EDU - PLANT

NEW INTERDISCIPLINARY EDUCATION SPACE FOR TEENAGERS IN SOUTH KOREA

by

Daeho Lee

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Yonsei University, South Korea, 2010

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Figure 1. Main Perspective View of Edu-Plant
EDU - PLANT:
NEW INTERDISCIPLINARY EDUCATION SPACE
FOR TEENAGERS IN SOUTH KOREA

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Daeho Lee

Submitted to the Department of Architecture
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Requirements for the degree of Master of Architecture

ABSTRACT

Edu-Plant is about the next education typology for teenagers from elementary school to high school in Seoul, South Korea, by criticizing the dominant existing two poles – public school and private institution. In 201, Korean Foundation of the Advancement of Science and Creativity (KOFAC) announced STEAM Education, the new vision for the next young generation of Korean students. It is focusing on the inspiring scenario for both teachers and students, allowing them to participate voluntarily in new field of creativity, sharing information and knowledge. The STEAM Education is the strong interdisciplinary system to increase students’ interest and raise learning efficiency and creativity.

Edu-Plant proposes the spacious creation based on this STEAM Education curriculum, aiming to the desirable studying environment which can adapt to flexible conditions of work based on social interaction. In this sense, the young students act as the knowledge worker or creator, enjoying the interaction of creativity, learning and personal development. It is to be the huge network and promotion of learning events, where people can learn and explore new technologies with creative art exercises.

Various spaces in Edu-Plant open to both students and the public, by broadcasting students’ creative work to their friends, families and anonymous public. It is true the vibrant field of new education, a seamless network of information gathering, social spaces, restaurant, and beautiful outdoor spaces.

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CHAPTERS

1. The Education in South Korea - Crisis of Public Education?

2. Analysis of Private Education in South Korea

3. STEAM - the New Vision for the Future public education Korean Government

4. Precedents - Towards the Open Education Field.

5. Gang-Nam, Seoul - the Site for the Edu-Plant

6. Edu-Plant - The Architectural Interpretation for the New Education
1. The Education in South Korea - Crisis of Public Education?

The education in South Korea has been praised for its comparatively high results throughout various international student competitions, especially related to the science and math. Because of its remarkable achievement and subsequent highly educated and skilled workforces, a number of people might easily conclude that the overall education system in South Korea has a positive competitiveness. However, looking at more detailed reports, especially related to the comparison analysis between the public and private education sector, we can clearly the imbalance of these sectors. Since last two decades, the social influence of education sector has been moved from public to private, by causing an explosive increase of private cram schools. The gap between these two sectors is getting bigger and bigger, creating the undesirable and negative circulation of entire education system in South Korea – the prerequisite learning from private cram school. The imbalance or power shift from public to private education sector, fundamentally weakens the entire system. The students no longer concentrate on the lecture and even no longer respect to their teachers in the public school. This has been one of the major social controversies in South Korea, arousing attention of both parent and government.
Satisfaction / Dissatisfaction of Public Education by School Level (%)

<table>
<thead>
<tr>
<th>School Level</th>
<th>No children</th>
<th>Primary School</th>
<th>Middle School</th>
<th>High School</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>70.4</td>
<td>78.4</td>
<td>83.1</td>
<td>83.5</td>
<td>88</td>
</tr>
<tr>
<td>Dissatisfaction</td>
<td>29.5</td>
<td>21.5</td>
<td>16.8</td>
<td>16.4</td>
<td>11.9</td>
</tr>
</tbody>
</table>

Gap in monthly expenditure for private tutoring by Income (Unit : 10 $)

