Enhancing Private Open Spaces in Indonesian Cities: Preparing Children as Future Change Agents

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Abstract

House expansion in many Indonesian housing has triggered lack of private open space and thus lack of rainwater absorption space. This causes inundation and flood during rainy season. Earlier research showed that housing expansion was driven by increasing of family member which supported by increasing of family income. House owners' awareness of private OS was sufficient, but their knowledge was limited. Awareness alone is not enough to fix the problem. In addition, directly repair OS deficiency that has happened today is not practical. Thus, assigning the younger generation to become an agent in fixing this problem is an ideal concept. A program using fun-learning methods, such as creating mockups is planned. Approximately 770 students participated in this program and this study concluded that children absorb the knowledge well and expected to be excellent future change agents in improving the quality of their places and cities. This is demonstrated by the very alive discussion and the mockups that fulfilled what has been taught. Seventy percent was designed in well condition (ie. OS availability, vegetation, and windows for air circulation and natural lighting) and 20% was designed in excellence with creative and unique OS and building's facade.

Keywords: private open space, children, fun learning, mockups, change agents

Introduction

During period of occupancy, houses in Indonesia tend to be expanded to accommodate growth of family members, which is usually supported by improvement of family income. In general, house expansion can be constructed horizontally or vertically. However, the unpreparedness of the substructure of the house to bear the additional superstructure has led to a trend of horizontal extension. As a result, within fixed land size, this will automatically reduce the presence of private open space (OS) around it. This condition was suspected caused by limited knowledge and awareness of the house owners. They were suspected to have low knowledge on how maintaining private OS and low awareness on the importance of private OS for rainwater absorption and for providing access for both natural ventilation and day-lighting.

Enhancing city OS by encouraging people to provide private OS is a quite unusual approach since academicians are not entitled to decide what people do in their private space. However, since Indonesian building regulation has existed throughout years for regulating particular percentage of OS to be maintained within building site, studying OS of private property is not entirely

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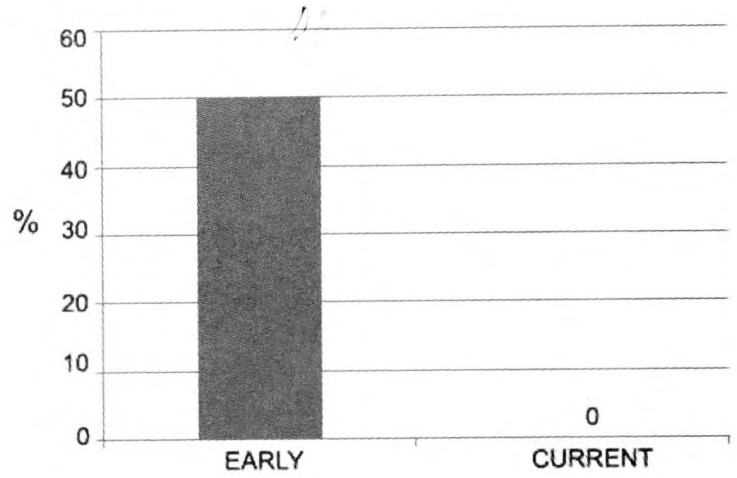
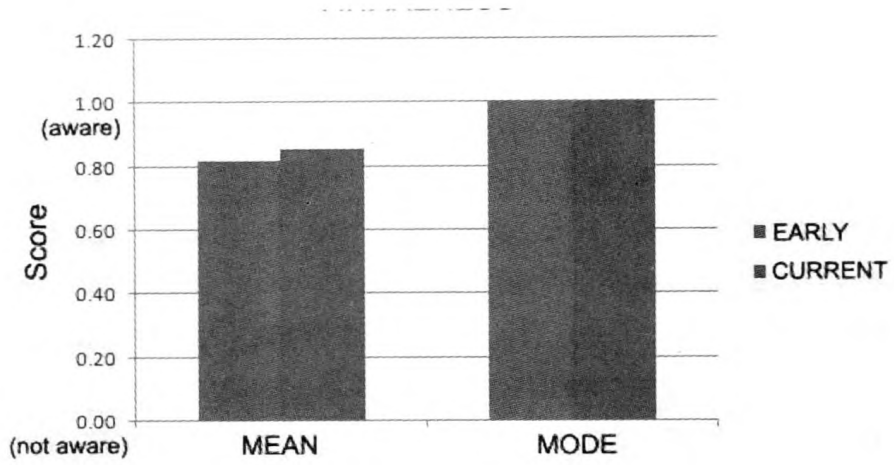
incorrect. In Indonesia, OS to be maintained in a public site is vary depends on regions and building functions. Generally, the OS to be maintained is 20% to 50%. Unfortunately, there is no specific regulation to maintain OS in private space. Building regulation specific to Sidoarjo area, which was the selected research area, suggests house owners to maintain private OS of house-lots for 10% only. At first, this was considered too small to give benefits for the house. Secondly, it never been evaluated by the regulator whether this rule is implemented. In so doing, we may easily find houses with almost zero OS (Mediastika, 2014, Fig.1a).

