ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

Creating an Interactive Learning Environment Case Study of FEDA Kids and Teens Workshop 2013

Laila M. Khodeir

Manuscript Info

Manuscript History:

Received: 22 March 2014
Final Accepted: 23 April 2014
Published Online: May 2014

Key words:
Interactive Learning Environment (ILE), Architecture, Teaching methods

Corresponding Author

Laila M. Khodeir
Assistant Professor /Department of Architecture /Faculty of Engineering/ Ain Shams University/Egypt
archlailakhodeir@yahoo.com

Abstract

It is crucial to create an Interactive Learning Environment (ILE) while teaching architecture. This method was adopted in a workshop that took place in the architecture department at Faculty of Engineering (FEDA). The workshop aimed at creating an ILE through which the organizers and the participants of the workshop can learn. The workshop was part of the architecture department week that aimed at interacting with both architectural students and community members. The main theme of the workshop was: "Make your own Dream house", while its challenge was that it was intended for two different age groups: kids from 7-10 years old and teens from 11-17 years old. This paper aims at presenting the experiences and lessons learned during the preparation and execution of the workshop, to offer a real-life case study that went beyond applying traditional methods of teaching and to reveal the keys of achieving an interactive learning environment. This objective is achieved through the analysis of the case-study workshop, where the phases of creating the workshop are discussed in detail. Strategies for dealing with each age group, including motivation, breaking the ice, narration and praising strategies, helped the workshop instructors to develop an ILE. The paper ends up with detecting and measuring the two main variables that influenced the creation of intended ILE throughout the workshop. The results of this paper are vital to those who teach architecture to target groups of different background levels and ages, to promote interaction and to allow maximum understanding of the concepts of architecture.

1. INTRODUCTION

Learning is not an activity that occurs only in the mind, but is also an activity that happens in a social and cultural context. When learning is situated in real-world contexts, what is learned is better remembered, and problem-solving skills become linked to situations similar to those likely to be used, thus facilitating transfer. [1] In general, the effective learning environments focus on students' understanding and application of knowledge. [2] This can be done by asking students to participate in projects, solve complex problems, design and execute experiments, think about their ideas, listen to the ideas of others and, in general, assume control of their learning. Thus engaging students of architecture with the teaching staff in active learning processes is crucial. [1]

Architectural education has a very unique nature amongst many other educational sciences. The architectural student is confronted with various factors that impose different design solutions; the analysis of these factors enables

them to make different related design decisions. On the other hand, the study of architecture comprises the implementation of theories and rules extracted from narrative lectures and tutorials in different subjects, such as structural engineering, environmental control, theories of architecture and urban design.

The role of the instructor focuses on couching the student during their analysis, proposing design alternatives and finalizing their project. [3] It is therefore important to provide students with culturally meaningful and purposeful tasks that make deliberate use of the physical and social context. The main challenge that might face the instructor in his journey to achieve this learning environment lies in how he could give the students enough motivation to become an active participant in the learning environment.

The FEDA Kids & Teens workshop, entitled: "Make your own Dream house", which was held inside the Architecture Department at Faculty of Engineering (FEDA), aimed at creating a learning environment through which the organizers and the participants of the workshop can learn. In other words, to create an ILE that reflects the interpretation of the beliefs of the instructor about how both the organizers and the attendants learn and what their interests are. This interpretation is done in an atmosphere of mutual respect and cooperation between all partners.

1.1 Problem Definition

The FEDA Kids & Teens workshop was intended to two different age groups: kids from 7-10 years old and teens from 11-17 years old. The main challenge was to create an adaptable learning environment that can involve all target groups (kids /teens) together with their instructors and organizers (professors, teaching assistants and students), while maintaining motivation and satisfaction among all groups. In other words: to simulate the real-life architecture experience on the experimental workshop.