<table>
<thead>
<tr>
<th>Monthly Income Level</th>
<th>Cases</th>
<th>Average</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 300</td>
<td>359</td>
<td>7.4</td>
<td>15.2</td>
</tr>
<tr>
<td>300 - 399</td>
<td>213</td>
<td>17.1</td>
<td>27.2</td>
</tr>
<tr>
<td>400- 499</td>
<td>113</td>
<td>20.8</td>
<td>26.3</td>
</tr>
<tr>
<td>500- 599</td>
<td>90</td>
<td>28.6</td>
<td>30.6</td>
</tr>
<tr>
<td>600- 699</td>
<td>46</td>
<td>41.0</td>
<td>49.2</td>
</tr>
<tr>
<td>700- 799</td>
<td>29</td>
<td>37.6</td>
<td>50.4</td>
</tr>
<tr>
<td>800- 899</td>
<td>12</td>
<td>51.1</td>
<td>38.9</td>
</tr>
<tr>
<td>900- 999</td>
<td>11</td>
<td>26.4</td>
<td>30.6</td>
</tr>
<tr>
<td>Above 1,000</td>
<td>34</td>
<td>45.0</td>
<td>54.2</td>
</tr>
<tr>
<td>Total</td>
<td>907</td>
<td>18.3</td>
<td>30.2</td>
</tr>
</tbody>
</table>
Distribution of Parents’ educational spending
(Figures given as percent of average total household educational spending)

Source: Korea National Statistical Office
Prerequisite Lesson in South Korea

Source: Korea Foundation for the Advancement of Science and Creativity

- N/A
- Experienced Prerequisite Lesson

<table>
<thead>
<tr>
<th></th>
<th>Elementary School</th>
<th>Middle School</th>
<th>High School</th>
</tr>
</thead>
<tbody>
<tr>
<td>same course</td>
<td>248 (35.84%)</td>
<td>292 (43.65%)</td>
<td>319 (37.09%)</td>
</tr>
<tr>
<td>1 semester</td>
<td>265 (38.29%)</td>
<td>259 (38.71%)</td>
<td>361 (41.98%)</td>
</tr>
<tr>
<td>1 yr</td>
<td>100 (14.45%)</td>
<td>68 (10.16%)</td>
<td>141 (16.40%)</td>
</tr>
<tr>
<td>2 yr</td>
<td>55 (7.95%)</td>
<td>35 (5.23%)</td>
<td>31 (3.60%)</td>
</tr>
<tr>
<td>3 yr</td>
<td>24 (3.47%)</td>
<td>14 (2.09%)</td>
<td>8 (0.93%)</td>
</tr>
</tbody>
</table>
2. Analysis of Private Education in South Korea

The 'Hagwon', the private institute or cram school, is the monstrous invention come out of the extremely competitive examination-hell in South Korea. It has become pervasive urban elements in Seoul (especially in Gangnam District), South Korea, by locating itself in every block. It is interesting to see the collectiveness in a certain urban chunk in Gangnam, the Mecca of private institutes, by focusing how the private schools create various relationships between themselves and other adjacent programs such as restaurants, snack bars and retails. This collectiveness enhances the vitality of the district in which the private schools locate.

The research will be started on the question of how these private schools are activated within the urban context and when the moments of culmination of various activities of students and their parents happen. Therefore, It is possible to say that, by analyzing the existing conditions of a certain building or a certain cluster of buildings, there might be some potentialities from the current situation, as well as something to be improved in terms of architectural qualities.
The excessive competition for exam has triggered the emergence of private cram school, accelerated by the logic of market economy since 90s.
It is clear to see the change of density of ‘Hagwon’ (private cram school) from the city center to the Gangnam District, following the timeline.

This density-shift is deeply related to the education policy change of government from 1980. The government decided to move the top-ranked public and private highschools in Seoul, South Korea from the city center to Gangnam District Area.
Gradient of the Number of ‘Hagwon’ (Private Cram School)

- Most Famous Cluster Area of Private Cram School in Gangnam

2003, Seoul Gangnam District Office of Education
CURRENT SITUATION

HAGWON (private school) Street

In contrast to the richness of programs of current situation, the interconnectivity between the programs is extremely conventional and even banal. The shops such as snack bars and convenient stores surrounding the private cram schools only have ground level access. Therefore the journey is too simple and boring to enjoy the sequence of conglomeration urban entity.
The explicit imbalance between Hagwon and other programs show how teenagers (students) spend their evening and nighttime without experiencing any outdoor + cultural activities.

