DESIGN EDUCATION FOR CHILDREN IN A COMMUNITY OF PRACTICE - A CASE STUDY OF THE PARTICIPATORY DESIGN WORKSHOPS FOR SCHOOL RENOVATION

Kumi Tashiro[1], Shin Osaki[2], Katsuya Hirano[3] and Katsushi Nagumo[4]

[1] Faculty of Architecture, The University of Hong Kong, Pok Fu Lam, Hong Kong
[2] Department of Civil Engineering, The University of Tokyo, Tokyo, Japan
[3] International Research Institute of Disaster Science, Tohoku University, Sendai, Japan
[4] NAGUMO DESIGN, Tokyo, Japan
kumit@hku.hk, osaki@civil.t.u-tokyo.ac.jp, hirano@plan.civil.tohoku.ac.jp, nagumo@nagumo-design.com

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ABSTRACT:

This is a case study of design education for secondary school students through design workshops in the basic curriculum at a school in Japan. There was a renovation plan for a 30-years-old school building, and the education board of the town wished to make the new school much nicer and child-friendly for learning environments. The board asked design professionals to become involved and organized some workshops for students. Eight workshops were held during one and a half years. Workshops were designed for Eighth graders who had no design training, based on the basic skills of design; sketching, collage, measurement own body scale and use them. Gradually it was extended to further skills and knowledge including brainstorming, discussion, and presentation skills. At the end, students designed three kinds of multi-purposed units and the process of workshops was awarded the "Kids Design award 2012", and the "Good Design Award 2012".

1. INTRODUCTION

Do we design professionals think that children cannot design as professionally as us? Or do we still believe the myth that all children are naturally creative enough for design? Are their environments always arranged and provided by adults even if it's mainly used by children themselves? Children might not be able to design without any design training; however, we can say that all of the above are not true because we know that

if there are opportunities for children to learn some basic ideas of design, have design training, and experiences to work with design professionals, children can design by themselves. It is shown from a case study that professionals and children can work together in basic school curriculum and design education, as reported by design workshops at a secondary school in Japan.

2. THE TOWN AND SCHOOL BACKGROUND

This case was carried out at a junior high school in *Hiraizumi*, Iwate Prefecture, Japan. Iwate is located in the northern part of Honshu, the main Island, and *Hiraizumi* is located in the southern part of Iwate. *Hiraizumi* covers 63 km^2 of land, and has 8,400 inhabitants (January 2012). Main land use is for forests and barren land (48.2%), and then cropland (25.9%=rice fields 19.8% and vegetable fields 6.1%). Using the moderate mountain slopes along the rivers and alluvial plains, complex management of "rice field and commercial cropland" has been engaged in traditionally.

In 11th~12th centuries, *Hiraizumi* had a very powerful political and administrative position in the northern area of *Honsyu* Island, and struggled for supremacy with Kyoto until it lost in the civil war of 1189. Many temples and shrines, traditional culture, and ruins still remain now, and such architecture and gardens represent the Buddhist ideologies and culture-a group of archaeological sites were registered with UNESCO world cultural heritage in 2011.

There are two elementary schools, one junior high school, and no high school in the town. After graduating from junior high school, most students go to different high schools in other areas. In other words, this means that the junior high school is the only one common facility where everyone who lives in the town goes and shares the same experiences at the school for three years. And this 30-year-old superannuated school building was planned for renovation.

Under the renovation of the old school building in the town, the board of Education (BoE) decided to make the new school much nicer for learning and a more child-friendly environment as much as they could. Then BoE planned

to hold a workshop to collect students' opinions. However, they just knew it would be a good idea to have a workshop but did not know what to include. BoE asked a university professor to design a workshop for the new school. The professor organized a team of design professionals and conducted a workshop. After the workshop, the team realized that students had their own ideas for their new school, but just didn't know how to express them. It also seemed that there would be more possibilities to make a better school if students are engaged in the design their own school, because the school is where the students will spend three years. However, all design work of the school building had already been done and construction had already started at that time. BoE and the workshop team arranged that involvement of students in the design proposal of furniture for common space called "the communication hall" at the new school.