As it is unusual approach, earlier studies on green OS or simply OS within private property are also very limited. It mostly discussed on the necessity of public green OS and slightly disregards the benefits of private green OS. Study by Lacy (1990) has reported that clustered houses with protected OS were appreciated higher by market than those of single conventional housing with larger private yards. This condition refers to public open space limited to those who dwell within the clustered housing only. This might also be the case in Indonesia, where clustered housing is now becoming a trend, but maybe not the case of other region. This is in line with Connell and Walls (2005) who revealed that OS values are case study–specific. Particular OS area is unique to a particular region and time period. Thus, the way on how OS will be provided should consider the characteristic of a particular region. However, as a general term when space growth is not well planned, the presence of OS is considered as a luxurious space for people in any regions. This is also the case in Indonesia, where those living in a clustered house may enjoy the OS within the cluster, but those living in ordinary housing have no access for appropriate public OS. When public OS is insufficient, OS for rain water harvesting is also limited. Since it is not easy to provide public OS, neither in a closed area or in the city level, provision of private OS is considered as substitution of the unavailability of public OS.

Nevertheless, as a general term, beneficial effects of nearby green space have persisted throughout years, especially to improve people's health and wellbeing (Groenewegen, 2006). This finding is supported by a study comparing residents with a view of urban greenery and residents without such view which showed that those with view experienced better of well-being (Kaplan, 2011). With all these benefits, it is expected that house-owners are aware and possess knowledge on how OS shall be provided and maintained within house-lot, so as not to expect public OS provided by the city. A green OS on a private lot is never been bigger than that of public OS. But, the multiple effects of this insignificant dimension will play a role on the availability of sufficient OS throughout urban region.

Triggered by this issue, a research for specifically studying house owners' judgment on the important of private OS was conducted (Mediastika, 2014). Forty eight percent of houses which suspected of having insufficient OS were studied. The rest of 52% were not surveyed due to time and resources limitation. With this 48%, it all proven to having insufficient OS, with OS is toward 0%. The research concluded that average respondents possess sufficient awareness on the necessity of private OS (Fig 1b.). It also showed that there was grading in respondents' knowledge. In the beginning of occupancy, respondents possess very low knowledge, and then it develops slightly during occupancy period (Fig. 2). However, sufficient awareness and low knowledge is still inefficient to fix the improper house design immediately. More important, directly fixing improper design is problematic due to high cost and time implication.





a. b.

Fig.1a. Ratio of OS to house-lot of early and current condition in actual percentage.
Fig. 1b. Respondents' awareness of early and current condition

