



ERGONOMACALLY DESIGN WORKSHOP: CERAMICS

A REPORT

SUBMITTED BY:

ANSHUL

REGISTRATION NO-11306631

SECTION -A1336

M.DESIGN IN INTERIORS AND FURNITURE DESIGN

SUBMITTED TO:

MISS ANURADHA KUMARI

Lovely Professional University, Phagwara, Jalandhar-Delhi G.T. Road, national highway-01,
Punjab 144411 Phone :1800 102 4431

CANDIDATE’S DECLARATION

I hereby certify that the work which is being presented in the dissertation entitled **“ERGONOMICALLY DESIGN WORKSHOP: CERAMICS”** in the partial fulfillment of the requirements for the award of the **Master of Design in Interior and Furniture Design** and submitted in the LSAD of the Lovely Professional University, Jalandhar, is an authentic record of my own work carried out during the period from **year 2017** to **year 2018** under the supervision of Ms. Anuradha, Assistant Professor, Department of Product and Industrial Design.

The matter presented in this thesis has not been submitted by me for the award of any other degree of this or any other University/Institute.

Anshul
SID - 11306631

Date:-

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Ms. Anuadha
(Supervisor)
Assistant Professor
Department of Product and Industrial
Design

ACKNOWLEDGMENT

I am grateful to Lovely Professional University, Jalandhar for providing this opportunity to carry out the present thesis work. Starting on logical note, I take this opportunity to express a deep sense of gratitude and thanks to Ms. Anuradha, Assistant Professor, Department Product and Industrial Design, for supervising the thesis. Without their wise counsel and able guidance, it would have been impossible to complete the thesis in this manner.

The constant discussion and help received from Ms Apurva, Assistant Professor, Department the Interior and Furniture design department has been of great help in carrying out the present work and is acknowledged with reverential thanks.

I am also grateful to Staff of the Interior and Furniture design department for their intellectual and administrative support during this research work.

I wish to express my indebtedness towards my family, who have always been my source of strength and whose affection and patience enabled me to complete this dissertation.

Above all I express my deep regards to the ALMIGHTY for his blessings and spreading pure love in all kinds of this beautiful nature.

Anshul
SID= 11306631

TABLE OF CONTENTS

CANDIDATE’S DECLARATION	i
CERTIFICATE	i
ACKNOWLEDGMENT	ii
LIST OF FIGURES	vi
LIST OF TABLES	vii
LIST OF ABBREVIATIONS	ix
ABSTRACT	x
CHAPTER 1 INTRODUCTION	1
1.1 Introduction	1
1.2 History (Background)	1
1.3 Objective of the workshop	2
1.3.1 Cognitive objective	2
1.3.2 Psychomotor objective	2
1.4 function of the workshop	3
1.5 Ceramic workshop safety	3
1.6 Ergonomics in workshop	4
1.7 Types of Ergonomics	5
1.8 Aim of Ergonomics	5
1.9 Principal of Ergonomics	6
1.10 Working environment safety	6
CHAPTER 2 LITRATURE REVIEW & CASE STUDY	8
2.1 Literature review	8

2.2 Live case study	10
2.2.1 Pottery workshop	10
2.2.2 Pottery workshop	12
CHAPTER 3 OBJECTIVE OF THE STUDY	14
CHAPTER 4 METHODOLOGY & CONCLUSION	15
4.1 Methodology	15
4.2 ceramic workshop (LPU)	16
4.3 Analysis of the workshop on the basis of ergonomics	18
4.3.1 Self-observation	18
4.3.2 Survey	19
4.4 Problem formulation	21
4.5 design proposal	22
4.5.1 Sketches	22
4.5.2 2 D	25
4.5.3 3D	29
4.6 Conclusion	31
REFERENCES	32

LIST OF FIGURES

Figure No	Title of Figures	Page No.
1	Entrance of the collage	10
2	Raw material area	10
3	Manual sculpting area	10
4	Open working area	10
5	Dow making area	11
6	Storage rack	11
7	Pottery wheel	11
8	POP slab for clay drying	11
9	Tub for clay mixing	11
10	Kiln for baking products	11
11	Light ventilation through ceiling	12
12	Light ventilation north side	12
13	Entrance of the workshop	12
14	Sheet working area	12
15	Display area	13

16	Working area	13
17	Flow chart of the methodology	15
18	The entrance of the workshop 8C-104	16
19	Working area of the workshop	16
20	Working area	16
21	Working table	16
22	Exposed ceiling of the workshop	16
23	Display rack	16
24	Storage rack	17
25	Storage area	17
26	Storage rack with locker	17
27	Wash basin area	17
28	Clay tank	17
29	Storage area	17
30	Chart shows the age group of people using workshop	19
31	Chart shows the sex ratio using workshop	19
32	Chart shows the ratio of student/faculty using workshop	19

33	Chart shows the visiting in the workshop	19
34	Chart shows the furniture related inconvenience	20
35	Chart shows the ventilation related inconvenience	20
36	Chart shows the discomfort using workshop	20
37	Chart shows the cleanliness related inconvenience	20
38	Concept of the furniture for manual wheel working	22
39	Concept of the trash box for waste management of clay/pop	23
40	2D planning of the workshop	24
41	Flooring plan of the workshop	25
42	Ceiling plan of the workshop	26
43	Storage rack detail	27
44	3D planning of the workshop	28
45	Entrance of the workshop	28
46	Display rack in the entrance	28
47	working stands	28
48	Working table for sheet/molding work	28
49	Sheet display board	28

50	Manual wheel working	29
51	Electric wheel working	29
52	Locker and dry material storage	29
53	Dow making table	29
54	Wash basin & wet clay tank	29
55	Storage rack and kiln area	29

LIST OF TABLES

Table No.	Title of Table	Page No.
------------------	-----------------------	-----------------

LIST OF ABBREVIATIONS

--	--

ABSTRACT

Since these ancient times, the technology and applications of ceramics has steadily increased. It plays very important role in daily life, from microcontroller to pottery making everywhere is ceramics. The ceramic has golden history since 42000 BC when it first found in Czechoslovakia and were in the form of animal and human figurines. The ceramic have hierarchy of products, recipe of the products and lot of research on it. But there is lack of research on the environment needed for the ceramics work. So the aim of the study is to design the workshop which is ergonomically feasible and have creative environment. This report covers the workshop related issues like Design of the workshop, function of the workshop, application of the material, management of the workshop, ventilation related issues, role of the ergonomics for enhancing the productivity, issue related life span of the workshop, safety related issue while using workshop, to form the interactive and creative work environment to make it purposeful workshop.

Keywords- Ergonomics, workshop, ceramics, ventilation, material.

