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## EFFECTS OF SOUNDS AND LYRICS IN BRICK TILE INSTALLATION; INNOVATIVE METHODS OF ARCHITECTURAL EDUCATION

Alireza Mashhadimirza

Faculty of Architectural Engineering, Parand University, Iran, alirezamashhadimirza@yahoo.co

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### Abstract

This qualitative paper investigates a new method of architectural education in architecture studio monitoring in the field of brick tiling. It covered a background to the related fields based on art and design methods, which have been used in Iran dating back thousands of years until present. As a research methodology, a deep observation on conventional method of carpet-weaving workshops, shaped the first steps of this article. In this method, the overall plan that includes a floral carpet to ranges of square pixels and color finds their own characteristics as paint, rows and columns. In these studios, someone took the coded map and sang respectively, row after row to be applied by others. This paper aimed to apply similar mix methods of coding by using songs for tiling the bricks. Iranian architecture students covered the scope of study in three different phases. The method of "Ava Chideman" is derived from the weaving technique and the combination of sounds and installation of tile works, which its results have been analyzed in this paper. Researcher believed this paper would help current and future designers and researchers. Additionally, this methodology aims to minimize the expert's role to produce safe and vernacular built forms and economical housing, while trying not to compromise on quality and freedom of local needs.

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# EFFECTS OF SOUNDS AND LYRICS IN BRICK TILE INSTALLATION; INNOVATIVE METHODS OF ARCHITECTURAL EDUCATION

A. MASHHADIMIRZA<sup>1</sup>

## ABSTRACT

*This qualitative paper investigates a new method of architectural education in architecture studio monitoring in the field of brick tiling. It covered a background to the related fields based on art and design methods, which have been used in Iran dating back thousands of years until present. As a research methodology, a deep observation on conventional method of carpet-weaving workshops, shaped the first steps of this article. In this method, the overall plan that includes a floral carpet to ranges of square pixels and color finds their own characteristics as paint, rows and columns. In these studios, someone took the coded map and sang respectively, row after row to be applied by others. This paper aimed to apply similar mix methods of coding by using songs for tiling the bricks. Iranian architecture students covered the scope of study in three different phases. The method of "Ava Chideman" is derived from the weaving technique and the combination of sounds and installation of tile works, which its results have been analyzed in this paper. Researcher believed this paper would help current and future designers and researchers. Additionally, this methodology aims to minimize the expert's role to produce safe and vernacular built forms and economical housing, while trying not to compromise on quality and freedom of local needs.*

## KEYWORDS

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## 1. INTRODUCTION

To form the whole research concept of the mentioned innovative methods of architectural education towards brick installation into the one identity, a scenario has been shaped up by providing a brief background of study. The significance of tile work in Persian architecture ascends from two main factors; first, the characteristics of the simple clay bricks used in construction to confront the necessity of being weatherproof, and secondly the requisite to ornament the buildings. Tiles were used to adorn monuments for ages in Iran. It covers the variety of glistening, multi-colored tiles, coating the walls, domes and minarets of mosques, and decorating the edges of every kind of building from schools to government offices and residential buildings. By noticing the importance of brick in Persian architecture, this paper focused on brick-tiling education among current architecture students. Idea of this method looked back on traditional carpet-waving methods with sounds and lyrics too and connected this method to brick installation. In the following, researcher referred to the history of carpet weaving for a deeper understanding of the research flow.

The precedence of carpet-weaving industry has a history about thousands of years in my homeland. The handmade Persian carpet is considered as a unique one all around the world, In the light of texture, design and color blending. First step in carpet-weaving works is setting the warps on top of the "Dār", a specific carpet framework, and then carpet-weavers, which are almost women, start making it. They tie warps with colored woolen or silky strings in a two-by-two basis,

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<sup>1</sup> ALIREZA MASHHADIMIRZA

Faculty of Architectural Engineering, Parand University, Iran  
alirezamashhadimirza@yahoo.com

actually in range of horizontally tie knots of carpet in terms of certain plan. Afterwards they pass number of “weft” on the top of knot’s row throughout warps alternately. Then they beat to press and condense the knots and strings with a heavy metallic comb like tool. The next step is to snip and trim the row with a special shear. These works would be done for the next row repeatedly and the carpet completes gradually. The main important point about carpet weaving is its “creative technique and structure”. Usually the carpet plan that is consisted of geometrical forms would transform to very fine pixels on a checkered paper. Every single pixel would be determined by its unique color and illustrate a knot. The instructor would order them loudly according to proper color and knot’s position of each row and the carpet weaver would follow the instruction through listening as proper combination of songs and weaving shown in figure 1.<sup>2</sup>

