encouraged by the application review process.

From December of 2008 to August of 2009, 12 out of 20 projects which applied were approved. It is estimated that there will be total additional vegetation areas of 10 hectares in the year of 2010. Fig.2 is an example showing obsolescent buildings before and after landscaping.



(a) Before

(b) After

Figure 2. Renovate obsolescent environments: Keelung Road, Taipei

Clean and Refurbish Building Façades

TCG has appropriated 50-100% subsidies for projects to clean building façades, including cleaning of exterior walls, removal of illegal signboards, rearrangement of surrounding cables or wires, and removal of unsightly iron grilles outside the windows. In addition, partial funding ranging from 45-75% of each project is also provided for major building façade refurbishment. The aim of this action plan is to restore the original functions of building skins and upgrade the building envelope performance. In 2010, TCG has decided to appropriate US\$312,500 for cleaning building exterior walls and another US\$1,250,000 for refurbishing building façades.

From February of 2008 to August 2009, 3 out of 18 applications were approved for building exterior wall cleaning; 22 out of 57 applications were approved for building façade refurbishment. Fig. 3 is an example showing the building façade before and after refurbishment. In terms of the appearance aesthetics, the façade did get improved through the refurbishment.



(a) Before

(b) After

Figure 3. Building façades before and after refurbishment: Che-Qian Road, Taipei

Redesign Commercial Signboards

To improve the cityscape and to ensure energy consciousness and safety of commercial signboards in the Taipei City, TCG provides a simplified application review process and a cost reimbursement scheme for signboard redesign and replacement. Some pre-designed standard types of commercial signboard are also available for free reuse and applications that adopt these standard types can shorten the review process. A limited cost reimbursement of US\$600 is provided for each application case for signboard redesign; US\$1,200 is provided for users who are willing to adopt energy-saving LED lighting systems in their signboard design.

From February of 2008 to September of 2009, more than 700 signboards had been redesigned or replaced by standard signboard types. Another 773 signboards have been removed due to being unsightly and of illegal design. Fig. 4 presents an image of the streetscape of Jing-Fu Street before and after redesigning commercial signboards. The number of applications is increasing year-by-year and around 10% of the applications tend to adopt energy-saving LED lighting systems.

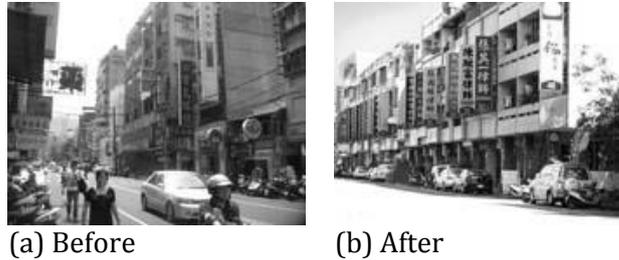


Figure 4. Commercial signboard before and after redesign: Jing-Fu Street, Taipei

Create Open Campuses and Green Fences

Campuses, as urban open spaces and ecological balance systems, are very precious within crowded Taipei city. A cost reimbursement scheme is offered by TCG to assist schools in removing solid concrete or brick fences around campuses. The aim of this action plan is to create friendly green fences, generate biological diversity for educational purposes, integrate street furniture with green fences, and connect green belts within the city.

During the school year of 2009-2010, 18 schools have been approved for cost reimbursement schemes to improve their fences and greenery. Fig. 5 is an example demonstrating an integrated street furniture and green fence project.

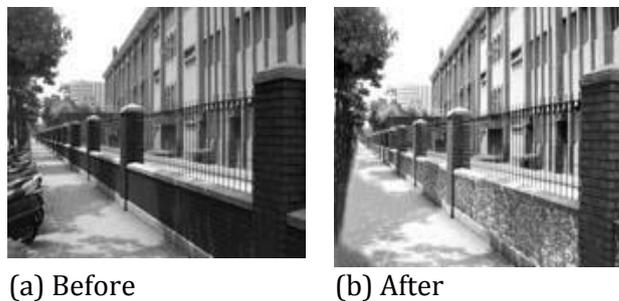


Figure 5. Campus fence before and after improvement

Renovate Idle Urban Sites

To welcome the upcoming *Taipei 2010 International Flora Expo*, TCG also set up a cost reimbursement scheme for vegetation planting or landscaping to encourage property owners in actively managing idle sites. Sites, including public and private lands, near important transport hubs, major roads and famous tourism spots have a priority to apply for subsidies. Renovating idle urban sites is not only beneficial in improving the cityscape but also helpful in decreasing potential crimes which occur in or on urban dead spots.

From February of 2008 to September of 2009, 17 idles sites were approved for renovation. 8 of them have been landscaped and opened to the public. An example, on Roosevelt Road, is shown in Fig. 6 to demonstrate the landscaping and vegetation implemented by this action plan.



(a) Before



(b) After

Figure 6. Idle urban sites before and after renovation: Roosevelt Road, Taipei,

Enchanting Urban Nightscapes

The nightscape is one of the most memorable impressions for many famous international cities. To provide better nightscapes and safer environments for evening activities, TCG has enacted a "Lighting Master Plan" to improve lighting systems on major bridges, pedestrian bridges, underpasses, wharfs, and the riverside parks, areas surrounding *Taipei 2010 International Flora Expo* sites, and historical and public buildings in the nighttime.

From February of 2008 to September of 2009, lighting systems have been installed for 17 focal sites and 10 historical and major public buildings. However, there is still a pressing demand to implement this plan at specific areas such as 18 riverside parks and 10 bicycle trails in the city. TCG expects to install these lighting systems in the next 3 years. A day view and nightscape of the Rainbow Bridge in Taipei city is an example to demonstrate a landmark tourist attraction venue for evening activities created by this action plan.