CHAPTER 1: INTRODUCTION

1.1 Introduction

According to Chad Albrecht “*Workshops and seminars are basically financial speed dating for clueless people*” (Cohen, 2002). A workshop is a place or a room where ten to twenty-five people share a typical intrigue or issue. They get together to enhance their individual ability of a subject through concentrated examination, research, practice, and talk. (Maheshwari, 2012). The term workshop has been acquired from the building. In these workshops, people need to do some undertaking with their hand to deliver something. The workshop is where the point of higher learning is to build up the ability to regard the thoughts and sentiments of others; solid feedback, gratefulness, and present claim thoughts and look for elucidation. The student exhibits their own particular perspectives on the subject. Student’s possibilities must be created by utilizing the higher strategy of educating and guideline at the more elevated amount. A workshop is one of the primary procedures utilized for higher learning. (Maheshwari, 2012).

1.2 History

In the starting of Industrial Revolution period, a workshop might be a room, rooms or building which gives both the zone and instruments or hardware that might be required for the produce or repair of fabricated merchandise. Workshops were the main spots of creation until the approach of industrialization and the improvement of bigger production lines. In the 20th and 21st century,

numerous Western homes contain a workshop in the carport, cellar, or an outer shed. Home workshops ordinarily contain a workbench, hand instruments, control apparatuses and other equipment. Alongside their handy applications for repair merchandise or do little assembling runs, workshops are utilized to tinker and make models. (Joe, 2012)

1.3 Objective of the workshop.

1.3.1 Cognitive Objectives

The workshop is sorted out to accomplish the accompanying intellectual destinations (Maheshwari, 2012).

1. To take care of the issue in instructing calling.
2. To give the philosophical and sociological foundation for instructional and educating circumstance.
3. To recognize the instructive targets in the present setting.
4. To build up an understanding with respect to the utilization of a topic and issue.

1.3.2 Psychomotor Objectives

The accompanying goals are accomplished by this technique under psychomotor area (Maheshwari, 2012) .

1. To build up the capability for arranging and sorting out educating and instructional exercises.
2. To build up the abilities to play out an errand freely.
3. To decide and utilization of showing techniques viable

4. To prepare the people for utilizing distinctive methodologies of educating.

1.4 Function of workshop

The workshop investigates the components that impact the effective adjustment of instructing method to make particular learning courses of action. The "unique circumstance" made by the particular learning circumstance is viewed as the characterizing impact of showing strategy choice and adjustment.

1. The workshop strategy is utilized to look for, investigate and distinguish the answers for an issue; to allow the broad investigation of a circumstance, its experience and its social and philosophical ramifications.
2. It is utilized by educators for giving mindfulness and preparing for new practices and advancement in Education.
3. It gives a chance to get ready particular expert, professional or group, benefit capacities. A high level of individual interest is energized. It grants amass assurance of objective and strategy. (Zamek, 2009)

1.5 Ceramic workshop safety

1. The First Aid Kit is situated at the sink close to the stairs and mechanical room.
2. Tomfoolery of any sort is prohibited.
3. Close-toed shoes are required, no shoes in the earthenware production lab.
4. No eating nourishment in work territories.
5. In the event that you have sensitivities or are pregnant please advise your teacher.

Working in the

6. Earthen ware production lab could be risky to your wellbeing.
 7. All mishaps, including minor scratches or cuts, ought to be accounted for quickly to an AAC staff part.
 8. Gems, ties, and garments, which are regarded to be risky by Staff or Faculty, must not be worn while taking a shot at the potter's wheel, or some other gear. Long hair ought to be tied back while working machines with moving parts.
 9. No Smoking or savoring the earthenware production lab. Try not to go to the earthenware production lab or work hardware in the event that you are affected by liquor. This displays an extremely perilous circumstance. Infringement of this control brings about a quick expulsion from the Cody building furthermore, workshop without discounts of any sort.
 10. Tidy up of work regions ought to be finished with a wet wipe. No broom in the earthenware production lab as it raises dust that will stay airborne for quite a long time. Water is the best answer for cleaning. Know about floors that might be elusive.
 11. .DO NOT work apparatus to which you have not been prepared or doled out. .Dust covers must be worn when making earth or coatings.
 12. Elastic gloves ought to be worn when making coats that contain overwhelming metals.
- (Zamek, 2009)

1.6 Ergonomics in Design

According to John Harrison “*Where There Is Tension, There Are Accidents. Let’s Avoid both*” (Mister.d, 1999). Ergonomics is the exploration of a wide range of things in working conditions. It is the means by which people connect with their condition and how it is to be done legitimately. The Word "Ergonomics" originates from two Greek words "ergon", which means work, and

"nomos" signifying "normal laws". (Mister.d, 1999) The calling that applies hypothesis, standards, techniques and information to configuration keeping in mind the end goal to advance human prosperity and general framework execution. The ergonomics are additionally isolated into three sections as follows. (cohen, 2002)

1.6 Types of ergonomics

1. Physical ergonomics: Physical ergonomics is about the human body's reactions to physical and physiological work requests. Dreary strain wounds from redundancy, vibration, power, and stance are the most well-known sorts of issues, and in this manner have outline suggestions. (Martin, 2005)
2. Cognitive ergonomics: it is taught and practices that mean to guarantee suitable cooperation between work, item and condition, and human needs, abilities, and confinements.
3. Organization ergonomics: it manages the authoritative structures, approaches, and forms, similar to move works, work fulfillment and so forth.

1.7 Aim of ergonomics

The purpose of ergonomics is to ensure that the working circumstance is with in amicability with the exercises of the laborer. This time is self-obviously legitimate however obtaining it is a long way from simple for an assortment of reasons. The human administrator is adaptable and versatile and there is constant adapting, yet there are very substantial individual contrasts. A few contrasts, for example, physical size and quality, are self-evident, however others, for

example, social contrasts and contrasts in style and in the level of expertise, are less simple to recognize. (Wang, 2016)

1.8 The principal of ergonomics.

1. Ergonomics lessen costs.
2. Ergonomics enhances profitability.
3. Ergonomics makes a superior security culture.
4. Ergonomics enhances quality.
5. Prevent MSD musculoskeletal scatters.
6. Improved security
7. Diminished social insurance costs
8. Enhanced profitability and productivity
9. Lessened working and preparing costs
10. Expanded income
11. Enhanced item quality, work procedures, and nature of work life.

1.9 Working environment Safety

Essential security relates not exclusively to a client's freedom, achieve, strong quality and stance, yet additionally to work dangers related to materials, procedures, and hardware. (cohen, 2002)

Some preventive measures to wipe out occupation dangers and secure include:

1. Overhaul of gear (to anticipate unplanned operation).
2. Changes in a material, gear or process (utilization of without hands controls).

3. Change in a procedure to limit MSDs.
4. Techniques to confine client's exposures to dangers.
5. Utilization of defensive gear and attire.