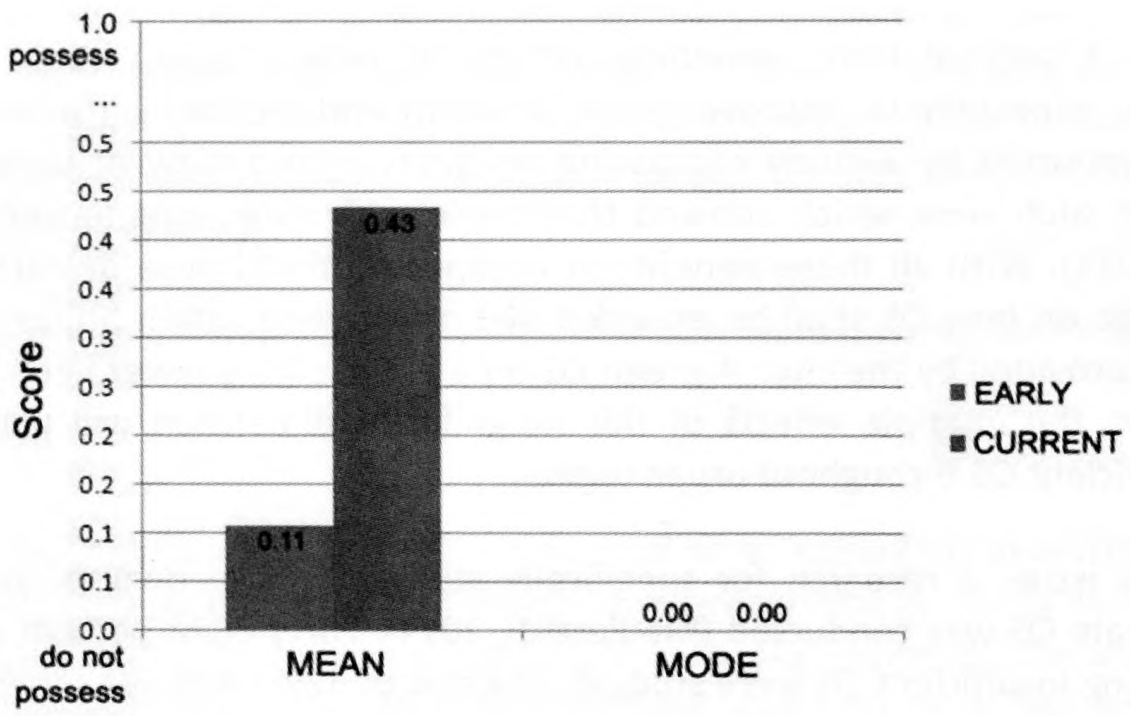


Fig. 2. Respondents' knowledge of early and current condition

Learning to condition that directly fixing the improper design is not practical; a further action to follow up the finding of previous study was planned. Based on the sufficient awareness but limited knowledge, further program to be conducted was sharing information among younger generations. Current condition of improperly house design was not planned to be fixed, but it was younger generations that was planned to cease the mistake and fixing the condition in the future. More than sharing information, the program was also aimed to build children's awareness on the necessity of private OS and healthy house and make them absorb the information given.

Action of empowering children as change agents has long been known, especially by the Non Governmental Officers (NGOs) to convey their messages and programs. Many were carried out unofficially, and the rest were officially. Most programs were conducted in rural communities and children were mostly attributes as change agents of social issues and hygiene and health (http://www.unicef.org/india/wes_2438.htm). At the UN level, children were also selected as change agents in the event of UN General Assembly Special Session on Children and the UN Study on Violence against Children. It reveals that children are the best change agents at both home and in the community. The UN believes that if we target the children, they will in turn bring change in the family and thereby the entire community (http://www.unicef.org/india/wes_2438.htm). In other cases, children are selected for change agents as behavioral changes were more evident among the children than among the adults. The impact of the project was reflected in concrete changes in the school environment as well as the home environments (Onyango-Ouma, 2005). More specific to sustainability issue, a study by Stuhmcke (2012) found out that the children participated in her project were able to think critically about environmental and sustainability issues. They were able to create change in their local contexts, and took on the role of educators to influence others' environmental behaviors.

Objective

The study was aimed to learn on whether knowledge sharing to children as future agent; in a particular educational method; is effective to convey the importance of private OS. This was limited to children's response immediately during the program i.e. how they absorb the information given, since the actual response is to be checked in a long future period.

Methods

Current surveyed houses were already expanded horizontally, and cost implication to fix the improper house extension is too high. Therefore, sharing knowledge on how maintaining private OS among current house owners would only fix the issue theoretically not practically. Within this situation, encouraging children to become future change agents is more beneficial, as they will develop their own houses in the future, so as not to repeat similar error.