The lack of cultural + outdoor public space leads young students to undesirable emotional experience through the poor urban environment in terms of social activities.
CURRENT SITUATION

TYPICAL WAY OF CONNECTION; GROUND ACCESS + ELEVATOR

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In 2011, to overcome the crisis caused by the imbalance between public and private education sectors, Korea Foundation for the Advancement of Science and Creativity (KOFAC) announced their future plan STEAM, new vision for the young students from elementary to high school. STEAM is an acronym for Science and Technology interpreted through Engineering & the Arts, all based in Mathematical elements. The main goal of this new education system is to establish a framework for inter-disciplinary network, encouraging the students and teachers to have interests for the classes and lectures.

“STEAM is EASY and FUN to implement.”

(http://www.steamedu.com/html/about_steam_education.html)
Polybius, James Houston

Understand Music, Finally Studio

Natural Light and Prism Art Installation

Transparent Animal Skeleton Origami, Takayuki Hori

Spherikal, Ion

Weather simulation Installation

Magnetic Art Installation

New Fabrication Technology
Diagram for the Interdisciplinary system of STEAM

Text in Light Grey - Elementary School
Text in Grey - Middle School
Text in Black - High School
There have been a number of attempts to suggest the radical architectural interpretation throughout history. The projects are provoking not only because of their architectural solutions, but because of their radical thoughts about learning space. The four precedents share the common ground in terms of the definition of learning space, which should be the place for flexible conditions to work based on social interaction.

The imaginations from these precedents are quite similar to the interaction of interdisciplinary system, creating space for a laboratory for learning.
a) FUN PALACE : CEDRIC PRICE (1961)

We just haven’t learned how to enjoy our new freedom: how to turn machinery, robots, computers, and buildings themselves into instruments of pleasure and enjoyment.

CEDRIC PRICE (Cedric Price. “A Me”!, !:e m Londoners: draft lOr a promotional brochure for the Fun Palace, Canadian Centre for Architecture, Montreal, Cedric Price Archive lhereinafter Price Archive).

The Fun Palace as Virtual Architecture Cedric Price and the Practices of Indeterminacy

STANLEY MATHEWS

It would be an immense kit of parts with which people could amuse themselves, so that for a few leisure hours each week, they might escape from mind-numbing routine and the monotony of serial existence and embark on an exciting journey of creativity, learning, and personal development. It was to be a “university of the streets,” where people could learn a language, watch a film, make a film, explore virtual worlds, learn to cook, teach other people to cook, learn to use a computer, rehearse a neighborhood chorus, or simply watch everyone else. Workers whose jobs had become obsolete could take lessons, hear lectures, and learn a new job skill.

http://www.metamute.org/editorial/articles/bowels-fun-palace
b) IIT MCCORMICK TRIBUNE CAMPUS CENTER, OMA (2003)

To create a new point of density for the campus, we located the building at the heart of IIT – a large rectangle between State and Wabash, 32nd and 33rd streets – and directly underneath the “L”, the artery that connects the campus to the rest of Chicago. By enclosing the tracks above the Campus Center in a muffling stainless steel cylinder, a formerly deafening no man’s land becomes a not only tolerable but a magnetic environment. The encircled track – known among students spontaneously as the Tube – becomes a crucial part of the Campus Center’s, and IIT’s, image.

Rather than stacking activities in a multi-storey building, we opted to arrange each programmatic element of the Campus Center in a dense single plane that would foster an urban condition. To achieve this, in 1997 OMA carried out a study to map the “desire lines” of student foot traffic across the campus. These intersecting diagonal paths are maintained inside the Campus Center itself, linking the multiplicity of activities via a network of interior streets, plazas, and urban islands that form neighborhoods: 24-hour, commercial, entertainment, academic, recreation, and other urban elements in microcosm.
c) Kanagawa Institute of Technology (KAIT), Junya Ishigami (2007)

The studio is about the closest you can get to the feeling of working outside while being indoors. The floor-to-ceiling glass makes the building appear weightless and elegant, and the open plan preserves the building’s sense of transparency as the viewer’s eye can shoot directly across the uninterrupted space. 305 columns of various sizes support the stripped roof of skylights, yet their white color keeps the focus on the space and the view, not the structure. The columns, although seemingly random, as specifically placed to create the sensation of zoned spaces, but their nonrestrictive quality provides a flexible layout to suit the changing needs of students.