Some wellbeing parts of working environment ergonomic plans can include:

6. Setting up of security systems and preparing programs.
7. Leading an occupation/undertaking or worksite examination.
8. Situating gear and work surfaces so dishonorable developments are disposed of.

(Martin, 2005).

CHAPTER 2. LITERATURE REVIEW

2.1 literature review

The literature review covers the various studies conducted in the past in the field of ergonomics in a ceramic design workshop. Subsequent paragraphs give an overview of the important literature relevant to this research.

(Sondahl Pottery Studio 2009) claims that the arranging ought to be finished by the procedure of the pottery. From the dirt on the wheel to definite preparing in oven, everything must be at the appropriate place. To upgrade the space the racks are expanded by 30 percent and coating material put under that. Preparing zone for the workshop is supplier at the better place from introductory advances.

(Greenwood pottery 2010) claims that the primary alteration was made subsequent to getting a utilized piece roller and obtained it. At that point in the wake of working in the studio for a while, each other option included another bit of gear (blender pug process). The latest change was made to position the pug process so it would enable me to reuse earth promptly subsequent to investing some energy tossing. Space did not take into account constructing a shut oven room but rather the divider was included in the furnace range and the coating table. I found that the ventilation framework truly keeps the vapor out of the studio. At that point, a few fans added to help circle

the air around the furnaces and I set the air taking care of framework to a temperature of 80 degrees which shields the warmth from working up. It has not really affected the electric bill up until this point.

(NID, 2011) guarantee that their workshop is isolated into two sections, one section is given to coating segment and another part is given to the stoneware making and oven segment. There are add up to six wheels three of them are utilized for the pop model for shape process and another three for mud tossing. As the coating need clean free region with the goal that range is unique.

(NBC, 2012) claims that this kind of building goes under the gathering B and subdivision B-2 which details that if the length of the room is more than 30' there should twofold section and if the tallness of the building is more than 45', there ought to be a crisis exit. The inhabitation of the ceramics workshop is as following

Entrance, Student rack, Display rack, Faculty table, working table, Pottery wheel, Material stockpiling territory, Kiln territory, washing area, Sheet show territory, and finish item retire.

2.2 Live case study

2.1.1 Potter workshop

Place- Chandigarh collage of arts

Jan Marg, Sector 10 C,

Near Government Museum and Art Gallery,

Chandigarh, 160019

Contact no. 0172 274 0309



Fig.1 Entrance of the college.



Fig. 2 raw material area.



Fig. 3 manual sculpting area



Fig. 4 open working area



Fig. 5 Dow making area



Fig. 6 Storage rack



Fig.7 Potter wheel



Fig .8 POP slab for clay drying.



Fig. 9 tub for clay mixing



Fig. 10 kiln for baking products



Fig. 11 light ventilation through the ceiling

Fig. 12 light ventilation north side

2.2.2 Pottery workshop

Place – APJ collage of fine arts

New Jawahar Nagar,

Mahavir Marg, Jalandhar,

Punjab 144003

Contact no. 0181 245 8547



Fig. 13 Entrance area



Fig.14 Sheet working area.



Fig.15 Display area



Fig 16 working area.

CHAPTER 3: OBJECTIVE OF THE STUDY

To provide a new proposal for the ceramic workshop that is being used in educational space which is not ergonomically proportionate and feasible according to work. Design a hard workshop that is ergonomically appropriate for the student to work that will improve the working capacity and efficiency of the workshop.

- 1 Significances of the study are to design the workshop with some particular aspect such as
- 2 Site orientation,
- 3 Maintain an interior-exterior relationship,
- 4 To provide the user-friendly environment,
- 5 Futuristic workshop.

The focus of this paper is to design a sustainable workshop by using all the aspects that are discussed above and try to apply the techniques and method of doing an appropriate research.