Beautify Public Environments with Artwork

In addition to cleaning and refurbishing building façades by traditional architect/engineer/contractor teams, artists are also invited to take a leading role in participating in creating new public environments through their artworks (Heide, Lardal & Gronhaug, 2007; Moropoulou, Tsiourva, Bisbikou, Tsantila, Biscontin, Longege, Groggia, Dalaklis & Petritaki, 2002). In early 2009, 4 public buildings, including one traditional market and 3 Administration Centers, were selected as pilot projects. Fig. 7 shows the traditional market before and after refurbishment by applying artworks on the building envelope. It is estimated that there are over 100,000 people passing by this area every day and nowadays people are experiencing this brand-new impression of the building envelope. Meanwhile, due to the combination of energy-saving technology and artwork, the energy consumption can be reduced by 15-30% after refurbishment (Kumar, Sachdeva & Kaushik, 2007; Spala, Bagiorgas, Assimakopoulos, Kalavrouziotis, Matthopoulos & Mihalakakou, 2008).



(a) Before



(b) After

Figure 7. The Su-Won Traditional market before and after refurbishment

DISCUSSION

Although the educational project of *Taipei Beautiful* is to re-shape interactive relationships among citizens, cityscape, and environments, how to arouse citizens' awareness of sustainable urban environments as well as encourage them to actively participate in improving their environments is more important. However, during the project implementation process, there were some doubts and complaints arising from the citizens. Local government usually spend large amount of money on development projects (Hsueh, Lee & Chen, 2009); instead of pouring the effort only from government, the educational strategy stands an important role to connect the citizens and government to work together. Therefore, difficulties, challenges, and the role of the TCG in affecting architectural education deserve to be considered and discussed.

The release of FAR incentives was overwhelmingly criticized by many government officials, councilors, and experts. The first action plan, different FAR incentive schemes to encourage property owners to create more open, green spaces for urban environments, was regarded as a policy implicitly beneficial for specific large-sized construction companies. For example, if companies are qualified to acquire 70% FAR incentives, they can make a high profit, around 90,000,000 US dollars for each project considering the current real estate situation in Taipei City. In this case, TCG could not avoid setting up some plans to control FAR incentives based on the project performance and schedule.

In the case of citizens, the policy of *Taipei Beautiful* facilitates an increase of real estate price in the short term, which provides many opportunities for speculators to energetically roll over real estate deals to make excessive profits. In the long term, this phenomenon tends to move towards an unhealthy real estate market and cause disputes about social justice. The attitude of the TCG seems to be optimistic since they treat this trend as a result of a liberal economy and supply-demand issues in the market which need more time to be clarified.

Due to FAR incentives for property owners, many councilors and experts also worry that it will be an "ecological catastrophe" in terms of urban sustainability since these large regeneration projects will continuously carry on for many years and more and more skyscrapers will appear in the near future. TCG has to pay more attention to the review of urban development planning to avoid abnormal application cases, such as immoderate heights of buildings which apply for FAR incentives, which may well occur.

Some historical and culturally significant buildings have been preserved by TCG due to the goals of *Taipei Beautiful*. However, many buildings that have not been registered as historical buildings were probably torn down even though the buildings could represent specific urban historical and cultural memories of a particular urban development period in history. The narrow minds of policymakers have destroyed some valuable buildings and their heritage. This has been criticized by many conservationists. This kind of issue is worthy of special attention by all participants in the future urban regeneration.

CONCLUSIONS AND SUGGESTIONS

Taipei City has been engaged in its urban development for 120 years. Because of limited available land, urban regeneration is one of the most important issues for the current urban development policy. Citizens in Taipei are starting to benefit from the developments and the perspectives of the local habitants are turning to positive and optimums to the project *Taipei Beautiful*. This research concludes 3 results:

I. Educate citizens' identification and recognition is necessary for sustainable urban developments.

II. Apply architectural education into the sustainable urban planning can be formulated as a series of urban regeneration projects action.

III. The proper educational strategies can promote the urban development of cultural and creative industries.

From the controversial debate among the citizens of Taipei to the acceptance during the projects, these educational strategies are providing a better educational solution to the urban development; to benefit the local habitants and gain the win-win situation will be the core concept in this educational strategy. The *2009 Taipei Deaflympics* and the upcoming *Taipei 2010 International Flora Expo* provide a good opportunity for the city government to rethink and re-implement their urban regeneration policies: *Taipei Beautiful*. With public intervention, the regeneration process for private properties becomes more efficient and reliable. The incentive scheme, tax waiver, and subsidization mechanisms also attract investment from the private sector, which can be helpful to reshape the cityscape in the short term and therefore improve urban competitiveness, including renovation of industries and revival of local economy, in the long term.

Although *Taipei Beautiful* is an ongoing project, achievements of the current stage have revealed potentials to significantly increase the number of tourists, decrease energy consumption, and promote economic benefits. For example, the first action plan has successfully created open spaces with total areas of 6.3 hectares, and greenery spaces of 20 hectares. This may reduce carbon dioxide emission by 30,500 tons annually when the project is done in 2012 and up to 1,600,000 KWH of electricity, half of Taipei's consumption, may be saved also. The projects have also stimulated 10 billion USD in investments and created more than 12,000 job opportunities.

TCG has opened up a new era of urban development for Taipei City. However, the follow-on development of *Taipei Beautiful* deserves to be examined and this study suggests that TCG can establish an effective evaluation system for different stages of each project. In addition, the analysis of how reshaping a cityscape may affect economy, environment, and society can be further researched.

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