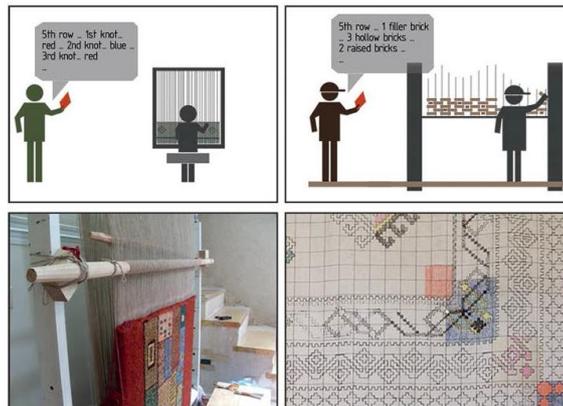


Fig. 1 carpet weaving according to the singing of the map

According to the cultural value, the mentioned method of combination of instructor’s song and weaver’s worker fit the both work process and environment. It has been stated that dated back in Persia professional architects tasked and commanded the labors during some specific works via a song. As matter of forming the design methodology of the research, two building were studied as sample cases for deeper understanding of Iran contemporary method of tiling regardless of installation method. The research followed by introducing three phases of the mentioned lyrical method of tiling education to Iranian architecture students.

## 2. IRANIAN CONTEMPORARY BRICK ARCHITECTURE WORK

In this section, researcher surmised Iranian current brick tile work into presenting two projects. The both projects were residential and located in Tehran. The following focuses deep on each projects accordingly.

### 2.1 Brick Pattern House

Considering limitations on one hand and Architect's design intentions to give a clear architectural message to the users of space on the other, designer has made a decision to concentrate the effort on the exterior envelope of the building. Interior design reminded nothing more than a functional space aesthetically related to the façade. In order to recall the traditional architecture, brick has been used as the main constructional material. In addition, to cover the whole façade in contemporary form of traditional “Mashrabiya” to mitigate the glaring sun light of Tehran. Designer’s team worked a tridimensional brick wall, which also has a cultural value. Based on the local culture, privacy is on the top list of priorities for space users especially in residential projects, which is shown in figure 3.

To confront the users’ environmental and psychological need and necessity of view and openings, designer applied this semi-transparent brick wall. Respecting to client budget-conscious, design team needed to create a method, which did not produce many executive

<sup>2</sup> -<http://www.hawzah.net/fa/article/view/5080>

drawings and did not require a great amount of time for architectural supervision. Therefore, it applied a new and extremely easy mean of communication based on a table including all needed information for creating the facade. This is something similar to the instructions traditionally recited in the carpet workshops during the work time to coordinate the activities of several weavers working on the same carpet. This instruction named "method 23" as everything is associated with the number 23. 23 brick rows, 23 sliced bricks, 23 boxes of bricks, and 23 columns of structural supports.