CHAPTER 4: METHODOLOGY & CONCLUSION

4.1 Methodology

The flow chart below gives the proposed methodology following in the research

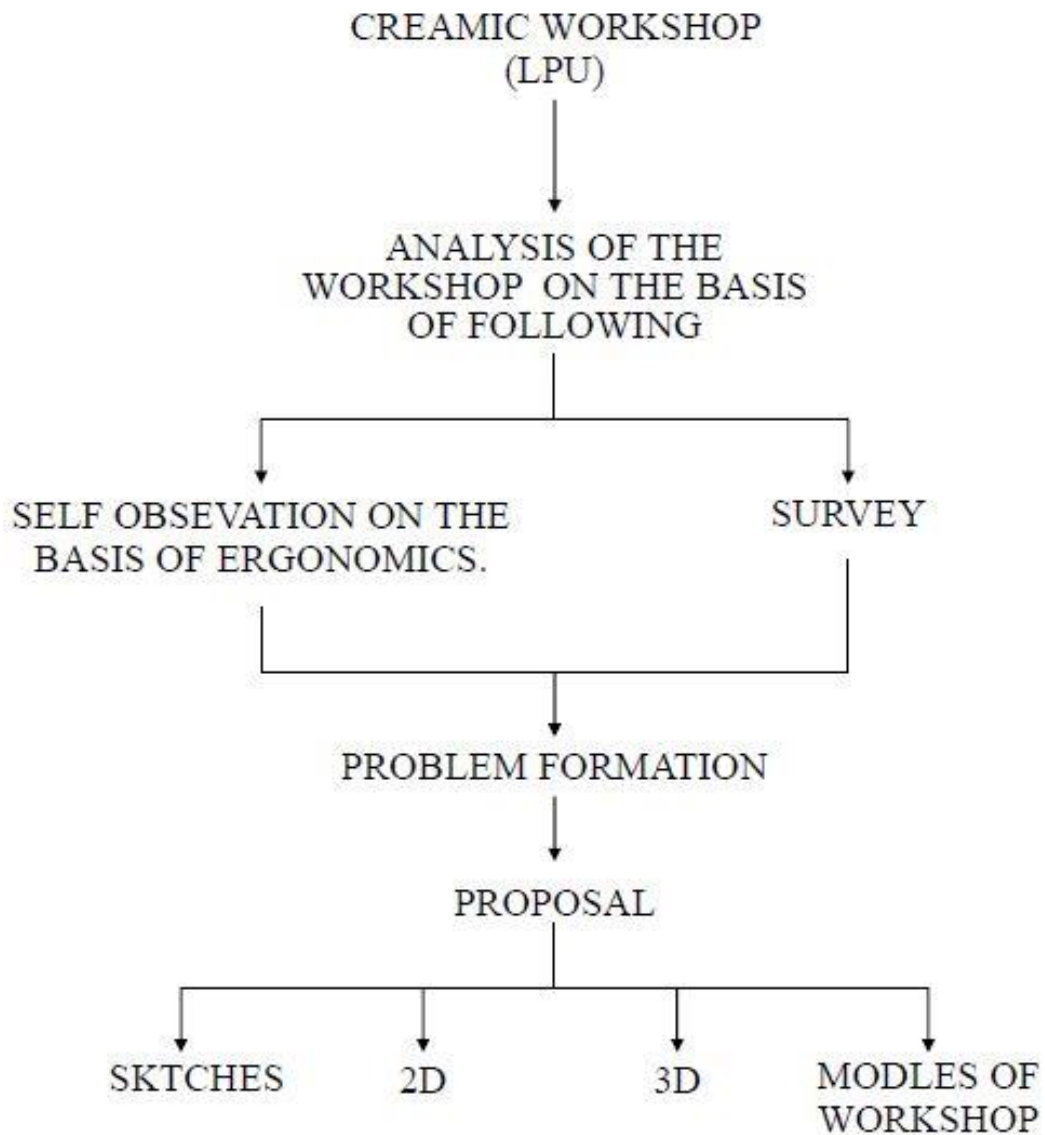


Fig. 17 flow chart of the methodology.

4.2 Ceramic workshop (LPU)

The ceramic workshop of the **lovely profession university** is located in 8th block, in the basement room no. 104.



Fig. 18 The entrance of the workshop of 8C-104.



Fig.19 working area of the workshop



Fig. 21 working area



Fig. 20 working table of workshop



Fig. 22 exposed ceiling of the workshop



Fig. 23 storage racks.



Fig. 24 storage racks.



Fig. 25 storage area



Fig. 26 storage rack with locker



Fig. 27 basin area



Fig. 28 clay tank



Fig. 29 storage area

4.3 Analysis of the workshop on the basis of ergonomics.

The analysis of the ceramic workshop 8C-104 of the LPU is done on the basis of self-observation and survey.

4.3.1 Self-observation

1. The planning of the workshop is not according to the utility.
2. The furniture of the workshop is not ergonomically designed.
3. The material of the furniture is not suitable for the ceramic workshop.
4. There is no specific space/table for the supervisor.
5. There is no specific space for the storage of material.
6. There is no proper display rack.
7. The whole workshop is messy.
8. There is no space for baking kiln.
9. The basin cannot use for mold washing.
10. As the workshop is in the basement, water gets collected in the workshop. For that the dry material needs raised rack.
11. The lighting in the current workshop is very less.
12. Air circulation is not proper.
13. Locker for the tools is not provided.
14. There is no proper space for Dow making.
15. The circulation area is not proper.
16. There is no such area for the beginner.
17. There is no sheet display area.

4.3.2 Survey

The survey is conducted of the ceramic workshop 8C-104 from fifty people who regularly use the workshop and results are following:

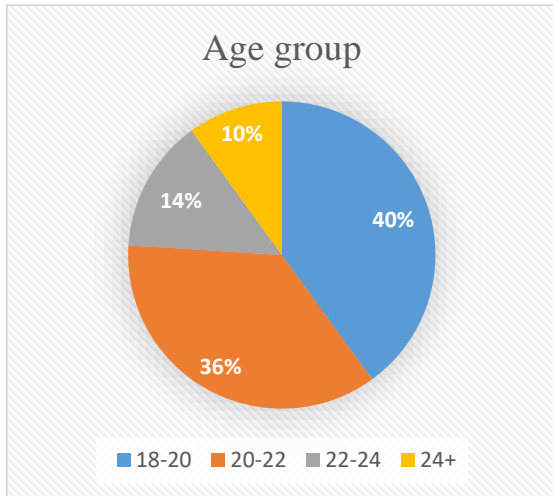


Fig. 30 chart shows the age group of People using workshop.

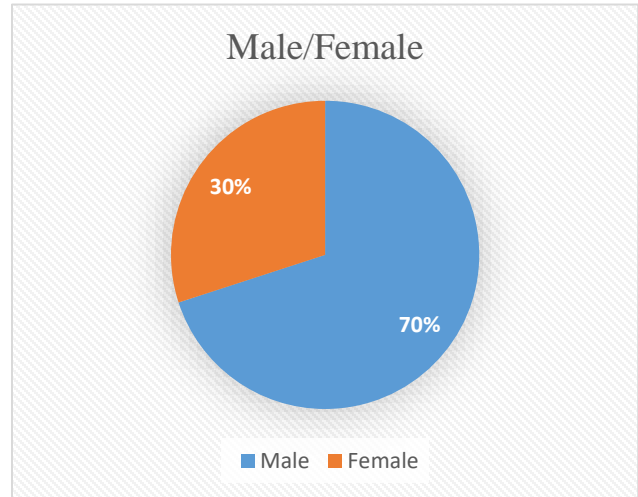


Fig. 31 chart shows the sex ratio using Workshop.

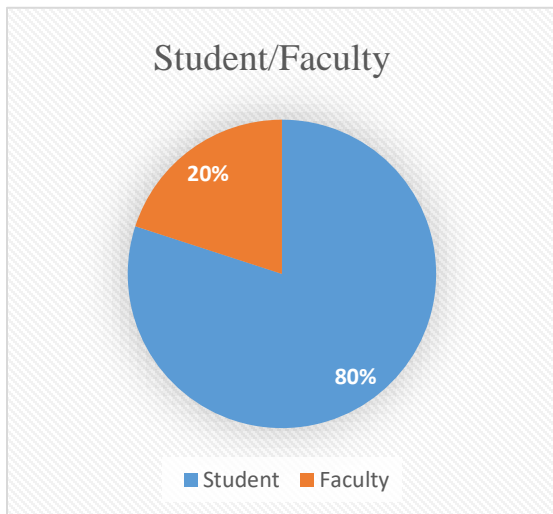


Fig. 32 chart shows the ratio of student/ Faculty using workshop.



Fig. 33 chart shows the visiting in the Workshop.

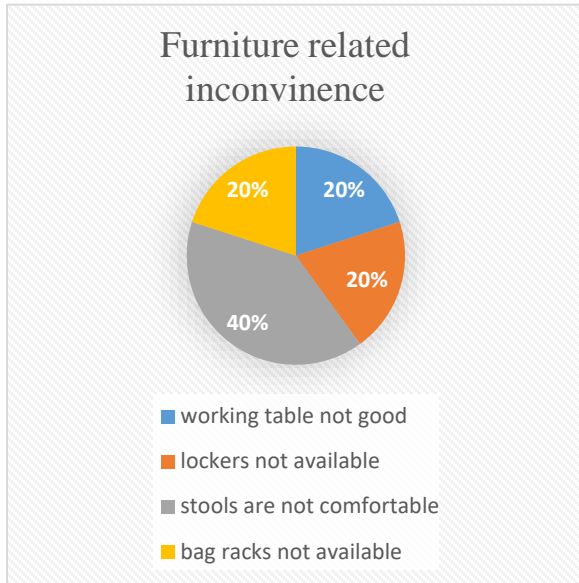


Fig. 34 chart shows the furniture related Inconvenience.