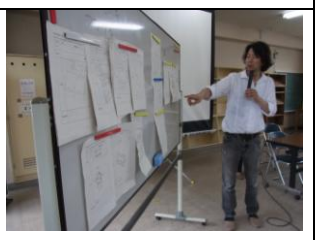
3. DESIGN WORKSHOPS

The most important purpose of the workshops was to build up students' attachment to the new school through engaging in part of the design and construction works of the school building. Therefore, the theme of the workshop was "design our place at school". A common space, a kind of assembly hall called "the Communication hall" was planned at the new school. The hall is the center of the school and is placed right next to the main entrance where all students, teachers, and visitors come through. And the space is connected to most other spaces such as classrooms, library and ICT center, broadcast studio, teachers' room, and courtyard. The school building has two floors, and the hall has an atrium. The workshops were basically planned with furniture layout as the main work at the beginning. One more hidden purpose of the workshops from an educational perspective was to reduce the students' stresses from the limitation and inconvenience of school life because of renovation during the construction period. We tried to create positive messages from negative images, for instance, "this special period would be a chance in a lifetime to encounter special experiences". Most of the works were connected to local history and tradition and the new school building as much as they could, to make all the work in the workshops to sound more meaningful and interesting.

In the initial plan, four workshops in six months were planned; however it gradually was allotted some extra time and financial support, so eventually eight workshops resulted in total; five design workshops and three hands-on workshops were carried out, and the entire period allocated was one and a half years (Table 1: Workshop schedule). Workshops were designed for Eighth graders who had had no special training in design before. The workshop team was formed by a mix of designers and researchers as facilitators. The workshops were based on very basic design skills such as sketching and esquisse, measurement of body scale and used it to roughly estimate some spaces. After that, it was extended into further scheme; design and collaboration skills and knowledge included brainstorming and presentation. Several sub-workshops for teachers were also carried out, so that teachers could understand the essence of the students' workshops which would be held in the classroom. Once teachers understood, they -as professionals teaching teenagers- become very quick learners to produce some collaborated contents with school subjects such as Math, arts, crafts and comprehensive curriculum in the daily schedule with prospects for the next series of workshops. Workshops were only held once in a few months, so the teachers' work helped to keep students thoughts and motivations squarely on the workshops.

Table 1: Design workshop schedule

WS#	Date	Summary	Activity photo
1st	Oct. 2010	Introduction To get a sense of the space of the hall using a 1:1 scale model and body scales. To extend the idea of the hall sharing many examples and images of the school hall.	

2nd	Jan. 2011	Brainstorming Small groups hold discussions about the functions of the hall that they need. For sharing images and smooth discussions, everyone creates a photo collage of their ideal hall and shows them to each other.	
Mini (for *Managers* and *Creators* only)	Feb. 2011	Confirmation of the criteria Consider all opinions from the previous workshop along the criteria determined by the students themselves who carefully pick the elements for the hall.	
3rd	Jun. 2011	Design Basics Listen to design intention and methods from designers and professionals while showing samples that they have designed; then start designing by themselves with extracted elements from previous workshops.	
4th	Jul. 2011	Design & Presentation Every group gives a presentation of their idea enhanced with	

		comments by professionals, then propose various patterns of "communication" using 2~3 units picked from the presentation.	
5th	Sep. 2011	Proposal Every group proposes the various usage of the hall with units designed by them, and all patterns are shared and will be proposed to the Education board.	

3. 1. WORKSHOP#1 - INTRODUCTION

The first workshop addressed that enhance student's motivation for the design workshop. Most of the seventy participants who were entirely second graders of the school had no experience of any workshop before. The start of the workshop was arranged as "Opening Ceremony" in the gymnasium, and every student received a "Certificate of appointment" from the Mayer which told them "your mission is to research and design a nicer school environment for the new school building and then report the result to me". After the opening ceremony, participants tried two missions. One was to measure their body parts, and the other was to use such body scale to measure the spaces, such as unit space for sitting and standing, cozy distance with others. For this activity, a 1:1 model space of new hall set in the gymnasium. After this work, students went back to their classroom and watched a lot of pictures of various school halls around the world, to stimulate images and ideas in their heads. Finally, students also watched Perspective drawing and blueprints of their new hall and heard the description of the new school building from the architect who designed the new school. After the workshop, students said: "Still not familiar with what this workshop is about, but somehow it was exciting", "It was a little difficult, but I want to try", "I was excited when I

received a certificate of appointment", "I can't wait for the next time." From these comments it seemed that the primary aim of opening had been achieved.

