

DESIGN AS A PERFORMING ART

**PRODUCT DESIGN
SPECIAL PROJECT**

**Neha Bharshankar
05613009**

Guide Prof -**U.Athavankar**

Submitted in the partial fulfillment of the requirements
of the degree of
Master of design
In
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Indian Institute Of Technology Bombay**

With sense of achievement and satisfaction, as I reflect upon my project activity, filled with a deep sense of gratitude toward the important few whose help and support were instrumental in the completion of my project.

I wish to express my great fulness to my guide Prof. U.Athvankar who encouraged and inspired me in undertaking this project. I thank him for his guidance throughout the project.

I am thankful to the architects Archana ,Mahyar Vaid and Sampada who actively participated in the study exercise . Also I am thankful to my parents for their support during the project study.

Apporval Sheet

The Product Design special project titled
"Design As Performing art" by Neha Bharshankar 05613009 is
apporved as a partial fulfillment of the requirements for post
Graduste Degree in Industrial design.

Project Guide :- _____

Date :- _____

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1 Abstract

This paper explores the way designer's use body movements to support the mental imagery while solving design problems. Giving a task of designing a handout place for students in the campus, this paper will identify and compare the unique strategies that the architects developed the design using his body as crutch to take visuo-spatial decisions when blindfolded and prevent from using their usual thinking tool like sketching. This experiment is an attempt to reveal the invention of design issues and requirement, using body movements has its relevance to mental imagery.

2 Introduction

The role of visualization and mental imaging during the early phase in the design problem solving had already been established in pervious papers.

It shows the significance of hand gestures .where in hand gestures seem to have contributed to the development of virtual models and in architectural design have contributed to hand to stimulate the object and to represent the object. This experiment is carried out to understand the significance of the **body movement during problem solving in architectural design.**

The subjects (the architects chosen for the experiment) has no difficulty completing the design task in spite of the eye-mask. However ,the new findings that the current experiment highlighted , are far more interesting.

A critical look at the protocol as well as the post experiment comments suggest that subjects have significantly used body movements during problem solving in design.

3 Literature review :-

Athavankar (Athvankar 1997)explores the role of visualization and imagery during the creative phase of design.

Design problem:- An industrial designer was given a casserole when blindfolded.

Results :- The experiment revealed that the designer created a virtual model in his mind's eye ,manipulated and altered it with his hand gestures.

The possibility to sketching denied the subject has used hand gestures. The subject used gestures to shape the product as if it were a soft clay block. He occasionally used them as memory clues to remember position and stimulate movement with the product body.

The hand gestures were used to: -

- Shape the product
- Represent the product in a virtual space
- Stimulate the product features and design credentials

U.A.Athavankar and Anshuman Singh dealt with analysis of the protocols of architects with the task of designing a problem given to him to design a model of a highway.

Architect used mental imagery for creating a virtual design studio in their minds. They were surprisingly accurate in the detailing of elements in their design, as well as in dimensions . The created virtual walkthroughs which were full of rich experiences of the ambience ,and even switched viewport to take various decisions.

4 Selection of subjects

The subjects chosen for the experiment were the students from architecture background and those who have had work experience of 2yrs to 5yrs. They were asked to conceptualize the design solution to the design problem (The design problem given during the experiment). The experiment was conducted using the sequence mentioned in the experiment procedure.

5 The structure of the experiment procedure :-

Two selected subjects with two to three years of experience were taken for **pilot study**. They were asked to design a bungalow for an affluent businessman. They were blindfolded and asked to describe the design verbally mentioning the front elevation ,the sitting layout ,the structural details, landscaping etc during the entire process of mental designing.

The design time in the experiment was limited up to 30min so that we could conduct the same experiment on more no of subjects and compared the design process as well as draw conclusions from the analysis of the experiment.

The solution required detailed design layout, structural detail, elevation, landscape ,sitting layout etc

A typical layout sequence of the experiment.

Stage 1

- ✎ A site drawing is shown to the subject.
- ✎ The subject is given time to understand the printed site plan and memorize the same site plan. Because the subject were blindfolded it was necessary that they should know the site geometry and features before they started the creative task(solve design problem).
- ✎ The subject was asked to recall the site plan verbally
- ✎ The subject was asked to create mental image of the site from the drawings.
- ✎ Missing details were added by looking at the drawing

Stage 2

The subject was given to -

- ✎ To understand the design brief
- ✎ To recall design brief from his or her memory
- ✎ Missing details were prompted to the subject

Stage 3

- ✎ Subject is blind folded by making him to wear eye mask
 - ✎ Subject was then asked to move in the controlled space provided imagining himself in the plot and to explain verbally the design as he developed design ideas.
- Some questions were asked during the problem solving to understand the subjects in the controlled space like -
- Where are you standing ?
 - What is on to your right, left ,front and rear
- Similar questions were asked as regards furniture layout details , roof details and any other elements as visualized in that space etc.

Stage 4

- ✎ Final design proposal out of the body movement articulation.

Stage 5

- ✎ Sum up of the final design in which the mask was removed and he was asked to sketch the final design proposal. (this was carried out to refer the design during the body movement).