1.2 The Main Purpose

This paper aims at presenting the experiences and lessons learnt during the preparation and execution of the FEDA Kids & Teens workshop, to offer a real-life case study that went beyond applying traditional methods of teaching and to reveal the keys of achieving an interactive learning environment. The paper gives an in-depth review of the case study of the workshop as an example of creating an ILE amongst all its participants. The purpose of this paper is twofold;

First: How the analyses and lessons learnt from this case study can be used in the design and evaluation of an ILE.

Second: How the study of this learning environment can provide further information about the variables that can influence the process of creating an ILE in teaching architecture in particular.

2. Methodology

The population for this case study included about 40 kids/teens who participated in the workshop, a stuff member (the main coordinator of the workshop), about 9 teaching assistants, a post-graduate architect who works on the theme of teaching architecture to young kids, and more than 80 under-graduate students from different educational years.

The objective of this paper is achieved through the analysis of the case-study workshop. The analysis is done on four main features as follows:

At first, the structure of the ILE is analyzed, where the main dimensions forming the ILE are revealed.

Secondly, the phases of creating the workshop are discussed in detail.

Thirdly, the strategies that were implemented to develop the ILE were explained. These included teaching methods, motivation tools, implementation and praising strategies. Furthermore, the end-products of participants as a follow-up of their personal development and their level of satisfaction were assessed.

Finally, two variables, that are believed to greatly affect the creation of ILE through this workshop, were detected and measured:

a- **The level of interaction achieved** throughout the phases of the workshop. This indicates how many types of stakeholders were involved in each phase. Figure (1) shows the types of stakeholders involved in the workshop and their roles.

b- **The impact of each stakeholder**, in terms of their importance in relation to each other. This indicates the degree of impact of each stakeholder's role in each phase relative to the other stakeholders.

c-

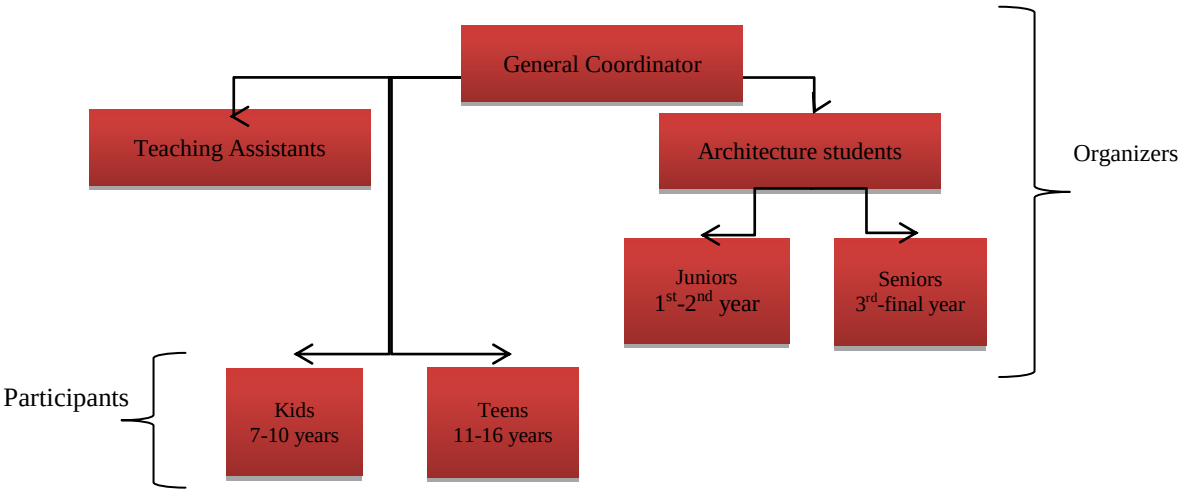

Figure (1): The stakeholders involved in FEDA kids/teens workshop

3. Structuring the Learning Environment

The design of the interactive learning environment in the kids/teens W.S. was based on five main dimensions, where each plays a critical role. These dimensions are illustrated in figure (2).