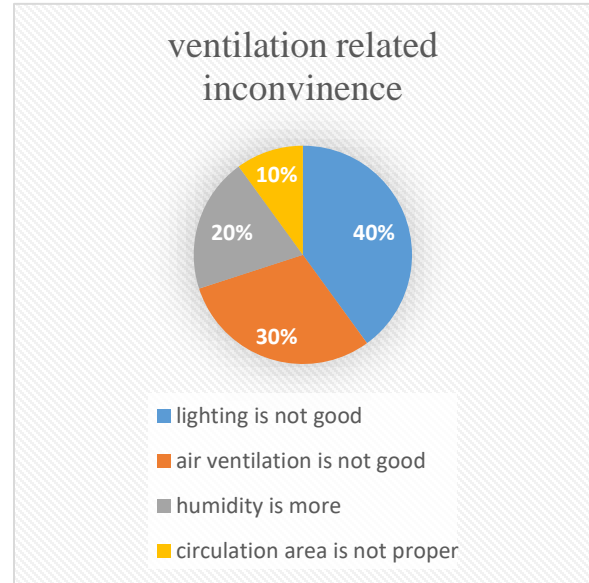


Fig. 35 chart shows the ventilation related Inconvenience.

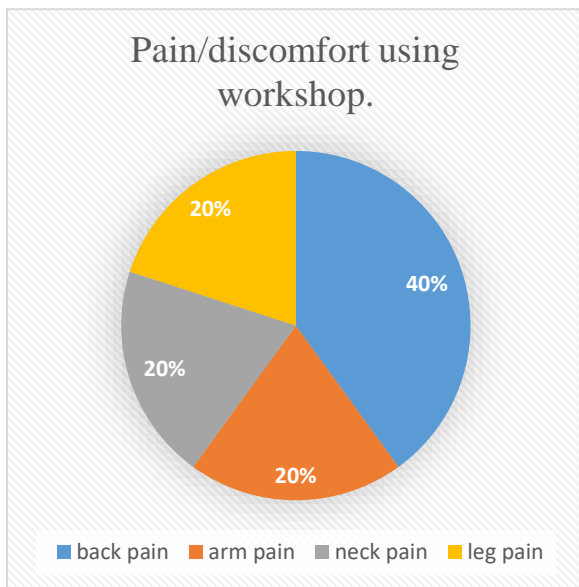


Fig. 36 chart shows the pain/discomfort Using workshop.



Fig. 37 chart shows the cleanliness related Inconvenience.

4.4 Problem formulation

As the data gathered from the self-observation and survey, the problem formulation as follows.

- 1 The workshop needs proper circulation area.
- 2 The workshop needs proper lighting for work.
- 3 The workshop needs a separate area for faculty.
- 4 The workshop needs ergonomically design furniture.
- 5 The workshop needs separate storage area.

4.5 Design proposal

4.5.1 Sketches

The design process involves sketches for concept evolution for the better result.

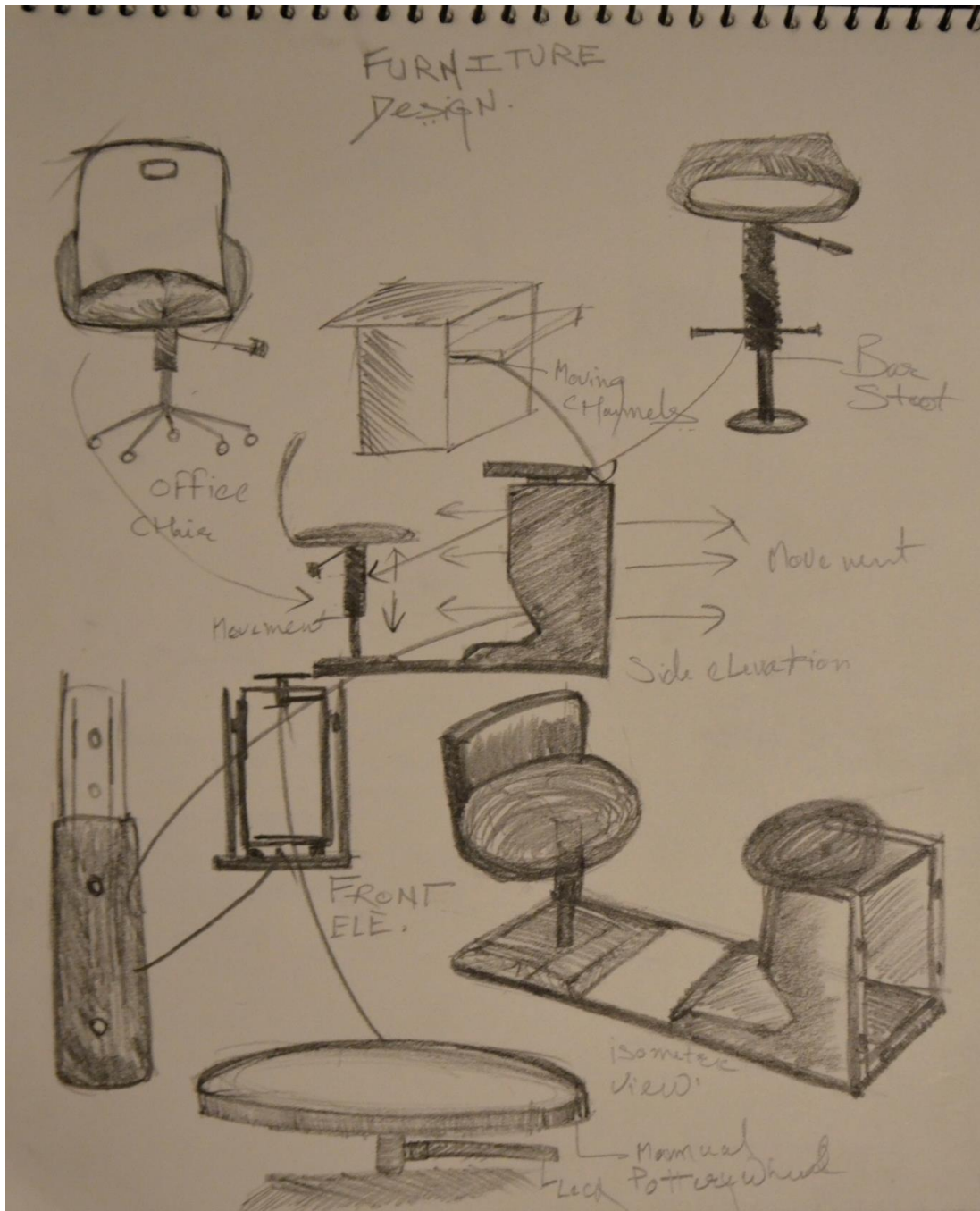


Fig. 38 concept of the furniture for manual wheel working.