6 Pilot study

The pilot study was conducted on the subjects from experiment. The pilot experiment was conducted in the sequence mentioned above.

Pilot study

Design Problem for pilot study -

Bungalow for an Affluent Businessman

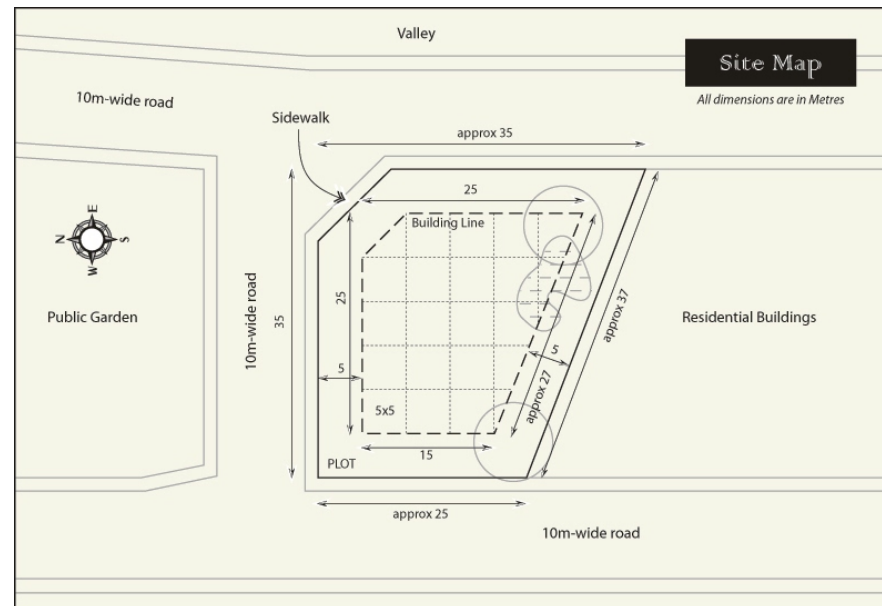
Client profile:

The businessman is in his early 40's

He has been exposed to the western world

Requirements:-

Room Type	M ²	Ft ²	Rough Sizes for Visualizations		
1. Entrance foyer	10	100	3m	x	3m
2. Large formal living and dining room	75	750	6m	x	12m
3. Kitchen + Store + Pantry	30	300	5m	x	5m
4. Master bedroom with toilet	35	350	5m	x	7m
5. Attached study	10	100	3m	x	3m
6. Children's bedroom with toilet	35	350	5m	x	7m
7. Guest bedroom with toilet,					
plus, adequate verandas/terrace	35	350	5m	x	7m
8. Car garage	18	180	3.5m	x	5m
Total	248	2480			



6.1 Analysis of pilot experiment:-

✎ Observations from pilot experiment

- ✎ The subject had no difficulty to express the design blindfolded during the experiment .
- ✎ The control space provided during the pilot experiment was less as compared to the design problem given to the subject hence the controlled space was changed as chosen according to the rough area requirement of the design problem.
- ✎ Certain viewpoints were used for creating scenarios (The subjects stands in one activity area and from there visualized the rest of the areas of the design) .
- ✎ The subjects used footsteps for marking grids on the control space.
- ✎ The subjects also reorient the direction of the north mentioned in the design problem.

The pilot testing enables us in refining the design problem as well as refining the technique to be used for analysis. The complexity of problem was reduced to the entire process of the experiment became clearer and went through a process of structuring the data generated from the experiment.

6.2 Analysis of subjects:-

References taken for body orientation and hand gestures: -
During the pilot experiment certain words seemed to have great significance in how the subject oriented himself in the given confined space.

Case 1)Architect 1

- The subject had created walkthroughs and various areas. His body move with reference to the left and right directions given by his hands. Hence the direction of north changes according to the orientations of his body.
- The walkthrough created by his imagination has given more ideas about the space around him .
- The spaces are visualized in details for example the body and hand gestures are used together to stimulate the staircase.
- The visualization of the space is as if the structure is under construction.

Case 2)Architect 2

- The subject enters the main center area and according to the her design the center lobby is the prime focus of the planning. The drawing, a kitchen, bedrooms are visualized from the central lobby. The subject was imaging himself at the central lobby and was orienting the rooms according to the north direction set by her imagination.
- Therefore, the position of north is seemed to be fixed.
- The subject is more static in her position.
- The certain references are made according to the past experiences like details of the staircase is like a glass staircase similar to the restaurant visited in "Juhu."
- The visualization of the space is as if the structure is completed and it is painted white.

Analysis of pilot experiment:-

The subjects explores the spaces in two different ways:-

1) Exploration of space around:-

The architect is exploring the space with respect to the body
Body rotation - left, right, front and the rear indicating activities.
North direction of the building is according to the body orientation
Vertical exploration of built form through hand gestures and body movement.

2)Exploration of location and space:-

The architect is experiencing the space through mental walk and physical walk or he is creating mental walkthroughs.