3. 2. WORKSHOP#2 - BRAINSTORMING

The aim of the second workshop was to stimulate a lot of images and try to show the images in their heads to others. First of all, everyone made a photo collage of hall furniture as homework, shared it with others, and then tried to explain it. The facilitator team realized in previous workshops that students showed better understanding of the images of space when they saw 3D models, so the team provided a 1:20 model of the hall for students' use from this time on. 1:20 is quite a big scale as an architectural model; however, it was useful for students to clarify the space image and moreover it was used as a layout checking model in further workshops. The main activity was brainstorming in divided groups. There were 12 groups formed and each group had 6-7 members. Even in brainstorming, they tried to visualize and share ideas with others, so they used sticky memos and all ideas were written down on the memo one by one. Then grouping and exporting of keywords was performed by the by the "KJ method". Visualizing ideas is an easier way to share them with others. Students shared their images and expectation for the hall through the work.

On the school calendar, the next workshop was scheduled for four months later. The team thought that it was too long a break and were afraid that students would lose interest and forget many things. To keep them connecting to the design workshops, every student was given a role such as "Creator", "Coordinator", "Presenter" ,"Researcher" and "Manager"; for group works(Table2). During the break period, assignments were provided to students according to these roles.

Table 2: Roles and works

Role	Mission	in a group
Creator	A person in charge for matters concerning the furniture	1-2

Coordinator	A person in charge for coordination between other group, contact with teachers and facilitators	1
Presenter	A person in charge for presentation	1
Researcher	A person in charge for collecting data and organizing materials	1
Manager	A person in charge for management of group work	1-2

According to this strategy, one mini workshop was held for "Creators" and "Managers" in the next month. This mini workshop aimed to check all ideas from previous brainstorming and set criteria determined by the students themselves, and then they chose the elements for the hall (Table 3). More "mini workshops" were planned, however all workshops stopped for a while because of the Great East Japan Earthquake in March 2011.

Table 3: Checkpoints

	Checkpoint
1	Do we really need it at the school?
2	Is that function required for our hall?
3	How is the balance of between number and scale?
4	Does it think about eco-friendly/energy savings?
5	Is there any realistic and possibilities of achieve?
6	How about budget?
7	How does it think about from the viewpoints of other graders, teachers, alumni, parents and visitors?
8	Are you sure that it is still good to use decades later?
9	Does it have characteristics of my town?

3. 3. WORKSHOP#3 – DESIGN BASICS

Three months after the quake, the workshops were restarted by the efforts of many people who were involved in the workshops. The third workshop was the shifting stage from soft images to concrete design. Students had become accustomed to expressing their ideas, so in this workshop they had to get over the hurdle a little higher. A carpenter who lived in the town and thought

about good design and tried to make a nicer landscape was invited to the workshop as a guest speaker and shared his works with the students. Students got a very strong impression from his works, and then gradually noticed good design in their daily life. After the workshop, students said, "I thought I also was doing something for my town", "I did not know that he designed and made the things I saw every day!", "I want to be a carpenter."

After the lecture, students worked in groups and every group drew some furniture for the hall. Each group could represent through rough drawings their unique thoughts and originality. Through the several workshops that students had attended, knowledge and skills accumulated. At the same time finding it difficult to create new designs, students admired the professional design works. To prepare the next workshop, students announced that they had to do a new assignment (Table 4), and would present the results in next workshop.

Table 4: Assignment conditions

	Condition
1	Each group should submit only one type. (Units with size difference are acceptable.)
2	No limit about size, however it should be portable.
3	Formation of usage at least two different type are also proposed by each group.
4	Only one proposal is accepted from each group
5	Be named with "Dai" (it means "a stand" in Japanese)
6	Avoid similarity with other groups. Must check before submit.