A fact that previous study on private OS deficiency was conducted only in limited area of Indonesia should not limit area in where educating children regarding this issue would be conducted. Since there is trend of population growing; similar condition also exists in many Indonesian cities. Thus educating younger generation in any cities in Indonesia due to necessity of maintaining private OS was considered as an ideal concept. This study is planned as empirical study of both quantitative and qualitative data collecting method. The quantitative method is to record numerical data of the study and qualitative is to report the learning situation which could not be measured numerically.

Since the planned knowledge sharing is not merely to transfer knowledge but to make children deeply absorb information on the importance of private OS, the teaching method should be conducted in entertaining and empirical ways. Means that children should practice on how healthy houses with sufficient of private OS are designed. In order to disseminate this knowledge well, formal education venues were preferred, i.e. of formal schools and formal school time period. Using this formal concept, the program was managed to be conducted from one school to another from to time to time, without worrying to unavailability of school facilities. Conducting this program outside schools requires room and preparation of other facilities. Children of elementary and junior high schools were the targets. Those of lower than

fifth grade of elementary schools were not involved since their basic knowledge to absorb the subject given is not sufficient. Those of older than junior high school age were also not involved as they were considered entering the adult age and thus already having concept of how the healthy house should be built. Besides, the older are focus on preparing final exam.

There is no specific selection upon the school in where the program would be conducted, since in a long term goal, all students of elementary and junior high schools are the target. However, at this first stage, in order to save time, schools within reasonable distance of the author's office were selected. Later the program will be implemented throughout schools gradually.

Since it is sharing knowledge for children, the educational system was designed as an entertaining education. Not to be confused with term of 'entertaining education' introduced by Singhal and Rogers, the entertaining here means fun or happy learning. Singhal and Rogers (1999, in Singhal & Rogers, 2004) defined entertaining education as the process of purposely designing and implementing a media message to both entertain and educate in order to increase audience members' knowledge about an educational issue, create favorable attitude, shift social norms, and change the overt behavior of individuals and communities. Entertaining education is not a communication theory but a "communication strategy" intended to create a positive change among intended audiences (Singhal & Rogers, 2004). The program planned for children was mostly adopted the second term rather than the first one, as there was no media would be involved. It needs a particular communication strategy to create positive change of children perception and attitude toward the importance of private OS. Therefore, entertaining method was selected. Entertaining here means the teaching method should be conducted within atmosphere of relax and fun. In a similar term, it may be named fun learning, i.e. the way how learning is made enjoyable (Packer and Ballantyne 2004).

Concerning on the early stage of learning for children that should be conveyed in interesting method, the use of 3-D modeling is considered. In her book of Techniques for Teaching Young Children, MacNaughton (2009) introduces the use of modeling in gaining effectiveness of conveying knowledge. The model discussed in this paper is a real three dimensional of mockups. The use of building mockups is well-known in the school of architecture and interior design. It is the easiest way to assist both students and lecturer to have complete understanding on how design is proposed. Professionals also use mockups to convey their design close to reality for their clients to easily absorb the design concept. For children mockups made from colorful material are interesting objects. Making mockups as long as using easy material to design any shapes is considered attracting for children.

Earlier research which proved that children are excellent agent of change has encouraged this study to also empowering children. Within all those research, the effects of change delivered by children was not immediate. So as in this research, a real effect of community behavioral change toward provision of private OS is not reported. This paper will only report whether the children fully absorb the taught knowledge, which was shown by their mockups. Learning without mockups as long as it is conveyed in an interesting method such as, storytelling, watching movies, singing together, etc may also be fruitful. However, the authors believe that in this case, using mockups is a better way for transferring knowledge. The positive side of mockups is: a real 3-D model, the making is fun since children are freed to create their ideas, finished mockups may be kept as souvenirs either by student, group, class or schools. During the process of making mockups children learn on how to convey their idea, accommodate other ideas, and present all the combination in one mockup. This may mean that they also learn on how to conduct discussion and how to be fair to colleague's opinions.