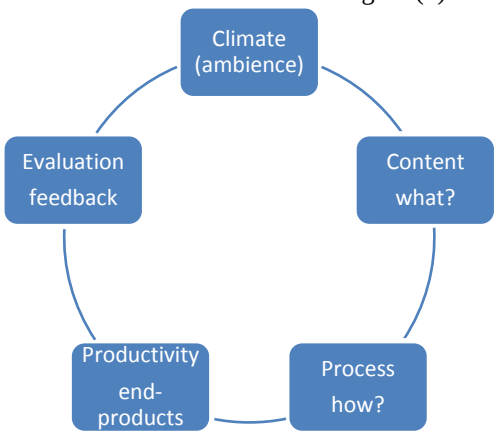

Figure (2): The five main dimensions of the ILE adopted

3.1 Climate (Ambiance)

The overall ambience or climate of the workshop was a resultant of three main constituents: the physical environment, the social environment and the time-based environment.

3.1.1 Organizing the Physical Environment

The physical environment of the workshop included setting the ambience in a way that makes it open, tolerant, comfortable, and safe. The objective of setting such climate was to achieve significant learning where all participants can interact, Figure (3).

Fig (3-a) Interior decoration emphasizes the tolerant, open atmosphere.

Fig (3-b) Choosing colorful open workspace to create a comfortable ambience.

Fig (3-c) Foam corners adhered to the corners of the tables for safety.

Fig (3):The ambience inside the workshop

The **space** was arranged in such a way as to encourage the interaction between the participants and the organizers (fig. 3-a), using stools and sitting in groups, each including about 5-7 kids/teens. The space chosen for holding the workshop was the final year design studio in the department of architecture; the studio **furniture** includes large red-colored tables, (fig. 3-b). **Safety** requirements were achieved through covering the sharp aluminum edges of the tables with foam, (fig. 3-c). The **materials**, including drawing tools (pencils, different color types, transparent sheets, cardboard, brushes, rolling sponges), modeling tools (foam sheets, colored paper, toothpicks, straws, play dough, etc.) were allocated on a central table in the studio were the organizers handle them to each group upon need.

3.1.2 The Creation of Social Environment

Creating the social environment was achieved through applying the workshop goals including **safety** regulations, where kids and teens were not allowed to use any tools or equipment (such as cutters, wax guns, etc.) that might cause injuries. Instead, the organizing teams were responsible for any process that involves the usage of sharp or electric-equipped tools.

The workshop goals also included achieving **respect** among all participants and organising groups. **Resposibilities** of each work group were clearly identified. Meanwhile, complete **cooperation** was sustained between all groups.

3.1.3 The Creation of Time- Based Environment

Creating the time-based environment depended on three main factors: **the first** was the workshop timetable, including the tasks to be achieved within the overall time of the event; **the second** was the kids/teens human needs for rest and snack time recreational activities, figure (4-a); and **finally,** appreciating individual differences among participants. The last factor was handled through adding extra activities that suit different age groups (including coloring sheets, origami art work…etc.), figure (4- b, 4-c).

Fig.(4-a): Face painting for kids and teens in recreational time

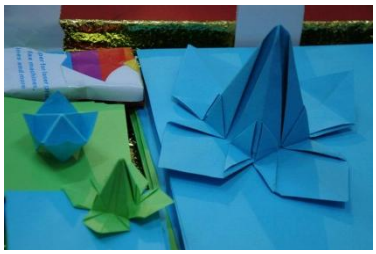

Fig. (4-b): Origami art-works

Fig. (4-c): Coloring worksheets on the theme "my dream house"

Figure (4): Extra activities during workshop time

3.2 Content (What)

The content of the workshop, or "what" it introduced, aimed at two objectives, one was declared, while the other was hidden. The first declared objective was to provide the participating groups with simplified knowledge about how to make their dream house. The second hidden objective was to create a learning environment through which each participant in the workshop (whether a kid, a teen or an organizing member) could interact and benefit most of it.