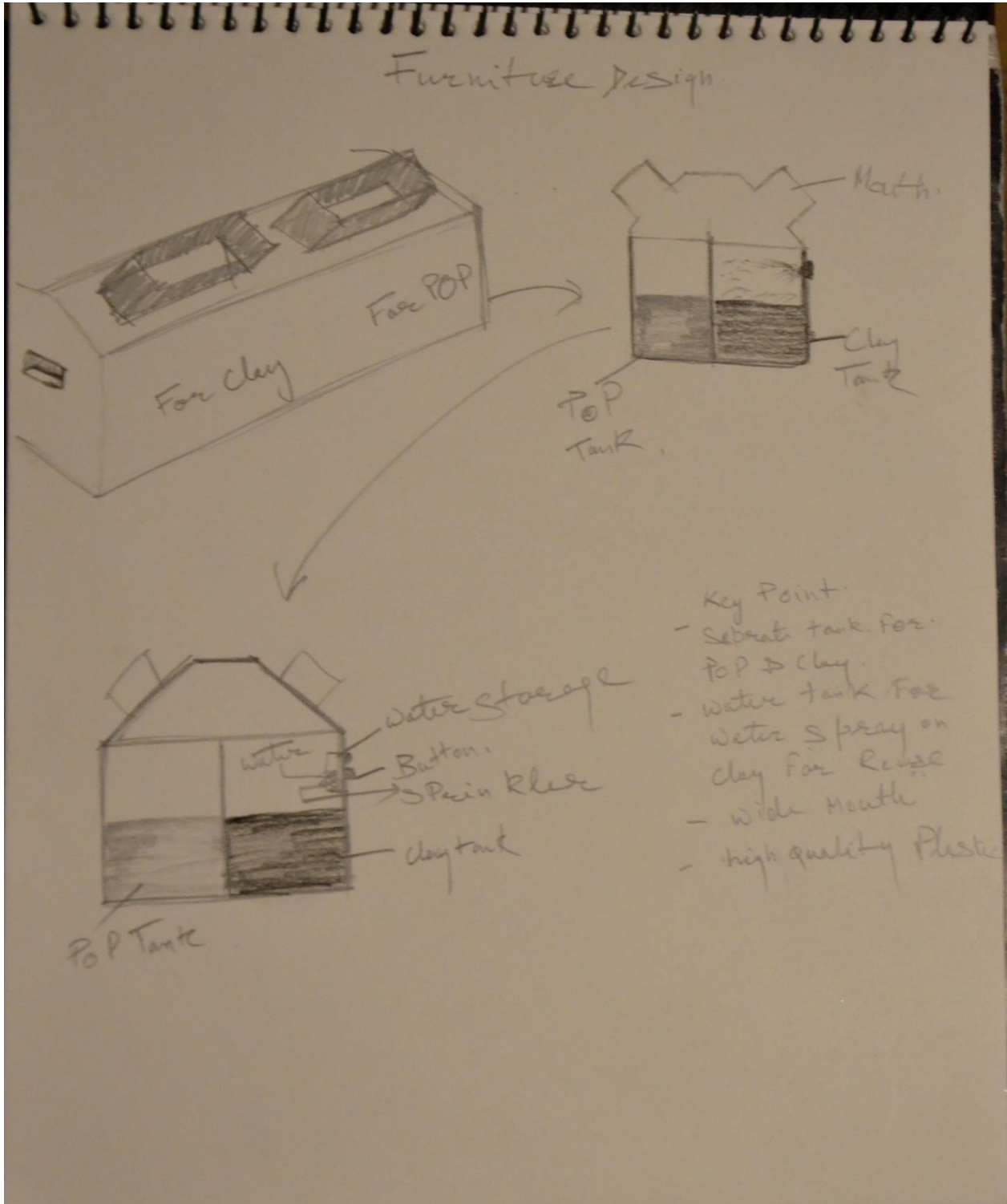


Fig. 39 concept of the trash box for waste management of clay and POP.

4.5.2 2D Drawings

2D drawings shows the proper placement of the furniture and the planning of the space for better working environment.

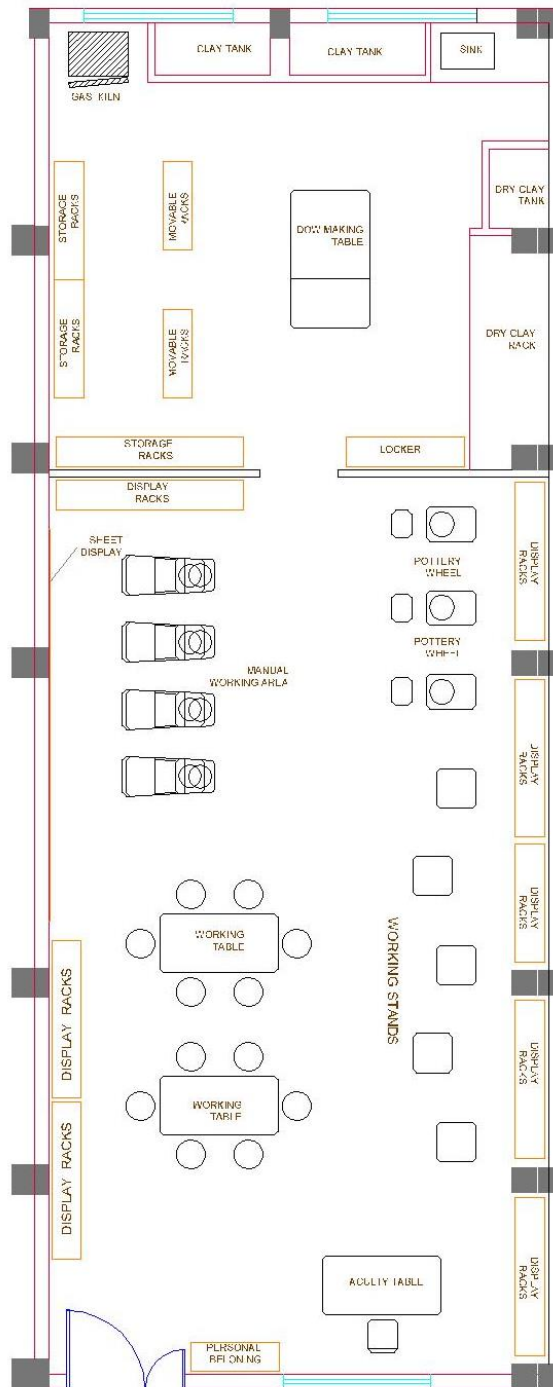


Fig.40 it shows the working layout of the workshop and placement of the furniture and circulation area.