The program was delivered by architecture lecturers who were plotted as guest teachers for the visited schools. This was considered as the first fun factor, when students meet new comer teachers. Second, brief knowledge on building, architecture, and healthy house with sufficient private OS was conveyed to the students. Pictures were also shown for students to easily absorb the subject (Fig. 3). Lecturing was given as short as 15 minutes so as not to make them bored. Then couple of minutes was allocated for them to absorb the subject and continued by dividing children into small groups consist of 3 to 4 students. They were freed to select group members so as to create cohesive group during constructing mockups (Fig.4).

Fig.3. A brief knowledge on the importance of private OS and healthy house was taught at the beginning of the program.
Source: authors

Thirdly, each group was assigned to construct a mockup of healthy house. The mockup should be built refers to standard of healthy house as explained previously, i.e. possesses sufficient private OS, and employs natural ventilation and day lighting. For easiness of mockups construction and creating cheerful learning process, play-dough was selected as the main material. Play-dough is colorful, soft and flexible to be shaped within minutes. This is suitable for a learning program that only be conducted for a couple of hours. Play-dough also easy and safe to be shaped as it does not require glues or cutters. Used play-dough is also easily to be reused either by students themselves for further playing at school or with siblings at home. In addition to play-dough as main material, other objects were also provided, such as thick papers for mock up's base, tooth sticks, straws, ice-cream sticks, and colored origami papers. The children prepare scissors, paper glue, and ruler. Approximately 60 minutes were allocated to finish the mockups task. At the end, the best mockup was selected in each class. Before a gift was awarded to the best group, a short evaluation was conducted. Children were informed why one was the best mockups. Followed by evaluation for all mockups regarding the positive and negative aspect each, so as children might fully absorb the content of the program and keep it in their mind during their upbringing until they are ready to have their own house to implement it.

Fig.4. Mock-ups constructing among students
Source: authors

Result and Discussion

The fun learning program has been conducted in 9 schools in Surabaya and Sidoarjo, Indonesia. Three elementary schools and 6 junior high schools were involved. Overall, there were 767 students joined this program so far (Table 1). The program was conducted simultaneously from one school to another in a schedule that matched to each school formal program. Most schools suggest the program is conducted after mid exams, final exams, or during their extracurricular session. Number of students in each class was vary. It could be as little as 5 students, such as in Mutiara Bunda 2 and Pelangi Kristus which conduct exclusive classes or as many as 38 students such as in Petra 4 for regular classes.

Table 1. Number of students involved in the fun-learning program

Schools	Number of Students	Number of Groups	Number of mock-ups		
			Well designed*	Very well designed**	Not proper ***
Mutiara Bunda 2 Elementary School	15	5	4	1	0
Mutiara Bunda 2 Junior High School	12	3	2	1	0
Angelus Custos 2 Junior High School	90	7	5	2	0
Pelangi Kristus Elementary School	7	2	1	1	0
Pelangi Kristus Junior High School	19	5	3	2	0
Kristen Petra 4 Junior High School	304	76	54	15	7
Kristen Petra 5 Junior High School	210	52	38	8	6
Mutiara Bunda 1 Elementary School	50	13	8	3	2
Mutiara Bunda 1 Junior High School	60	15	9	4	2
Sum	**767**	**178**	**124 (70%)**	**37 (20%)**	**17 (10%)**

* Possess OS, natural ventilation, day lighting
** Those of well designed with unique and aesthetic house and OS
*** Collapsed roofs or without vegetation

Number of students in the class did not significantly affect the learning process for constructing mockups, since both in regular and exclusive class they were grouped into 3 to 4 students. The friend they select to form a group has more impact on the mockups construction rather than overall number of students in a class. In so doing, there were classes with 2 groups only, and there were most classes with 8 to 10 groups. Of 767 participants, there were 178 groups formed in this program and 178 mockups have been constructed accordingly. Learning from what have

been conducted from class to class and from one school to another, this study found that in majority, students were eager to contributing in constructing mockups. This means that using play-dough was entertaining for them and that constructing mockups is also interesting. Ten percent of the groups (approx. 18 groups) were starting the construction with sketching their idea on a piece of paper, then discussing the role of each group member on what part of the house to be constructed. The whole discussion in the class was so alive, sometimes they were shouting one to each other. Even there was a time when the discussion was ended up with a member cried, means his or her idea was not accommodated by the group.