3.3 Process (How) [Teaching methods]

The process of how the content of the workshop was actually delivered was based on creating real-life situations through which all participants can learn. Teaching methods that were implied in the workshop were actually a blended number of methods that oriented both kids and teens regarding their different age groups, individual differences and cultural backgrounds. The stakeholders of the workshop were subjected to real-life situations, in different ways.

3.3.1 The Organizers

For the organizers, group work and rehearsals on an actual scenario of dealing with different age groups were performed, breaking the ice with them and training them on different activities that could be done with both age groups during the intervals between sessions. The main challenge the organizing team had to overcome was how to let the kids/teens understand both the work of an architect and the basics of architecture as a first step in creating their dream house.

3.3.2 The Kids and Teens

Kids and Teens were involved in real life situations in different means throughout the phases of the workshop:

- Some of the kids/teens participated in the workshop logo design; their designs were included with other suggested logos, where a vote was made by the organizing committee to choose the best design.
- Involving the kids/teens in the promotion for the workshop: a movie was made by a teaching assistant of the organizing committee to promote the workshop. It involved the participation of one of the teens who participated in the workshop.
- The story-telling approach was mainly used with the kids from 7-10 years old. This method has a long history of use in structuring, organizing and communicating human experience. It had a significant impact on the way the kids understood and used to come to conclusions. [4]
- Interactive narration, physical exercises and doing experiments were implemented on all age groups, as they involved interaction among all participants.

3.4 Productivity

In general, effective results are achieved when the climate, content and process are well structured, managed, and implemented. Thus this paper will further analyze the end-products of the kids and teens as a check of the effectiveness of the learning environment.

3.5 Evaluation (Feedback)

The feedback dimension is about the self-correction and evaluation of the effectiveness of created learning environment. The feedback data was gathered from both the workshop organizers and the kids/teens who participated in it. The latter were allowed to express their impressions either verbally to the coordinator of the workshop or by writing them on a large white sheet inside the workshop space. The organizers provided their feedback one day after the end of the workshop, they were asked to criticize the day openly on the internet group of the event.

4. Phases of Implementation of the Case Study

The coming part of the paper gives a deep analysis of the four main phases of the case study workshop: the planning phase before getting started, the initiation phase, the implementation phase and the closing phase.

4.1 Phase (1): Before Starting [Planning]

Before starting the workshop, two main concerns had to be efficiently planned for; these were the principles of classification of participants and the principles of delegating responsibilities to organizers.

4.1.1 Analysis of Factors Affecting Classification of Participants

Several factors affected the classification of the workshop participants, including:

a- **The individual progress of each participant**: where attention was given to developing appropriate tasks to each kid or teen. They were subjected to the challenge of making their dream house, meanwhile they were encouraged to express it in any means they want (plan, elevation, isometric). In addition, the organizing members were encouraged to understand the strengths and weaknesses of each participant during the starting phases and to take them into consideration while working with them.

b- **The cultural differences**, which affect the students' comfort level in working collaboratively instead of individually. This was handled through the strategies of breaking the ice (discussed later) and through designing the required tasks in both ways, individual and collaborative.

c- **The participants' conceptions of what it means to be intelligent**: as participants who want to look good rather than take the risk of making mistakes are likely to give up when tasks become difficult. [2] This issue was handled through adding competition in the final phase of the workshop, to encourage the participants to keep on the good work. Those who finish their houses properly were to put their products in unique remarkable sites inside a 3-D map.

4.1.2 Analysis of the Principles of Delegating Tasks

The process of delegating responsibilities to organizing team members was handled by the workshop coordinator and was based on the tasks required, which were derived from the objective and the schedule of the workshop. After determining the main tasks required throughout the different phases of the workshop, a number of teams were formed, where each team was addressed to a specific task. Then the organizers were allowed to pick up the team that they are interested to join according to a pre-set job description, their interest, their qualifications and their ability in dealing with kids/teens respectively.

4.2 Phase (2): Getting started [Initiation]

The initiation phase of the workshop involved three main tasks: theme selection, creating an interactive interface through internet and setting out the work groups to get started.