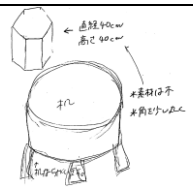
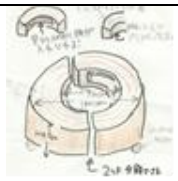
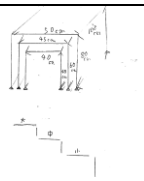
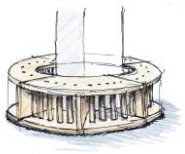
3. 4. WORKSHOP#4 – DESIGN AND PRESENTATION

The presentation in front of all participants was one of the exciting experiences in the fourth workshop. There were two rules of presentation; first was that all members in the group had to take some role in the presentation, and the second one was when watching others', individual students had to write short comments for each group. It was useful to keep their attention for all presentations in a limited time, and also encouraged

students to exchange their ideas and comments. Twelve different kinds of unique "units" were proposed by students.

After this workshop, students received their next assignment which was for each group to pick three designs from the 12, and consider a layout using them within a month. After the summer break, design professionals brushed up the students' proposals and returned them to the students with comments, and asked students' opinions again. As a result, three types of units were finally proposed (Table 5).

Table 5: Students' design and brush up

	Hex units	Circle units	Rectangle units
image			
design			
product			

3. 5. WORKSHOP#5 - PROPOSAL

Twelve situations and layout plans using three units from spring to winter, from morning to after school, and from daily use to special occasion were proposed in the fifth workshop. This workshop was scheduled as the last one of the series of design workshops at the beginning and the design goal was the proposed layout plan. At this time, still nothing had been decided after this last workshop. Students wanted to produce their units; however, no one knew if they could really make it or not, therefore students worried about that. All of the students' proposals were very attractive, and all members who were involved in the workshop also wanted to make the units.

Fortunately, shortly after this, they succeeded in obtaining a grant from the *Groundscape Design Institute* to make the students' units.

3. 6. WORKSHOPS – MOCK UP

Since the three unit designs had been confirmed, the next step was to decide manufacture specifications and produce them. However, to enhance the opportunity of the students' participation in the manufacturing process, and in order to verify the usability in reality, we had another three more workshops for mock-up and finishing (Table 6). Each mock-up model of three units was made from locally grown timber with local carpenters' traditional techniques, and mock-up versions of them were made by students in two workshops. When finished, the students checked the units' usability and comfortableness, and considered height, size, portability and materials, and then refined them.

In the final workshop, all students participated in branding the units with a hot iron, mounted a wooden badge painted by the students on the backside of the units, and finishing was achieved with oil made from rice bran one unit at a time. Students not only thought about the design but elements of environmental-friendliness, natural materials, sustainability, and local industries through this final workshop.

Table 6: Hands-on workshop schedule

WS #	Date	Summary	Activity photo
1st	Nov. 2011	Mock up1 Mock up and examination of prototype of hex units. Consider height, size, usability, comfortableness, and materials.	

2nd	Dec. 2011	Mock up 2&3, and Rule-making Mock up and examination of prototype of round units and rectangle units. Put three units in the hall and simulate usage. Then consider the rules to use.	
3rd	Mar. 2012	Finishing Branding with hot iron, mount the wooden badge painted by the students to back of units, and finishing with wax made from rice bran.	

4. FINDINGS

In this process, three units were designed and produced so it can be said that workshop itself was successful. In addition, verification of what tool and method was effective for children and the community through this process was attempted.

In order to recognize space, basically, using 3D models is more effective than 2D models; however, reduced scale is still considerable. Those things that are too large or too small have only a small effect. The most suitable scale in this case was 1:20 which can overview the whole space and also is capable of operation by hand. The photo collage was also effective because it is relatively easy for everyone to express the images without drawing (Figure 1).