(http://www.archdaily.com/66661/66661/)
D) Rolex Learning Center : SANAA (2010)

Built on the campus of EPFL Ecole Polytechnique Fédérale de Lausanne, The Rolex Learning Center designed by the internationally acclaimed Japanese architectural practice, SANAA, will function as a laboratory for learning, a library with 500,000 volumes and an international cultural hub for EPFL, open to both students and the public. Spread over one single fluid space of 20,000 sq metres, it provides a seamless network of services, libraries, information gathering, social spaces, spaces to study, restaurants, cafes and beautiful outdoor spaces. It is a highly innovative building, with gentle slopes and terraces, undulating around a series of internal ‘patios, with almost invisible supports for its complex curving roof, which required completely new methods of construction.

“The Rolex Learning Center,” Patrick Aebischer, President of EPFL, said, “exemplifies our university as a place where traditional boundaries between disciplines are broken down, where mathematicians and engineers meet with neuroscientists and microtechnicians to envision new technologies that improve lives. We invite the public into this space to convey the message that working in science is working for the advancement of society.”

(http://rolexlearningcenter.epfl.ch/)
Study for Precedents Typologies

1961 FUN PALACE, CEDRIC PRICE

2003, IIT Student Center, OMA

2007, KAIT, Ishigami Junya

2010, Rolex Learning Center, SANAA
5. Gang-Nam, Seoul - the Site for the Edu-Plant

GangNam, Mecca of Private Education

It has become pervasive urban element in Seoul (especially in Gangnam District), South Korea, by locating itself in every block. It is interesting to see the collectiveness in a certain urban chunk in Gangnam, the Mecca of private institutes, by focusing how the private schools create various relationships between themselves and other adjacent programs such as restaurants, snack bars and retails.
HAGWON: Profit Private Institution

Case study 2 Dae-Chi Hagwon Block
Seoul, South Korea

Active Adaptation - Successful Education Business

SCHOOL: Formal Education

Case study 1 Dae-Chung Middle School,
Seoul, South Korea

Stagnation + Isolation - Crisis
Existing Site Condition

Zone A
1. CAU High School
1-1. Maebong Mountain Entrance

Zone B
2. DaeDo Elementary School
3. Gymnasium

Zone C
4. Suk-Myung Woman's Middle School
5. Suk-Myung Woman's High School
6. School Yard
7. Tennis Court
8. Memorial Hall
9. Bus Stop
10. Subway
Site Pictures
1. Bird's Eye view from the North East
2. Entrance for Zone C
3. Subway Entrance
4. Bus Stop + Elevated Pedestrian Connection
5. Vehicle way to the Mae Bong Montain.
6. Tree Barrier Fence for CAU High School
The siteplan reveals the intention for the active participation of both students (teachers as well) and public. Major circulation path for public, which cross the entire site diagonally from the subway station to the mountainous public park of the city, is naturally merged into the exhibition platforms of school.
The scale and composition of new masses is strongly contrast to the existing building. The scattered small boxes define the new identity, allowing a number of inbetween spaces for the interdisciplinary activities. The main route is not only for the circulation, but also for the vibrant promotion of students' work and performance.
The artificial topo will be the roof structure for EDU-PLANT, accommodating space for indoor sports activities and parking lots. It is not only a simple roof structure, but also the part of outdoor slab, and landscape. The topography implies the major public circulation spine.
The actual material for this artificial topography will be the transparent or translucent material such as glass and wiremesh, by totally exposing activities underneath.
Program + Circulation Scenario Study