The figures appear in Table 1, might not fully supply figures for deep discussion. From here the authors realize that this study is not a quantitative study solely, but more a combination between quantitative and qualitative research. Not all of the findings could be represented in numeric. There was a lot more description to be presented in order to describe the findings. Although the total mockups constructed could be calculated, authors might only drew conclusion regarding the visible issue, such as mockups quality, but not of the process of constructing mockups, which rich of story. Mockups could not be grouped into ones by junior high school and ones by elementary school. It also could not be categorized that junior high school's mockups were better than those of elementary school ones. All seemed similar. In many classes, the junior high school students seemed very happy of playing with play dough as they have not play with it for a long time after they were graduated from kindergarten. However their overjoyed brought a slightly not serious atmosphere in the class, as they made fun of the dough and forget to construct mockups. Since mockups were similar in quality, judgment on the mockups was not grouped for 2 levels of schools as is presented by Table 1. Judgment on mockups was conducted with the following parameters:

1. Possess sufficient OS (at least 50% of the given site; in this case is the green paper, as seen on Fig. 5; remains as open space).
2. Design of the open space consists of vegetation (ground covers, bushes, shrubs, or trees).
3. Design of the house consists of opening apertures for day lighting and natural ventilation.
4. Design of overall house and open space is unique and aesthetic.

At the first stage, judgment was conducted for first parameter only. This study ensured that from 178 constructed mock-ups, all were built with sufficient private OS (100%). Since the play dough was prepared more than sufficient for each group, which allow them to create full house on site, they did not do this. This means that students have absorbed the instruction. Those who complied with parameters 1, 2 and, 3 were scored as "well designed". Last those who complied with all parameters were scored as "very well designed". There were also 10% of mockups which not properly designed, such as complied with parameters number 1 but with broken roofs or without vegetation.

Learning from the very alive discussion and the constructed mockups which in majority were "well designed", this study witnessed that school children of this program have absorbed the knowledge well. By working in a group, they were taught that in reality in the future, a family shall accommodate each suggestion and preference of family member on how a healthy house shall be developed.