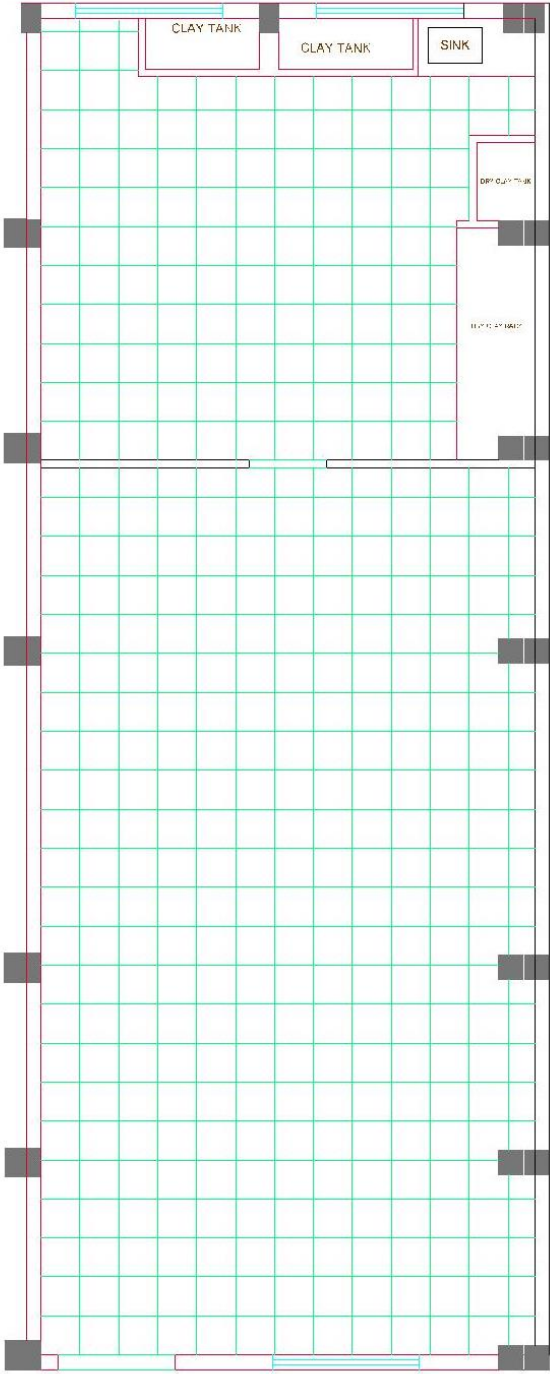


Fig. 41 flooring layout of the ceramic workshop for laying the marble, as the workshop is equipped with heavy furniture and tools. The size of the marble is 2'-0" x 2'-0". The total number of marble required is 560 including wastage of 5 percent.

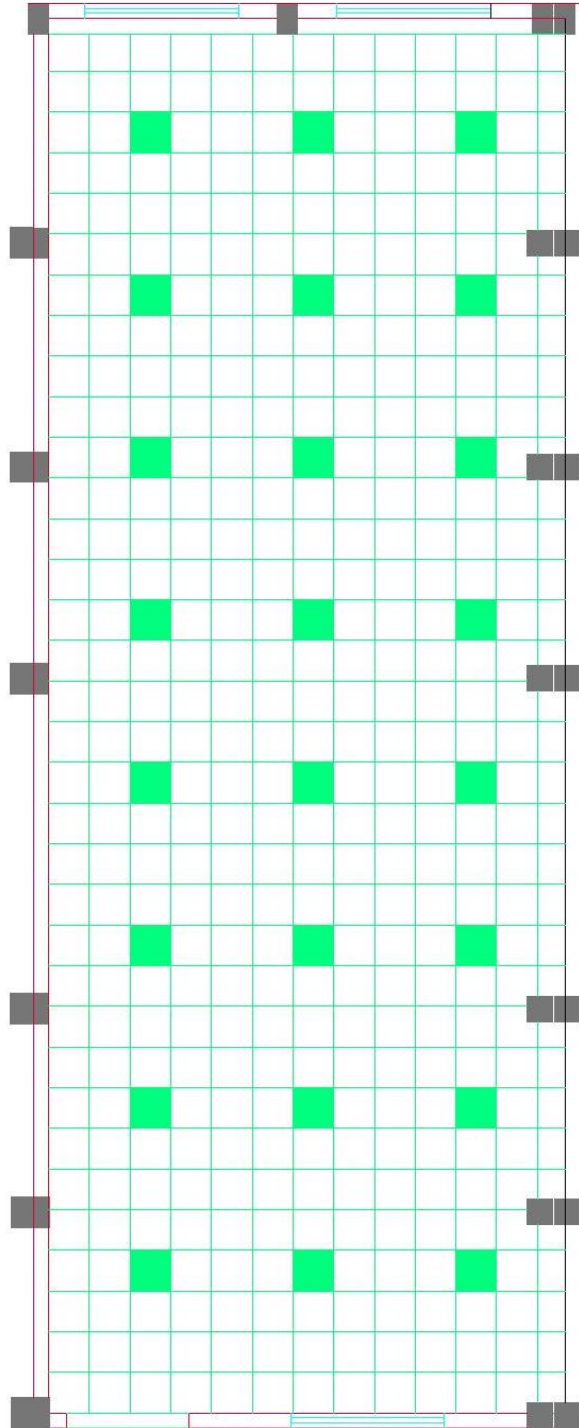


Fig. 42 ceiling plan of the ceramic workshop with down ceiling of 1'-6" from the actual ceiling, gypsum board of size 2'-0" x 2'-0" in grid form is used with L.E.D. panels of size 2'-0" x 2'-0". The total number of L.E.D. panel required are 24.