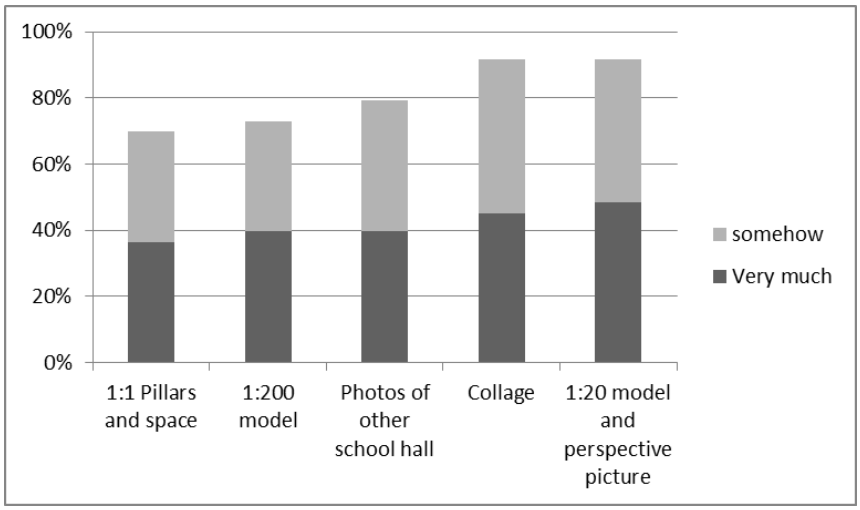


Figure 1: Spatial image cognitive effectiveness

Through the workshop, pride of life in the town was increased. This is because students worked on the knowledge and cultural background of local traditional design, and had to think about better landscapes and sustainability. In addition, they met professionals and knew that their works in the town encouraged the young people very much, and it also increased their affection to the town (Figure 2).

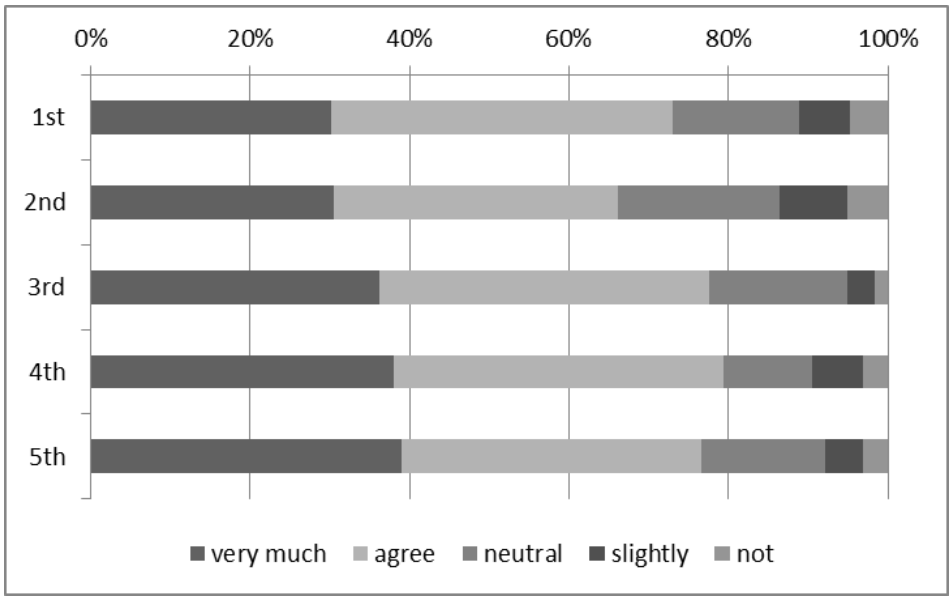


Figure 2: Evaluation of affection to the town; "I like my town".