7.1 Protocol Analysis:-

This experiment is based on the analysis of protocol and their comparison. The analysis obtained from the pilot experiment were taken for the protocol analysis conducted on three architects which was studied, where all are young architects practicing in Mumbai.

The experiment data is recorded and captured from the point of the subject is blindfolded and starts designing. The protocol including all the decisions that the architects took while developing the ideas and also summing up their final design before the eye mask is removed.

The video record of their hand gestures, body movement and verbal description are done to ensure that we did not miss any details during experiment on the architects.

The entire process displays the non linearity and iterative character of thinking. The development of idea was traced along the time line to study the thought process and identify their sources which influenced design decision.

The design time in the experiment was limited unto 30min so that we could conduct the same experiment on more no. Of architects and compared the design process as well as draw conclusions from the analysis of the experiment

The solutions required detailed design layout detail, elevation, joinery details, sitting layouts and summing up the design

7.2 Design problem for the protocol analysis

Requirements:

Room Type	M ²	Rough Sizes for
Visualizations		
1. Entrance 3m	9	3m x
2. Sitting area - semi open, open and close place. 12m	200	15m x
3. Counter area 5m	25	5m x
4. Display area 7m	35	5m x
5. Kitchen + Store + Pantry 7m	35	5m x
6.		
Parking		
Total	304	

The architects were asked to “Design Hang out for IIT students”..

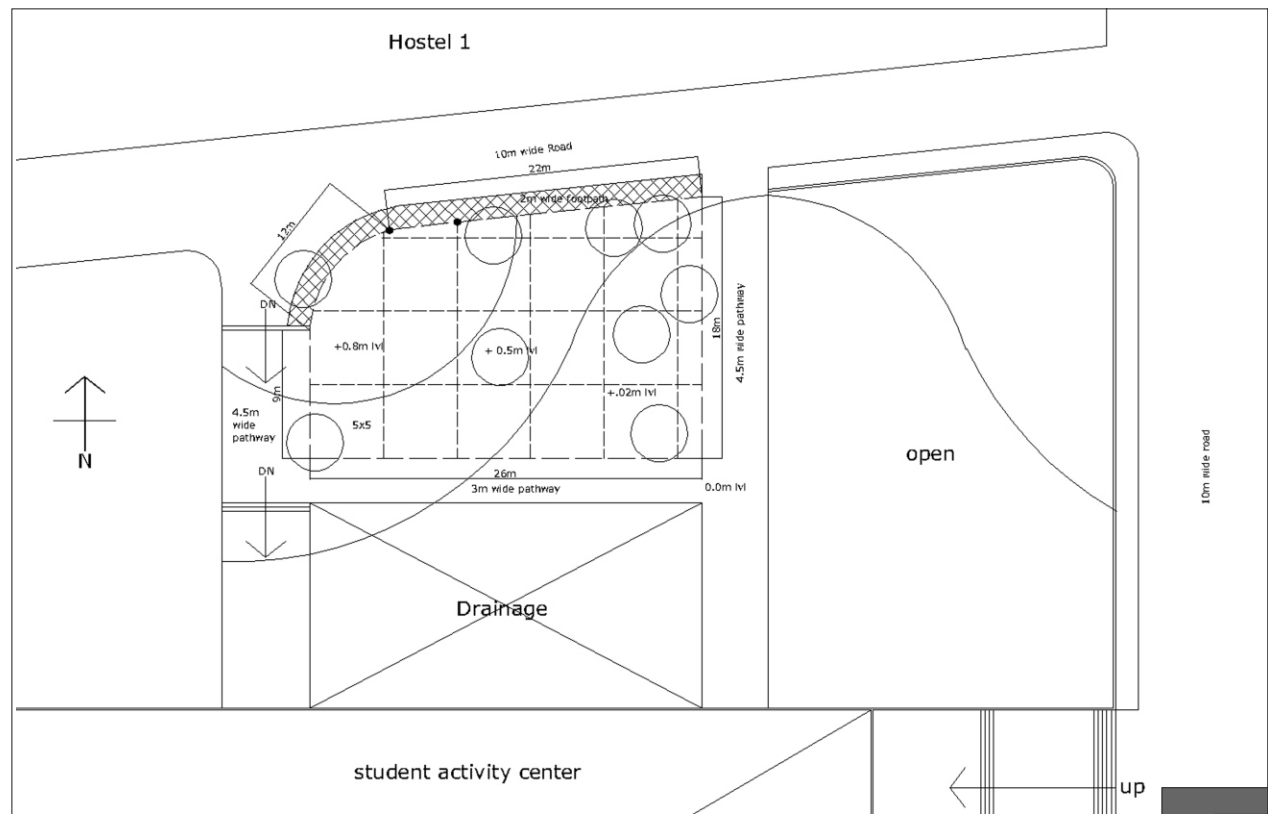
✎ Students attend classes in the morning and afternoon they have lunch break from 12:00pm to 2:00pm

✎ In the afternoon session classes are not regular .

✎ In the evening sac is used by students for performing various activities like singing, dancing, playing T.T. table, caroms, swimming etc. it is always live in the evening .