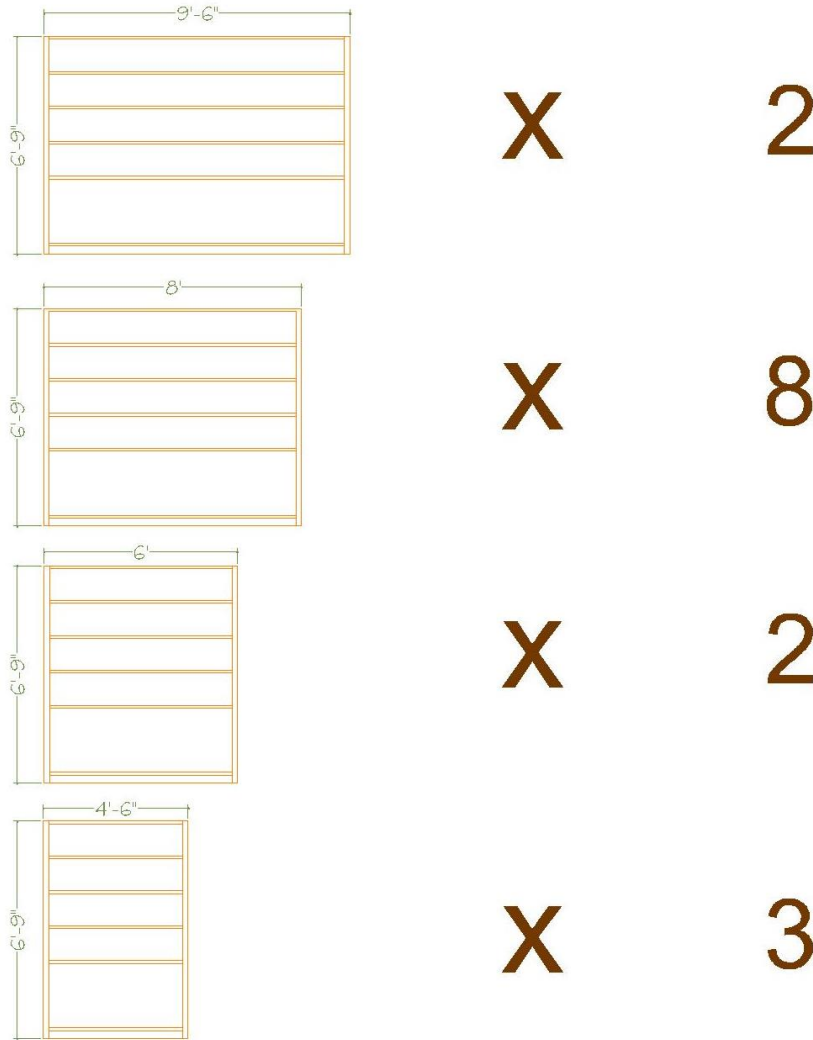


Fig. 43 Different size of rack required for the display and storage purpose. The spacing between the racks area 2'-0" and 1'-0".

4.5.3 3D views

For the fine estimation 3D views are necessary. Visual impact of the 3D views is much more than the 2D drawings and as it is said we learn or understand things more when we see them.

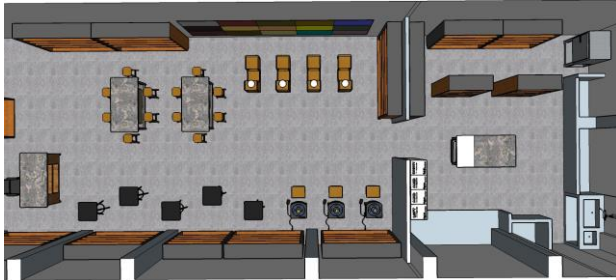


Fig. 44 the planning of the workshop including Working area, circulation area, storage area, And baking area.



Fig. 45 Entrance of the workshop including personal belonging rack, faculty table with Marble top.



Fig.46 display rack in the entrance for the unique Products to enhance the environment. The lower Shelf is 2'- 0" gaped for XL size product.



Fig. 47 working stands for clay molding with with adjustable height and rotatable.

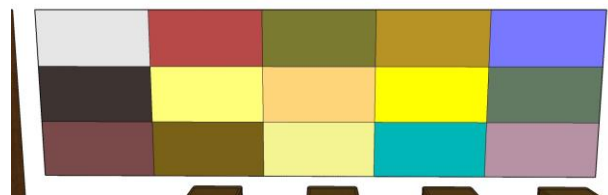


Fig. 48 working table with marble top for sheet Work and clay molding, trash box under the Table for used clay and P.O.P.



Fig. 49 Sheet display area with colorful panel to maintain the creative environment of the Workshop.



Fig. 50 manual work wheel for the bingers With adjustable height and horizontally Movable working table.

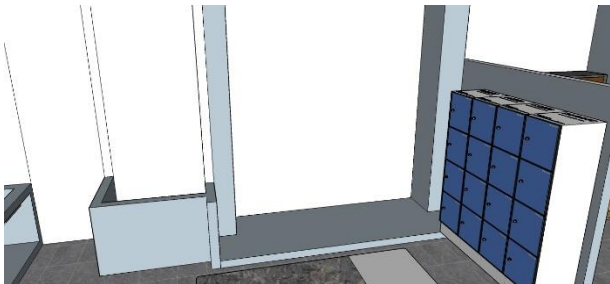


Fig. 51 Pottery wheels for the pot making.



Fig. 52 locker and dry material storage for tools, Ceramic clay and pop storage. 6" razed platform Is given for clay and pop storage.

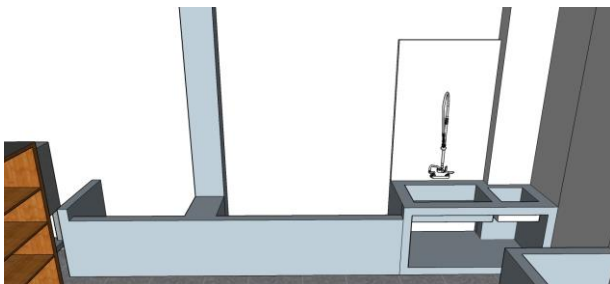


Fig. 53 Dow making table for making proper Sharing of 60% and 40% respectively.



Fig. 54 wash basin and wet clay tank for mould Wash and two different tank for ceramic clay and terracotta clay. Fig. 55 storage rack for baking and baked product. And two movable rack for product Moving.

4.6 Conclusion

This report presents the importance of the ergonomics in workshop and summarily described about the workshop. As the batter work need batter environment and good working conditions, so workshop also need to be updated and fully equipped with manual and automatic tools. The ergonomically designed workshop is also important for research and development purposes. The designed workshop provide space for 25-30 plus 1 faculty. The planning of the workshop is actually space management which increases work quality as well as life span of the workshop. For the waste management and reusability of the material new trash boxes were introduced which also lead to meet the sustainable goals. The wide area is provided in the workshop for the display of the products and sheet work for increasing creative level and motivation. The whole idea results extremely purposeful and powerful creative workshop.

REFERENCES

- 1 Wachtman, John B., Jr. (ed.) (1999) Ceramic Innovations in the 20th century, The American Ceramic Society.
- 2 Black, J. T.; Kohser, R. A. (2012). DeGarmo's materials and processes in manufacturing. Wiley. p. 226.
- 3 Cooper, Emmanuel (2010). Ten Thousand Years of Pottery. University of Pennsylvania Press.
- 4 www.newton.k12.in.us/art/3d/images/introtoceramics.pdf
- 5 <http://sondahl.com/shop1.html>
- 6 Dr. vk mehashwari (2012) workshop-an instructional method, Former Principal K.L.D.A.V(P.G) College, Roorkee, India.