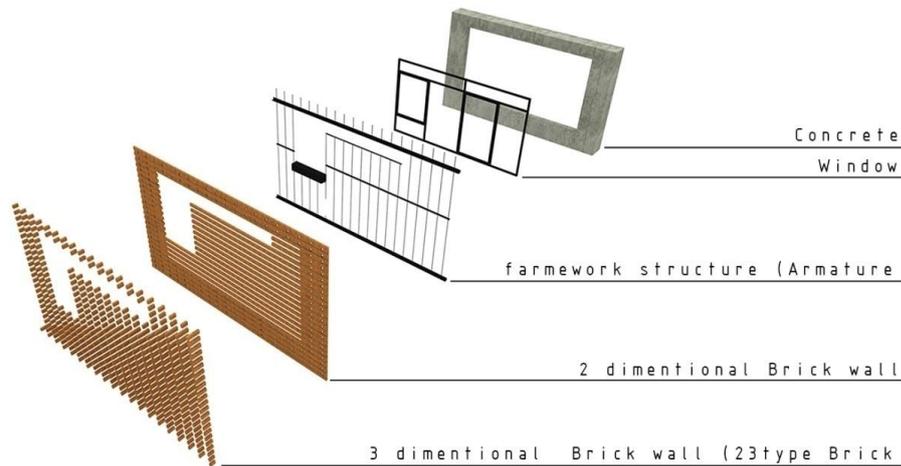


Fig. 2 façade details



Fig. 3 Brick Pattern House

Reference: Author

### 2.1.1 Method 23

This method application is to join the pieces of a simple puzzle of brick tiles. Each tile has a code to identify the location and orientation. The complete instruction was included in one A4 page given to the workers. According to this instruction, the workers received 23 brick boxes. Each box contained the numbered and sliced bricks. As it is shown in the chart, for example there were 23 bricks in the first box numbered from one to 23. All the bricks were drilled as shown in figure 4. In each floor, there were 23 boxes. The worker exposed the box no.1 and put the bricks in to the framework starting from number one and ending to tile 23d. It needed to be explained the method to the workers, but once they understood the trick, the work became simply applicable.

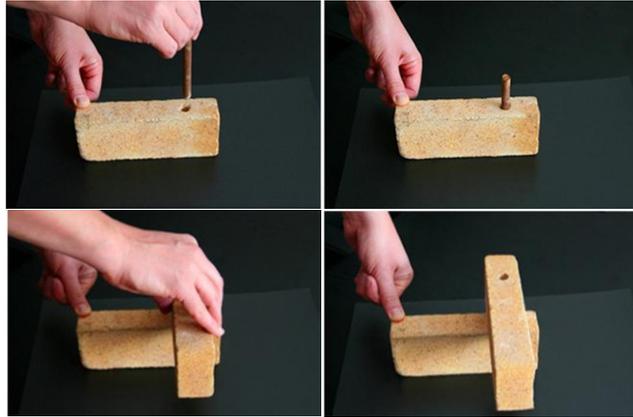


Fig. 4 Installation  
Reference: Author

## 2.2 House of 40knots

Persian carpets are world notorious. Also as mentioned earlier bricks have a strong relationship with Iranian historical architecture. In this residential building, ‘the house of 40 knots’, the two entities were fused into a contemporary façade that appeared as a collection of intricately interwoven modules. In textile factories, two people work together to make a carpet – one reads the instructions, while the other sits behind the scaffold and makes the braids. Instructor reads the instructions, usually with a rhythm, and like a song coding the colors. Those instructions are usually drawn on checkered papers. The handmade exterior of this residence was also made using a similar system shown in the figures 5, 6, 7 and 8. One craftsman started reading the codes and the other placed raised, filler, and hollow bricks in corresponding to the supporting bars between L profiles. Due to this technique, there was no need for phase drawings and the construction sequences could be performed through a series of simple, localized labors. Workers could follow the clay blocks row by row without having to understand the concept of whole façade as earlier shown in figure 1.<sup>3</sup>

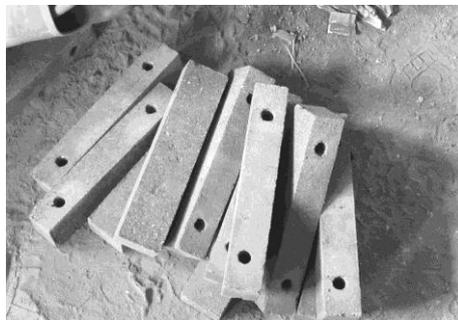


Fig. 5 Preparing bricks for brickwork  
Source: Author March 2013

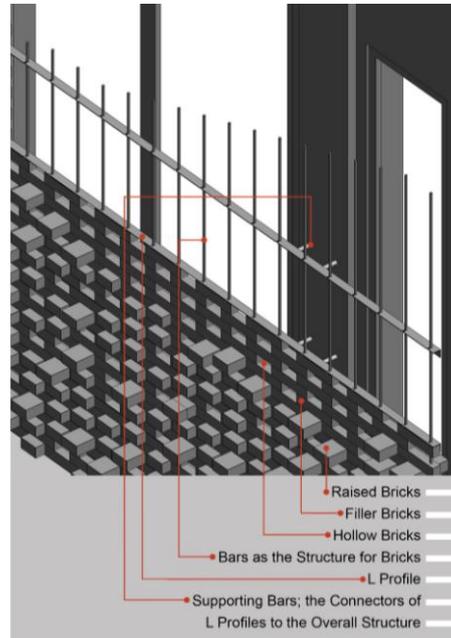


Fig. 6 Façade detail

<sup>3</sup> -<http://www.designboom.com/architecture/habibeh-madjabadi-alireza-mashhadimirza-house-of-40-knots-bricks-persian-carpets-tehran-iran-11-02-2014/>



Fig. 7 North-east view  
Source: Author Nov 2013



Fig. 8 Interior space  
Source: Author Nov 2013

### 3. EDUCATIONAL WORKSHOP AND “LYRICS OF BRICKS” METHOD

As mentioned earlier in this qualitative paper, the method of songs and lyrics application on brick tiling education has been completed in three phases of three different workshops and sample students were taken from scope of studies accordingly. The schedule of the workshops has been shown below in table one and tow.