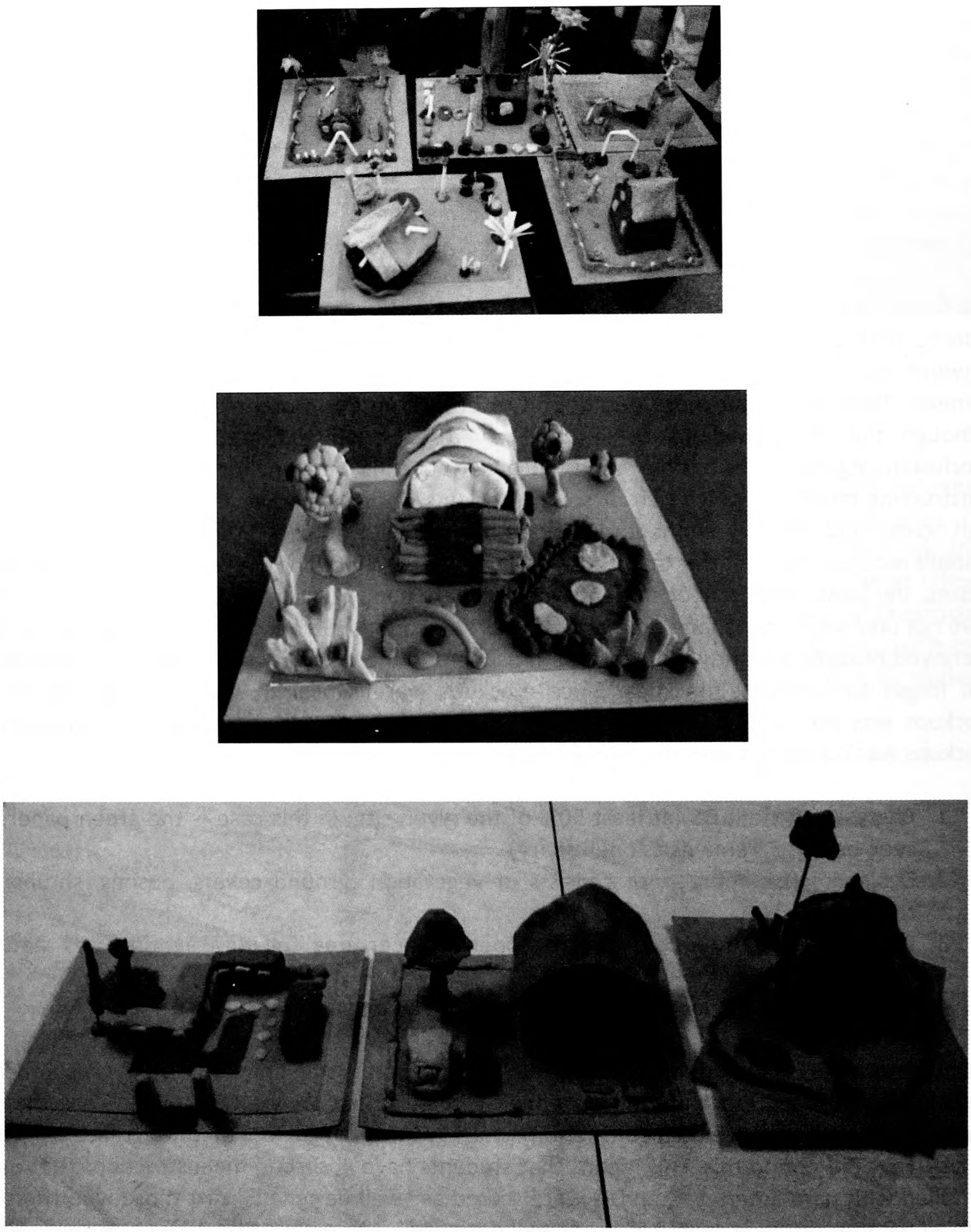


Fig.5. Examples of constructed mock-ups
Source: authors

Conclusion and Recommendation

This is a continuing long learning process and long program. What has been conducted is just the first period. This will be continued with the next and next periods. The direct impact of this learning process is not yet visible. At this stage we may only come to conclusion that the students absorb the knowledge well, which shown by their mockups and the process of constructing mockups. A significant conclusion drawn from this program is that 100% of participants construct the mockups with sufficient private OS as was taught. Only 10% of

mockups were designed not properly, but this was not dealing with OS issue, this was mostly regarding with construction issue of using play dough as roofing material which might not well constructed and the oblivion of providing vegetation. In overall 90% mockups were complied with the scoring parameters, which at least proved that they absorb the taught knowledge fully.

What will be seen in the long future is not part of this research. But authors believe that this program at least elevate children position from understand a little into deeply understand the issue. Using fun learning method we may expect that not only they absorb the knowledge well but it will become their long term memory (Ranpura, 2000). Not only that fun learning are more memorable than ordinary learning (Ranpura, 2000), but the program that encourages children to enter the cognitive level (by receiving a taught knowledge at the beginning of the program), affective level (by delivering opinion and conducting discussion during preparation of making mockups) up to psychomotor level (by constructing mockups) has develop children to easier build their long term memories.

Further we conclude that with fun learning and practical method, we may prepare children to be future change agent in enhancing private OS within house-lots in Indonesian cities. At the end, it is concluded that fun learning method specific to this study was efficient to be conducted, using the following aspects: new comer teachers, short and full of pictures teaching, making mockups uses play full material such as play-dough, and competition for the best mockups. We also learn that discussion in a group of 3 to 4 students may not effective and that one or two member's idea may not be accommodated which caused a quarrel within group.

In this study, data was gained only by observing the children and the mockups, which may cause bias in the conclusion stage. In so doing, a more specific data collecting regarding immediate response of children is recommended to support the observation. A survey to interviewing children' opinion after the program is suggested rather than filling a questionnaire, because filling questionnaire is not easy for school age children that may also cause bias conclusion. The use of play-dough may be combined with another hard material for roofing such as thick paper, in order to eliminate roofing construction problem during making mockups.

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