✎ Mostly after 10:00pm they study, check mails, chat and discuss among friends.

Sometime they study late night during exams and submissions



7.3 The subject for the protocol analysis.

The following architects were used as subject: -

- 1)Mahyar Vaid (MH):-2 to 3yrs of experience in architecture.
- 2)Archana (AR):-3yrs of experience in architecture and interior design.
- 3)Sampada (SP):-3yrs of experience in architecture and interior design.

The subjects were interviewed with questions with influence on solutions given by the subjects in the controlled space like -

- Locations (where are you standing)
- Body orientation(What is on to your right, left ,front and rear
- Similar questions were asked as regards furniture layout details , roof details and any other elements as visualized in that space etc.

The critical analysis was conducted the way the subjects explore the space

On pervious pilot experiment the subjects explore the space in following ways:-

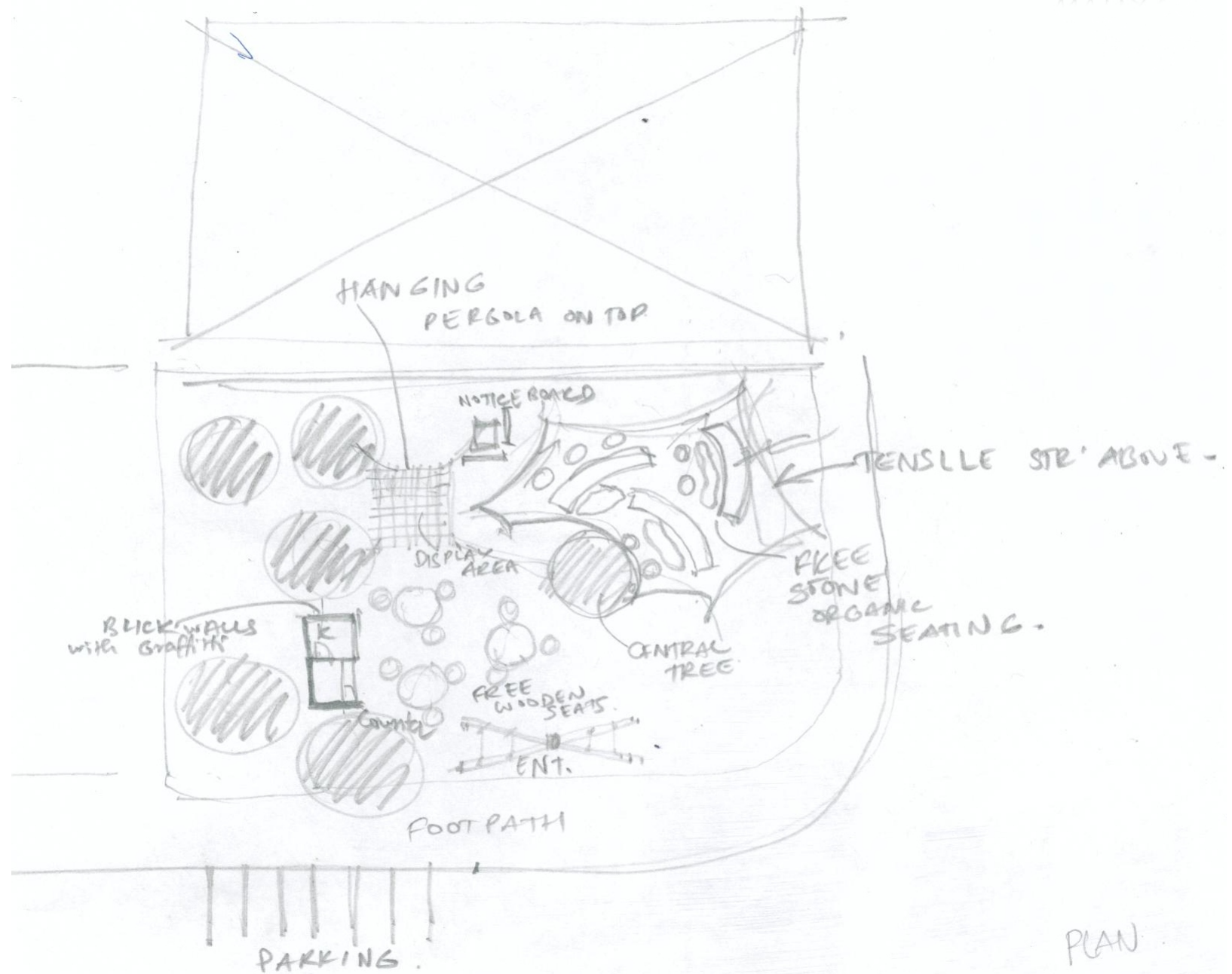
- 1) Exploration of space around the body**
- 2)Exploration of location and space through body movements.**