Table 1. Workshop Schedule.  
Reference: Author

Day 1 & 2	Activity
1	Theory training courses on “brick’s design and execution method”
2	Start designing by software
3	Modelling and shop-drawing
4	Arrange shop-drawing executive instructions based on carpet-weaving technique

Table 2. Workshop Schedule.  
Reference: Author

Day 3 & 4	Activity
1	Transforming executive instructions into brick prototype and brick installation



Fig. 9 training session, First day of workshop in Andalib traditional house, Isfahan, Iran  
Source: Author

### 3.1 Research Aims and Objectives

Architectural education plays an important role for the future of architects. This educational method tried to covers the following aims by providing experimental workshop for student to go through semi structured real life project. The aims are:

- 1- Experiencing the process of design to construction on a modular one-by-one base.
- 2- Concentrating on local architectural values and concepts.
- 3- Documentation of the theoretical and practical procedures.
- 4- Time management from the beginning of design process to the end of construction of real samples.
- 5- Establishment of a design guideline for the student to work based on the lyrics.

## 4. EDUCATIONAL WORKSHOP SYSTEMATIZING DESIGN AND CONSTRUCTION

Considering both methods of low-tech and high-tech brick tile installation, most proper method has been applied during the workshop. Based on the project requirements, due to the competitive economy besides low wages of laborers, usually the low-Tech method is suggested. In low-tech method the design would be transformed to a 3D model then would be systematized and executed by labor force. However, in High-Tec method a robot according to the systematic software may do it. By noticing both methods strength and weaknesses, researcher applied the first method, which is more suitable in occasion of educational matter. In the following, a scenario of the educational workshop has been introduced accordingly:

### 4.1 Design and modeling

Senior trainer in workshop teaches method of design and execution by brick then students would model their proposed design by means of 3D software. Afterwards they would Analysis 3D design.



Fig. 10 Training session, First day of workshop in university of Tehran, faculty of Architecture  
Source: Author



Fig. 11 Modelling and shop-drawing process, second day of workshop in university of Tehran  
Source: Author

#### 4.2 Analysis

The analysis of design means transforming a 3D design or plan into a smaller component, which is sole modular brick. Naturally, in numerous designs there would be various vision and different way of putting the bricks in the right position. Considering that brick is a cube with six surfaces, every surface in traditional architecture has a sole and unique name. Therefore, the position would be known by its sole name. The list of brick's six surface is:

“Kale”, “Rāsteh”, “Nareh Rāsteh”, “Nareh Khoftah”, “Nareh sar”, “Herreh”