The overall layout of circulation and program is generated based on the public access spine + interdisciplinary exposure platform. The starting point of the scenario of EDU-PLANT is the spine - from subway station to the green public park.
The zone A is space for the space science + biology (evolution theory). The planetarium, sphere volume, will be the icon of this zone, as well as the suspended structure for skeleton exhibition combined with origami art. The two themes coexist on the existing upper ground, which is 18m above the original ground level.
The zone B is the central area, which shows the highlighted space in the EDU-PLANT. By visually exposing various program such as sports activities+social interactions on the ground level, and the public exhibition on the upper level, the central zone maximizes the degree of interaction for interdisciplinary scenario.
The zone C is mainly for the music performance combined with computation class, which allows to visualize the rhythm, note and the composition of the song. The main performance area, which is directly linked to the underground subway station platform, will be the strong public attraction.
Interconnectivity – the superimposition of various layers

The axon shows the overall 3 dimensional stacking system of the layers from ground level to roof top level of new structure. The continuous exposure of various activities of students – sports, individual study, co-work production – maximizes the concept of inter-connectivity. In terms of structure, the primary structure is embedded to the artificial landscape surfaces - hills and valleys. All of the layers finally are merged or at least strongly connected into this surface.
Layer Level 1
- Indoor Sports + Outdoor Courtyard

Layer Level 2
- Individual Studio + Study Cells

Layer A Level 3
- Co-Production + Exhibition Area

Layer B Level 3
- Green Roof + Slab (Artificial Landscape)

Layer C Level 3
- Classrooms
Longitudinal Section

- From the DoKOK Subway station to the Maebong Public Park, the major circulation (spine) defines the continuous outdoor exhibition platform with a number of openings, creating many chances to encounter between students and anonymous public. Edu-Plant proposes the spacious creation based on this STEAM Education curriculum, aiming to the desirable studying environment which can adapt to flexible conditions of work based on social interaction. In this sense, the young students act as the knowledge worker or creator, enjoying the interaction of creativity, learning and personal development.
Space Science Cluster

- Floating sphere (Planatarium) is surrounded by five class rooms. The space between sphere and glass box is used as reception area. Also all of the class rooms have large openings toward the reception area by broadcasting the class activities to the visitors and other students.

Gym 2

- Gym 2 is the extension of existing gymnasium used by elementary students. The new Gym will be shared by highschool and elementary school students, by creating unexpected encounter and learning experiences.
It is to be the huge network and promotion of learning events, where people can learn and explore new technologies with creative art exercises. Various spaces in Edu-Plant open to both students and the public, by broadcasting students’ creative work to their friends, families and anonymous public. It is true the vibrant field of new education, a seamless network of information gathering, social spaces, restaurant, and beautiful outdoor spaces.

Existing School

- Existing wall of the elementary school can be used as climbing wall, allowing the students to enjoy other sports activities. This sports activity is also visually exposed to the upper level, the individual study platform.

Gym 1 + Outdoor Courtyard

- The major sports facilities hub, the cluster of Gym + Indoor pool and outdoor courtyard combined with restaurant and cafeteria.
Existing School - Existing wall of the elementary school can be used as climbing wall, allowing the students to enjoy other sports activities. This sports activity is also visually exposed to the upper level, the individual study platform.

Gym 1 + Outdoor Courtyard - The major sports facilities hub, the cluster of Gym + Indoor Pool and outdoor courtyard combined with restaurant and cafeteria.

Outdoor Amphitheater - Connection to the Subway Station - The Sunken Garden + amphitheater is used for the outdoor performance mainly related to music + computation visualization.

Various spaces in Edu-Plant open to both students and the public, by broadcasting students' creative work to their friends, families and anonymous public. It is true the vibrant field of new education, a seamless network of information gathering, social spaces, restaurant, and beautiful outdoor spaces.
The Exterior View (Communal Outdoor Place)
The Exterior View (Public Exhibition Platform)
FINAL MODEL VIEWS
Bibliography