7.4 Total time for the experiment

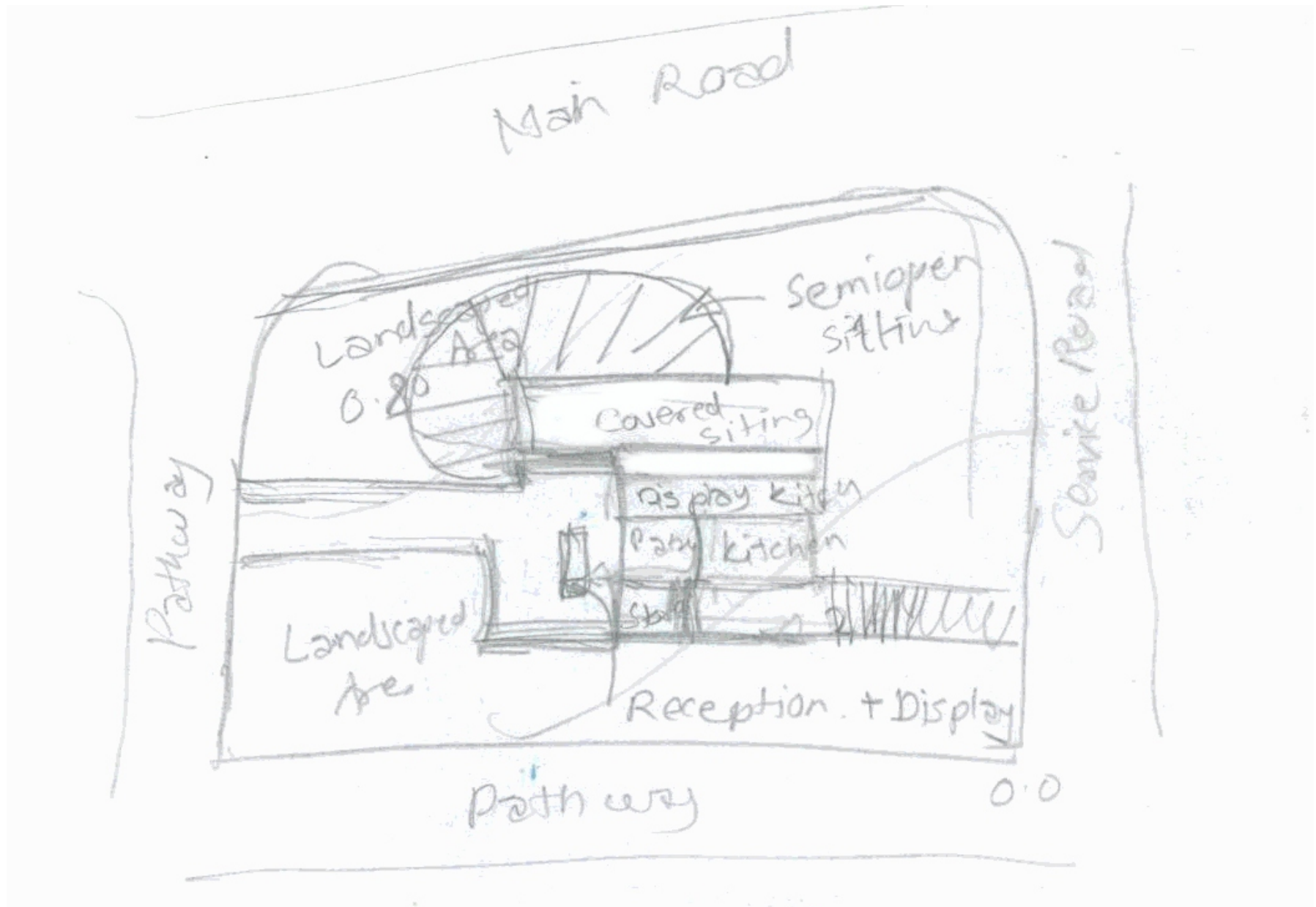
Stage	Activity	Time stamp		
		MH	AR	SP
Stage 1	familiarizing with the drawings of the existing building (see figure 1) by studying them and drawing and redrawing them, until he was able to reproduce it quite accurately and describe it fully after being blindfolded	00:00-06:15	00:00-10:08	00:00-15:12
Stage 2	Reading the design brief and recapitulating it, until all requirements were recalled correctly.	06:15-10:10	10:08-13:20	11:12-13:05
Wear the mask and start designing				
Stage 3	Blindfolded problem solving	00:27-10:00	00:36-16:35	00:00-07:58
Stage 4	Final design proposal articulation	00:04-11:45	16:50-20:16	08:12-10:44
Remove the Eye Mask				
Stage 5	Quick sketching of design	11:45-18:75	20:16-22:50	10:44-15:02
Total time taken for the experiment				
		29:10	36:08	28:07