4.2.1 Selection of the Theme of the Workshop

The main theme of the workshop was "creating your own dream house". The idea of the workshop motivated all its participants strongly to concentrate and be highly interactive during the workshop.

- For the academic staff members, it formed an opportunity to show how their work as architects can participate in shaping the dream house of each kid or teen.
- For students, they had the motive of impressing the kids, and even attracting them to the field of architecture.
- For the kids/teens, they were motivated to form their own dream house, taking their own decisions, draw it, make it in 3-D form and finally at the end of the day impress their parents and colleagues.

4.2.2 Creation of an Interactive Internet Group

An internet group named "Box of ideas" was created by the coordinator of the workshop at the beginning of the preparation of the event to share with between different groups that have interest in the event. The members of this group have exceeded a hundred including teaching assistants, staff members and students of architecture from different years.

4.2.3. Formation of Work-Groups

A number of work-groups were created afterwards. The work-groups included the graphic design team, the interior decoration team, the 2-Ddrawings illustration and movies team, the layout and map setting team and the 3-D modeling team. In addition, the organizing team members were formed from all team members and other outdoor members as well.

a- **Graphic design team:** this team was responsible for the design of any graphics included in the workshop. Their work involved the design of the logo, the poster, the banners and the certificate of honor presented to the participants. Figure (5) shows the selection process of the logo of the workshop. The selection process was done after a vote, where the two competing logos were then evaluated in terms of their aesthetics, symbolism and economics of fabrication when turned into medals using laser cutters.

A design proposed by 4th year student (The adopted one)

Design proposed by 1st year arch. student

A design proposed by the coordiantor

Figure(5): The process of logo design and selection in the workshop

b- **Interior decoration team**: This team was responsible for making colorful decoration ideas that are related to the theme of the workshop. Their goal was to create an intimate colorful atmosphere for kids and teens to work in, figure (6).

Figure (6): The end-product of the interior decoration team

c- 2-D Drawings, illustrations and movie-making team: This team was basically concerned about all forms of 2-d drawings and illustrations that were required in the workshop. Their work included drawing a story in a cartoony-mode for the kids, making illustrations that show the different forms of houses throughout history and illustrating some stories related to architecture.

d- Layout and map setting team: This team was responsible for designing a map that could stand all the 3-d models of the participants relative to the scale of the required model. They were responsible for designing the layout of this map in order to teach the kids and teens the concepts of urban design in a simple way. The layout included main roads, secondary roads, gates for the neighborhood, points of attraction and some landscape elements, figure (7). This team had a challenge to make an attractive, real-like layout to encourage the kids and teens to finish their work and locate it in one of the remarkable sites inside the map.

Figure(7): The map created for the workshop

e- 3-Dmodeling team: This team was responsible for making sample models from different materials that the kids and teens could use in making their dream house. A number of modeling materials was chosen according to their availability, ease of use relative to each age-group and their modeling capabilities. The team members made a lot of research work on the different forms that could be made of the chosen materials. The materials selected included play dough, foam sheets, pre-cut foam units, linear elements (toothpicks and straws), folded paper house-models and plain square sheets for origami work. Figure (8) shows different samples set by the team for different types of materials.

Figure (8): Samples of the modeling units

f- Organizing team: As discussed before, the organizing team involved some members from other work-groups, in addition to other members who were interested to get involved on the day of the workshop. The team members were distributed among the kids and teens throughout different sessions. They had to perform different tasks, including instruction, drawing, discussing the ideas, making physical exercises with kids, orienting the participants, motivating them and finally taking care of safety and security issues.

4.3 Phase (3): Detailed Plans, Concepts, Ideas (Implementation)

The implementation of the workshop stared with an experiment on making a virtual workshop, which aimed at making sure that all the objectives of the day are realistic and achievable. Then the concern was how the kids and teens would get introduced to each other and to their instructors.