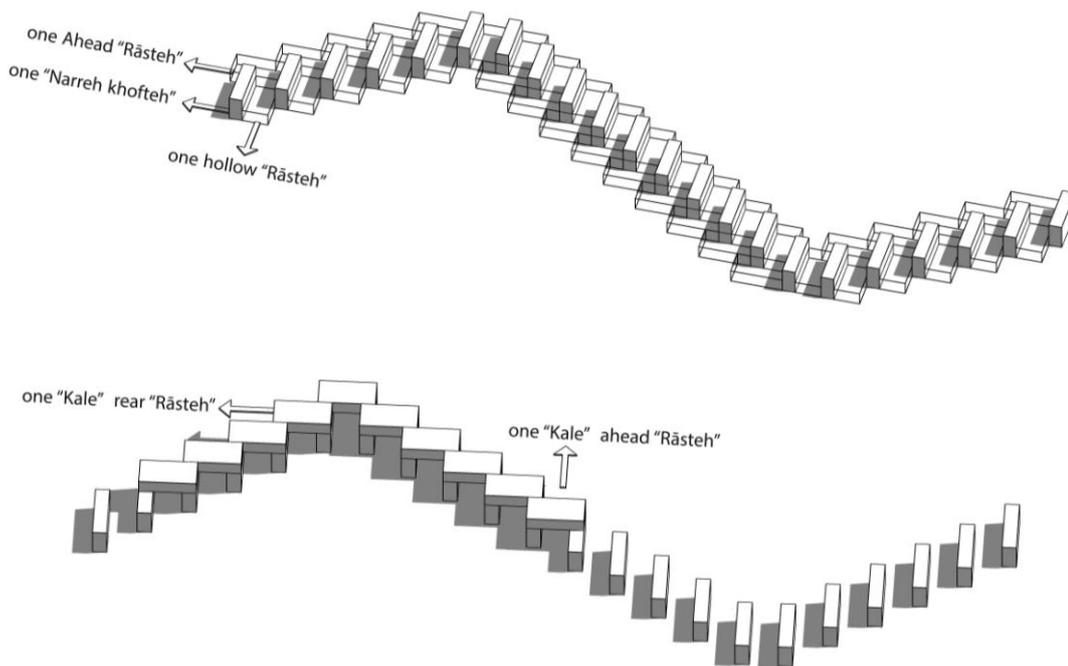


Fig. 12 diagram of Prototype A  
Source: Author

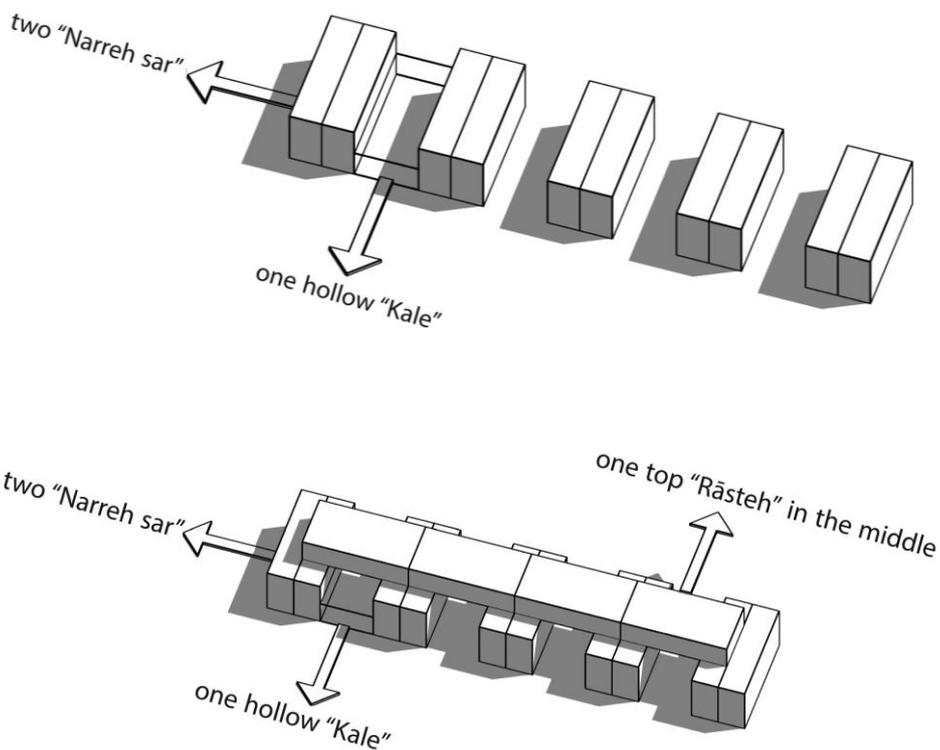


Fig. 13 diagram of Prototype B  
Source: Author

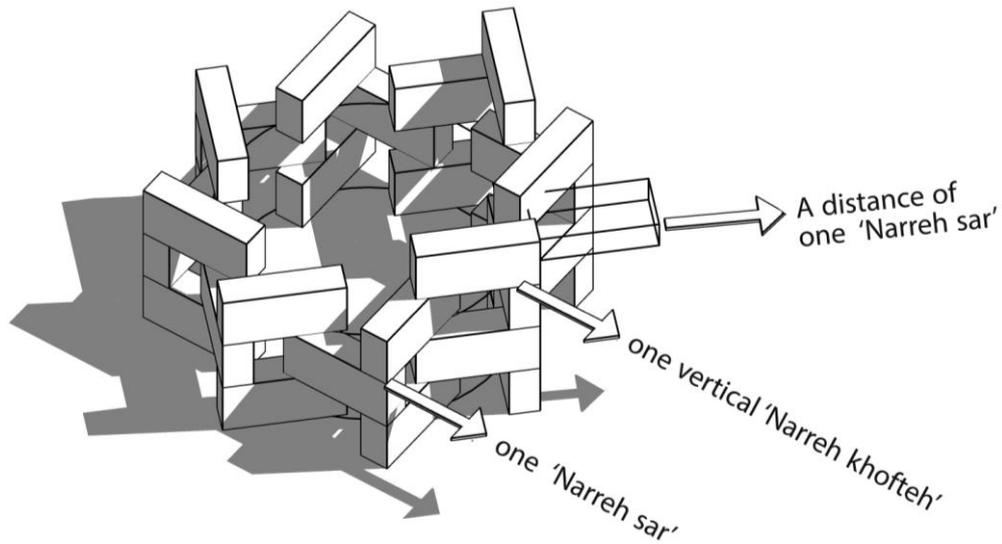


Fig. 14 diagram of Prototype C  
Source: Author

These names are based on bricks position on spectator's sight. Indeed, every brick would be recognized by its position towards the spectators. First, every group of students would present their general plan throughout a sole modular brick design. Then due to the position, each brick in each row would be named as a specific brick. Consequently, each row would be considered as a series of sixtieth brick terminology. For instance, a raw could be considered as follows: One Kale, one Narreh sar, one Narreh Rāsteh, one Narreh khoftteh, one Herreh, one Rāsteh.

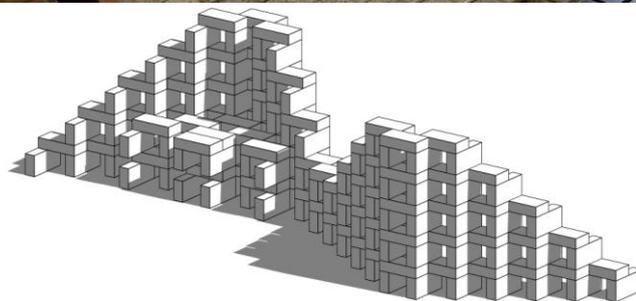


Fig.15,16 Prototype A; a place for sitting, as a result of workshop in Andalib traditional house, Isfahan, Iran  
Source: Author

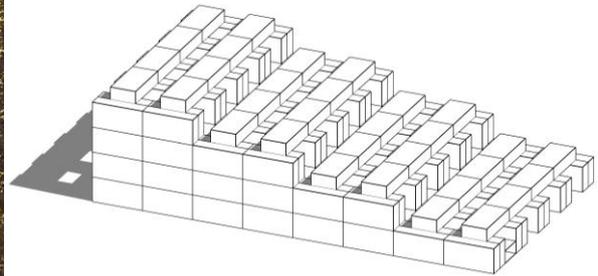


Fig.17,18 Prototype B; as a stair, workshop in Andalib traditional house, Isfahan, Iran  
Source: Author

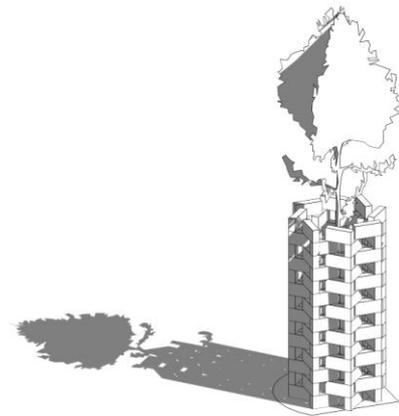


Fig. 19, 20, 21 Prototype Workshop in Andalib traditional house, Isfahan, Iran  
Source: Author

In this manner, the installing rows would be transformed to a series of specific terminology. Thus the text, which is consist of specific terminology like a song would be read via one parson and the others would install the brick while listening to the lyric.

The student indeed transforms the design to text by means of transforming design details into terms meanwhile text would be transform to lyric and lyric would simply lead them to brick installation.

## 5 CONCLUSIONS

Having an experience of academic teaching for the university level of students as future architects, the current method of architectural education can be frightening, typically demanding that cause students to feel entering unknown world. Therefore, researcher tried to confront the issue by applying experimental workshops. These workshops were completed in 3 phases. It aimed to explore more on architectural education creativity. By integrating songs, lyrics and simple instructions into the local and non-educational labor powers, the priceless and well-designed carpets have been woven for so many years. The method of “Ava Chideman” illustrates that this way can be used in architecture and local people can create numerous architectural spaces, surfaces and forms simply through this method. In addition, it may be localized or developed innovatively. Researcher believes that this project would help current and future architecture and educational systems accordingly.

## REFERENCES

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- [Http://www.hawzah.net/fa/article/view/5080](http://www.hawzah.net/fa/article/view/5080)