8 Results

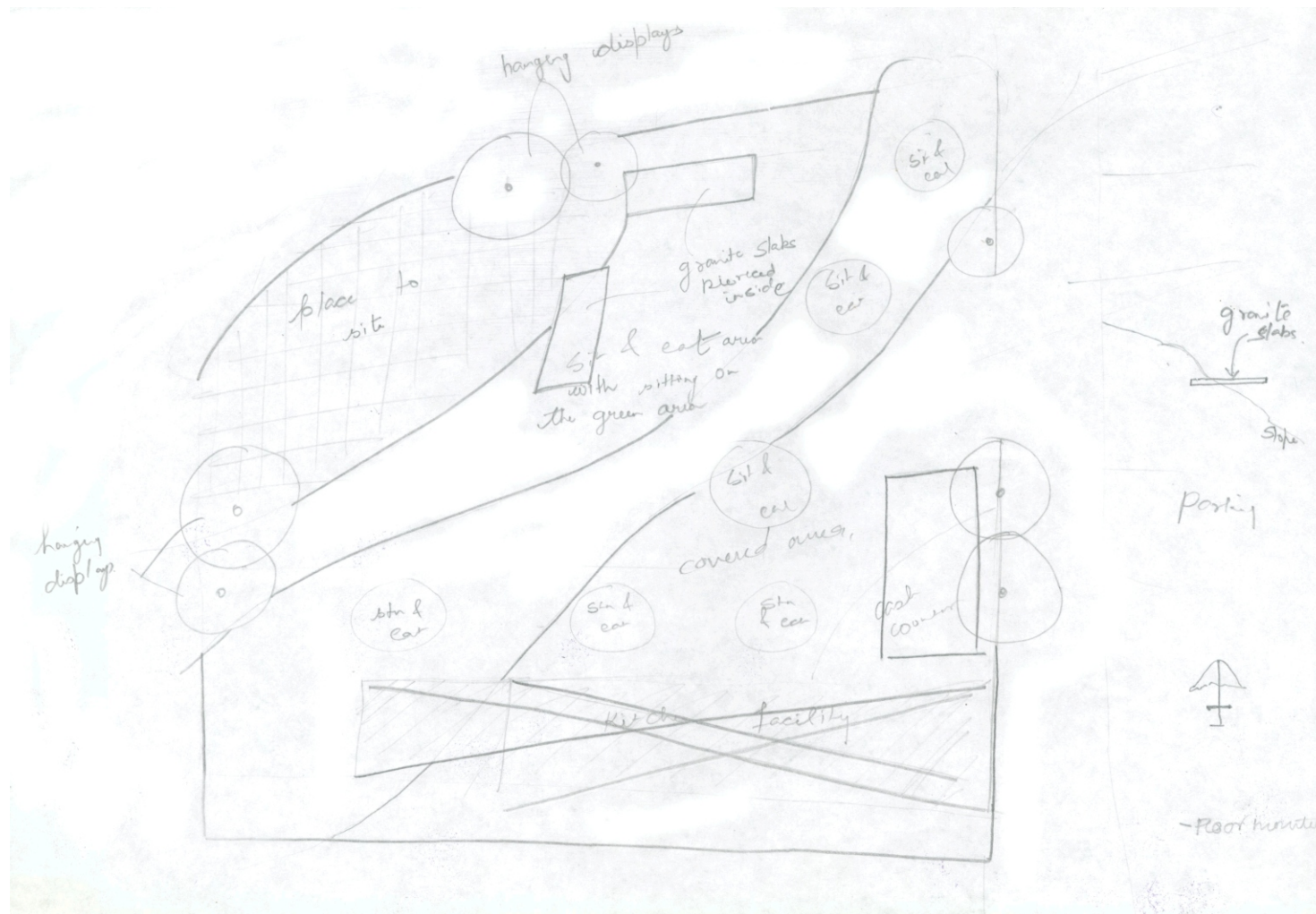
8.1 The final drawing of the MH



8.2 The final drawing of the AR



8.3 The final drawing of the SP



9 Post session interviews:-

MH

AR

SP

What is the difference between the regular design method and the above experiment ?

- In a regular method plan helps in creating images
- During the experiment the image of a plan was in the mind.
- Comfortable with the experiment.
- He imagines himself as a first person and could visualize clear images.

- There are not much of the differences between the two methods of solving design problems.
- Comfortable with the experiment on her.
- She felt as if she has entered a complete constructed building

- In regular method of designing the scale factor plays important role which is already seems on the drawing sheet itself.
- During the experiment scale has to imagine
- She has imagined the space instead of the structure

10.1 Analysis and comparison among the three subjects: -

MH

AR

SP

Exploration of space through Body movement

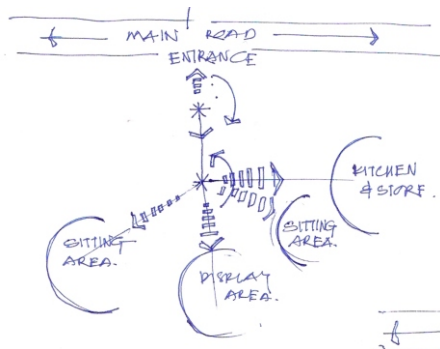
Central idea:-

MH (00:27 to 74:02)

I am standing in the center of the plot probably very close to the tree and facing northnorth is in this direction .

I see in front of the site near entry you have a curve probably a bamboo for the entrance small space ...a greenery around it. Element of some stone culture which creates the interest on the entrance.