4.3.1. Making a Virtual Workshop

In order to design effective environments for learning, the influence of the kids/teens perceptions of the learning environment on their learning strategies should be considered. [5] In order to achieve that, the coordinator needs to know how kids/teens can learn architecture, and how specific architectural concepts are acquired, in addition to checking how the kids/teens would accept the theme of the workshop and the difficulties they might encounter during making their dream houses. The experiment was done on a number of kids and teens that were equivalent to 10% of the actual number of attendants. The conclusions of these simulations have led to the following:

Firstly: the point of interest for the kids obviously varied from that of teens. Kids focused on coloring; they could easily understand the concept of plan and section through cutting colorful fruits and drawing what they saw. Teens could be encouraged to draw plans and sections of a real 3-d open model.
Secondly: the ability and degree of concentration of kids on rules was weak, which suggested giving them shorter tasks that took less time (coloring, making parts of a house, furnishing the house). In addition, kids needed extra activities, like making origami shapes and forming play dough.
Teens, on the other hand, could be introduced to the concept of drawing on transparent sheets, where they could modify their drawing using the concept of layering.

Thirdly: the means of expression: when the kids were asked to describe their dream house they tried to describe it in terms of the vocabulary of shapes they know, for example, a cube, star, diamond; while the teens concentrated on the functions inside the house and the place it will be located in (the surrounding environment).
Finally: kids/teens participating in that experiment were allowed to criticize the design of their own houses which formed a good opportunity for them to interact. The workshop made use of the results of that experiment, especially when setting the interactive presentations for both target groups by asking them questions like: "what do you like most about your house?", "where do u prefer to live?" and "what is the worst thing you want to change in it?"

4.3.2 Breaking the Ice

The "breaking the ice" approach aimed at creating an effective interaction between the organizers and the kids/teens at the beginning of the workshop. The kids/teens were introduced to each other and to the organizing team in an indirect way. Meanwhile, there was a need to differentiate between breaking the ice of young kids from that of teens, so two different strategies were adopted for the two target groups.
The first strategy involved using the name grid for kids, where young people were divided into groups of four. Each group used paper and pens. They were asked to draw a grid on which they write their forenames. Each team was given five to ten minutes to write down as many words (three letters or more) that they can make only using the letters in their names. When time is up each team summed up their score by adding a point for every word they got.
The second strategy aimed at socializing with the teens through drawing a self-portrait. The students drew themselves then their drawings were hanged up for the whole class to see. Then they tried to guess who the artists were for each picture.

4.3.3 Motivation Session (presentations, storytelling, movies)

The motivation session aimed at transferring knowledge to kids and teens in an indirect way so as to motivate them to start thinking about what their dream house could look like in the following session. That session dealt with five main issues: the basics of architecture, the role of the architect, "what is a house?", "how a dream-house could look like?" and "what are the principles of architectural drawing?" Each of the five issues was introduced to kids and teens in different strategies in order to get along with each target group.

- **First: Kds**

a-The basics of architecture were introduced to the kids through physical exercises, where they could express the action of each architectural element through their body, as shown in fig (9).**[6]**
b-The role of the architect was exposed to kids in an indirect way through a story-telling approach. They were told a story about a little kid who wanted to make a shelter to his cat, figure (10).
c-"What is a house?" and "how a dream-house could look like?": This was answered through a movie made from parts of different amusing cartoons that included different forms and types of houses. The kids were asked to interact with the movie, add their opinions about the houses they saw and even suggest solutions to some problems. (For example: "how can we ever get inside an apartment house without the existence of stairs?")