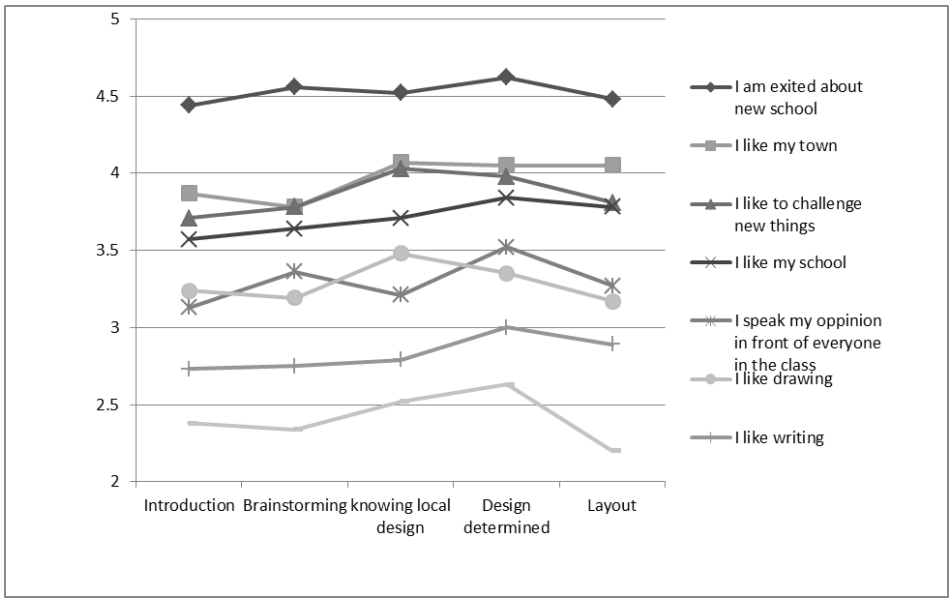


Figure 3: Evaluation of student's consciousness in daily life

With regard to students' attitude to daily life, positive and active answers slightly increased between the workshop periods, in particular, up to the fourth workshop which was the time when students proposed their ideas and designs to others (Figure 3). It declined in the fifth workshop, but it might be said that they were unsure about the workshop result and the product, and students lost motivation.

5. CONCLUDING REMARKS

Creating a good design by middle school students is possible by overlapping the basic steps little by little. However, good programs and good facilitation are definitely needed. It will be good if a designer could have both of good programing skills and good facilitation skills by her/his own, however, it will also be good or even easier to carry out with team that consist of design professionals and educators, because both of them can focus on their profession. It might be better to have guidance by a team of professionals with design educators. The important role of design educators is to connect different sides. It is thought that this is one of new scopes of work of those who have studied design (Figure 4).

The design workshop must also get involved in supporting local communities. So that it may also get professional help from the local area. In this case, not only students but also everyone who is involved thinks "This is MY

school". This feeling is the core essence of this project. At the end, it was proposed that furniture will be maintained by students once a year, and also suggested that alumni and community members will be involved in this yearly event.

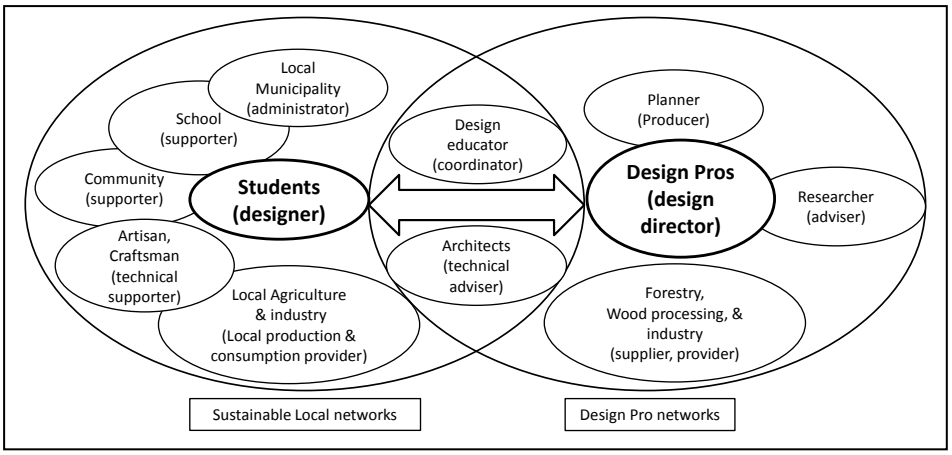


Figure 4: relationships between with local and professional

This case was not aimed at early education for the design elite, but tried to develop the creativity of children through design education, and community revitalization.

Incidentally, three kinds of multi-purposed units that were designed by students have been awarded the “Kids Design award 2012”, and the “Good Design Award 2012”.

Figure 5: awards winning products and its designers http://www.g-mark.org/award/describe/39346

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