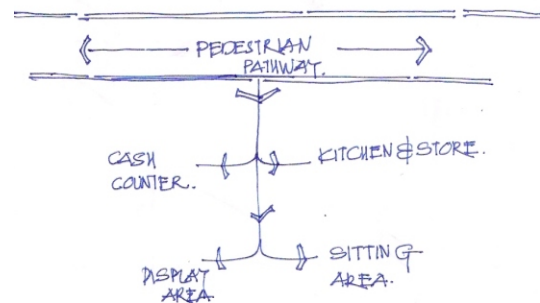
The body movements are very less because he has already considered himself inside the plot. Hence he explore the space around his body.



AR (00:24 to 05:21)

There is road in between and the open space behind and your site here i am entering from the road. which at 200mm level and site slopes like that. i am entering from here. On my left side kitchen and store since the drainage is all that is here. As i am providing here ...all my kitchen facilities here the site ..left side. On the right side as in the corner at the entrance . I have my counter area.

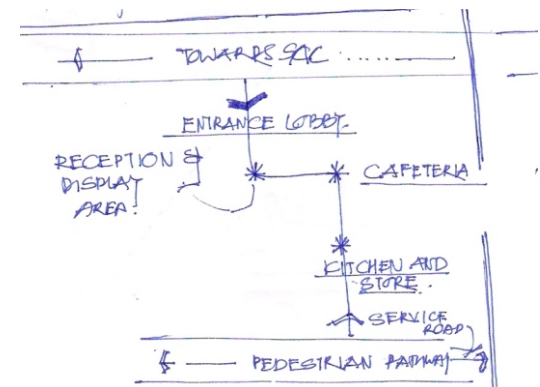
Body movements are more as she enter the plot, moves and explore spaces in various direction like on right hand side, here, left hand side etc. Hence she explores the spaces in different direction.



SP (00:00 to 01:13)

I am standing on 3.5m wide road and now i am entering on the site . Now this will be the entrances pathway to the complex. On both side of me is the landscape areas. Now i am at the entrance lobby of cafeteria or hang out place. There will be a reception in front of me ...reception as well as that display area that is itself in the lobby.

Body movements are more as compared to all as she has created walk through and steps taken are more hence therefore she has explore the location and spaces.



MH

AR

SP

Body movement :-

Final design:-

MH (10:04 to 10:45)

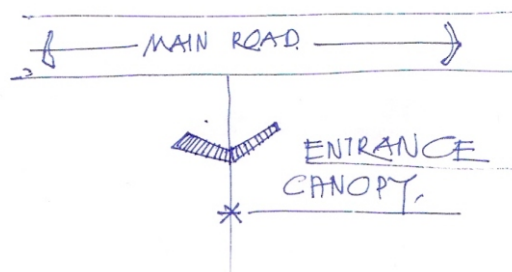
I am standing in the center of the plot probably very close to the tree and facing northnorth is in this direction.

When you entering first thing you should see the tree ok.....

When you entering the treecan i turn around .

So i am entering the site from the canopy and what i see is the tree.

The body movements are very less because he has already considered himself inside the plot. Hence he has explores the space around his body.



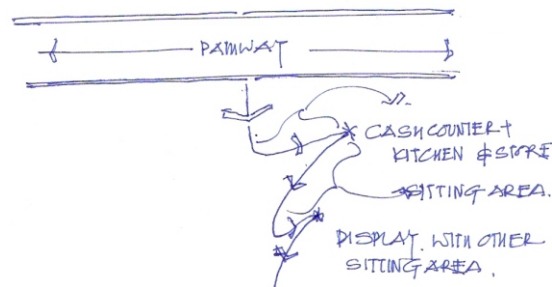
AR (16:50 to 10:16)

There is road in between and the open space behind and your site here i am entering from the road. which at 200mm level and site slopes like that. i am entering from here.

On my left side kitchen and store since the drainage is all that is here. As i am providing here ...all my kitchen facilities here the site ..left side.

On the right side as in the corner at the entrance . I have my counter area.

Body movements are more as she enters the plot and orient herself in various directions to experiences the spaces. Hence explores the locations of various activities and spaces.



SP (08:12 to 10:00)

I am standing on 3.5m wide road and now i am entering on the site .

Now this will be the entrances pathway to the complex.

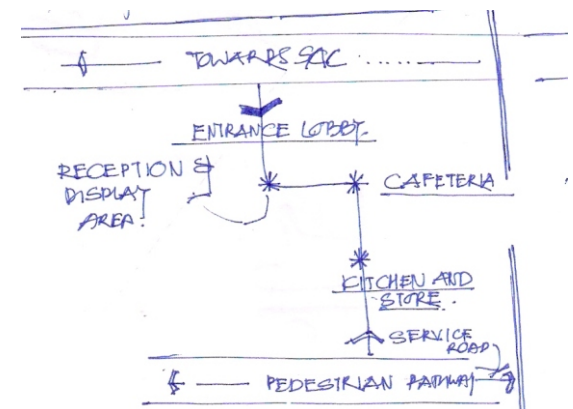
On both side of me is the landscape areas.

Now i am at the entrance lobby of cafeteria or hang out place.