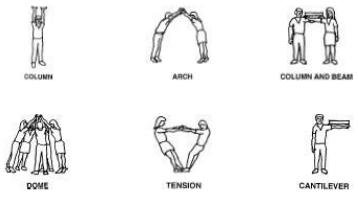

Figure (9): Showing the action of architectural elements through physical exercises[6]

Figure (10): The story-telling session for kids

Figure (11-a): The concept of section

Figure (11-b): Organizers showing kids the concept of the house

Figure (11-c): The concept of plan

Figure (11): Models to illustrate the concept of a house to kids 7-10

- **Second: Teens**

a-**The basics of architecture and the role of an architect:** The teens were offered an interactive narrative lecture that included a narrative presentation on the basic elements of architecture. They saw movies designed by the organizing team to express the role of the architect.

b- **"What is a house?" and "how a dream-house could look like**?": In order to let the teens answer that question, they were shown some panoramic videos, shown in fig (12), which helped in visualizing the spaces of the house. Additionally, different types and forms of houses were shown to them so that they could help them imagine their dream house.[7]

Figure (13-a): Kitchen area

Figure (13-b): Bedroom

Fig (12) Panoramic videos showing different spaces inside a house[7]

c- The principles of architectural drawing: The teens were introduced, in class, to the basics of architectural drawing. They were first shown 3-D models for a typical house; the models were made in a way that they could open them in plan and in section, figure (13). They were then helped by the organizers to draw a plan and a section of the 3-D model house on transparent sheet.

Figure (13): Teaching teens the principles of architectural drawing

4.4 Phase (4): End-Products [Close out]

This part of the paper describes the closing phase of the workshop. That phase included the end product of both kids and teens and honoring them in various ways.

4.4.1 End- Products

The end products of kids and teens in the first session of the workshop took the form of 2-d drawings were they used colors to present their work on an A3 white sheet, figure (14). Their illustrated dream houses were hanged on the back walls in order to be seen by all participants, figure (14-a).

In the following session, after the workshop coordinator and teaching assistants analyzed their work and categorized it, the kids and teens were offered suitable materials to make their 2-d house come true through modeling. They all presented different ideas whether in form (star house, boat house, figure (14-b), origami house, (figure 14-c), pitched or domed house, figure (14-d) or in the surrounding environment (house in space, on an island, inside the sea) for their dream houses.

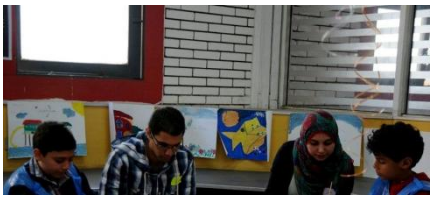

Figure (14-a) The 2-D end product hanged on the surrounding walls inside the workshop

Figure (14-b) Sample of the 2-d drawings of the dream house - boat house

Figure (14-c): Origami house

Figure 14-d: Simple pitched/domed house

Figure (14- e): The finalized products of both kids and teens on the general layout

Figure (14): the end-products of the workshop

4.4.2 Honoring of Participants

All the participants were honored for their valuable participation. The organizers of the workshop together with the kids and teens were all offered certificates of honor in addition to a bracelet that had the Egyptian flag on it. The kids and teens were also given a medal made by laser cutter that has the logo of the workshop by the end of the day, figure (15).

Figure (15): Honoring the participants at the end of the day

5. Findings of the Case Study

The findings of this paper aim at answering the question: "How far the Case study workshop succeeded in creating an efficient interactive learning environment?"

5.1 The Workshop Organizers

Through group work and rehearsals the organising group developed their interpersonal skills, negotiation skills, leadership skills and other skills related to architectural design, including 2-D drawing, making physical models, art-work, movie making, research work and other related skills. It is worth saying that all the organising members had the chance to participate and discuss issues on equal basis, regardless of their age or affiliation.
Finally, an Online Evaluation of the day was conducted on the event group, where nearly all of the organizers who shared in the workshop showed great interest in joining other similar events.

5.2 The Workshop Participants (Kids/Teens)

The participation of some of the kids/teens in some of the activities related to the preparation of the workshop, like the design of the logo and acting in the promotion video of the workshop, gave the participating kids/teens a sense of sharing and emphasized interaction between them and the other members; in other words, they felt that they were part of the event. Their degree of satisfaction was detected through their own impressions about the day. Most of the kids, by the end of the day, asked: "When is the next workshop?", while some others helped the organizing team in cleaning up the place of the workshop, which showed great feeling of belonging to the place.

5.3 Creating an Interactive Learning Environment

This paper suggests that throughout the phases of preparation of this workshop, the desired interactive learning environment was actually created between different stakeholders. Table (1) shows the level of interaction throughout the phases of the workshop and degree of impact of each stakeholder; it also offers an analysis of the detailed roles performed by each stakeholder during the interaction process. The color code is classified into 3 main categories: High level of interaction (80% or more of stakeholder groups got involved) in red, Medium (65-50%) got involved in green and Low (less than 50%) in yellow. The degree of impact of each stakeholder role is coded as follows: *** (high degree), ** (moderate degree) and * (low degree).

Conclusions

- The workshop was able to create interaction throughout all its phases, where the highest level of interaction achieved was evident in the implementation phase (85% of the stakeholders got involved). While the level of interaction in the rest of the phases was of medium range (50-65% of the stakeholders got involved).
- Participating in the workshop was based on creating a communication channel for student to student, student to teacher (staff members) and organisers (students and staff members) to kids/teens collaboration. The degree of impact of the organisers was higher (relative to participants) at the beginning phases of the workshop, while that of the participants' impact was higher during the implementation and the closing phases, Figure (16).
- The added value for each participant brought by that form of learning, together with the knowledge about the issue of the workshop, was involved in benefiting both personal and institutional aspects.

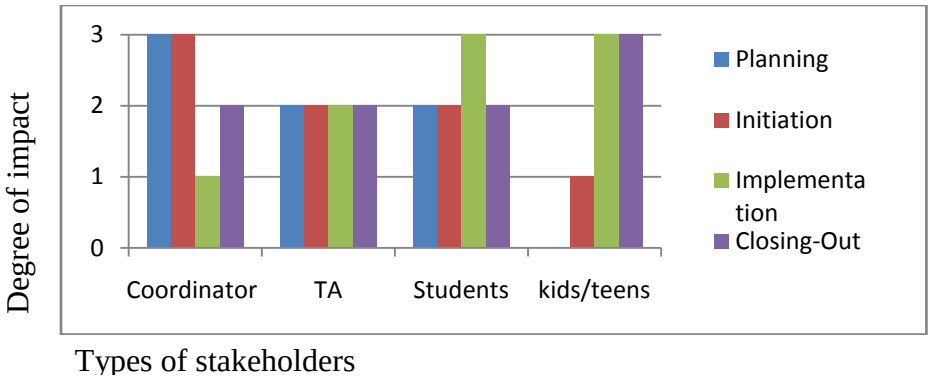

Figure (16): the relationship between the stakeholders and their degree of impact throughout the phases of the workshop.

Table (1): The level of interaction throughout the phases of the workshop and degree of impact of each stakeholder

Phase of implementation		**Detailed roles**	**Stakeholders involved**					
			Staff members		**students**		**participants**	
General	Sub-phase		Coordinator	TA	Junior	Senior	kids	Teens
Planning	Classification of participants	Research work	***	*				
	Delegation	Job description	***	**	*	**		
	Selection of workshop theme	Research work	***	**		**		
	Creating an internet group		***	*	*	*		
	Forming work-groups	Logo design	**	*	*	**		*
		Interior design	*		***	**		
initiation		2-Ddrawings/map	*	**	***	**		
		Movie making	*	***				**
		3-D modelling	**	**	*	***		
		Organizing	***	***	***	***		
	Making a virtual workshop	Doing experiment	*		***		***	***
	Breaking the ice	Playing games	*	*	***	*	** *	
		Drawing self-portrait	*	**		**		***
	Motivation	Physical exercises	*	*	***	*	***	
implementation		Story telling	*			***	**	
		Interactive narration	*	***		***	**	**
		Doing experiments	*	*	***	***	*	*
		2-D drawing	**	**	**	**	***	***
		Extra activities	*		**	***	**	**
	Evaluation of 2-D products		***	***				
Close- out	Production of 3-d models		*	**	**	**	***	***
	Honouring the participants		**	**	***	**		

8. References

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