There will be a reception in front of me

...reception as well as that display area that is itself in the lobby.

Body movements are more as compared to all as she has created walk through and steps taken are more hence explores the location of activities in various directions and space.



Structural details :-

MH(02:57 to 04:25)

Where you have the tree ...the stretched fabric canopy which goes tensile is partly encompassing the tree around in it .

You it is going around and sloping down on one side completely comes behind so you don't see the back drainage .

What you get a nice open area around the tree and the sitting goes 'C' or 'L' and probably open and facing the display area.

Vertical exploration of built forms through hand gestures showing the roof slope above the head and 'C' or 'L' shape sitting height

AR (15:58 to 1:35)

For display things.....more effect would be with the display as in Actually about the elevation i was telling even if you don't covered or it would be a stall and people are just sitting over and around tree. So actually you don't have to cover it. You have like open thing. You have display hanging , you have floor mounted display things . I don't want to enclose over it. And on the slope.....

Hand gestures are used to stimulate hanging or floor mounted display and hence there are vertical exploration of built forms.

SP(06:42 to 07:57)

Then small center table a small over there and just a benches around it
The close area have a glass on all sides semi open area has some ...just a big over hang coming from that main building and joint a sitting over that .

It is totally in a steel or any hi-tech 'M' section or a steel section . Which will be and over that covering material ...

Exploration of location and space are more than the hand gestures by moving and turning in various directions.

sitting layout :-

VH (07:59 to 09:43)

The whole element of benches will be continuous turning around the tree
It goes in staggered ones which comes closer to the tree and little further beyond and there are small gap between the two round benches coming in and then moving through it. These benches will reach beyond the another sitting it not a very rigid kind of a shape.
You are moving and moving through sitting kind of thing, there are small gap between the two round benches coming in and then moving through it.

Exploration of location and space

The architect is imaging the complexity of space between the two benches which is stimulated by hand gestures.

AR (09:32 to 10:52)

The place were students are sittingwere you have a Were you have a we are using only granite slabs for that ..so you have halfor some portion where you like A pergola could be a fibre material or a translucent material ...you can use that material also and tied to the tree also you have something semi open space .

The architect has imagined herself in the space hence she says you take food and sit and eat . . . hence she becomes the first person and explore the space round her body

SP(04:25 to 05:42)

It is some kind of informal sitting just a bench and a center table.

What kind of food is served over there?
Then small center table a small over there and just a benches around it

Hand gestures are used for the vertical exploration of built forms like small center table and benches .

VH

AR

SP

Space experience

Central idea :-

When you entering first thing you should see the tree ok.....
When you entering the treecan i turn around .
So i am entering the site from the canopy and what i see is the tree.

There is road in between and the open space behind and your site here i am entering from the road. which at 200mm level and site slopes like that. i am entering from here.
And on right side nahi.....
On my left side kitchen and store since the drainage is all that is here. As i am providing here ...all my kitchen facilities here the site ..left side.

I am standing on 3.5m wide road and now i am entering on the site .
Now this will be the entrance pathway to the complex.
On both side of me is the landscape areas.
Now i am at the entrance lobby of cafeteria or hang out place.
There will be a reception in front of me
...reception as well as that display area that is itself in the lobby.
When i go at the left side there is a big sitting area around me.
It is partly covered and partially openspace
When i return lobby area ...in cafeteria .

Architect explores the location of activities and spaces by moving in the confine space given to him

*The subjects explore the space around her body
The subjects enters the plot and experiences the different activity areas of the plot through body rotation in various direction like left and right side.*

The architect had the locations and spaces through mental walkthroughs she is locating each activity area one after the other.

VH

AR

SP

Front elevation:-

MH (04:28 to 05:21)

You see is the arch and then a tensile fabric behind it and a small structure roof on the left so like there is no elevation to the whole Which just happen with a whole stretched fabric between the open areas and goes and covered behind .

Which just happen with a whole stretched fabric between the open areas and goes and covered behind .

so from the front you see lots of these seating which is covered with a stretched fabric nothing major. There is no elevation treatment . It all a is very natural form

Hand gestures are used and some body movements like bending to stimulate the seating height and the clothes stretch.

AR (08:34 to 09:30)

My front elevation would be ...ok if i am standing [here](#) and at the corner. Where this athis athe wall is actually a glass . Which slopes like that and it projects out and there is a something a cone projecting so that actually moving on the road can actually see the thing there so.....

The subject is imaging the space and entering the space mentally as well as physically. She explores the space around her body.

SP (05:48 to 0:46)

The close area have a glass on all sides semi open area has some ...just a big over hang coming from that main building and joint a sitting over that .

Here the subject is standing at one place and vertical explorations of built forms like over hang are stimulated by hand gestures.

VH

AR

SP

Final design

MH (10:04 to 10:45)

Now i am standing on the road and coming into the entrance so on my left hand side what i see a lot of these parking space located next to the pavement area. Lot of tree shaded region on that side .

When you are entering you have that bamboo canopy 'X' of bamboo put and turned round and made into can copy for the entrance.

Then you are seeing the tree and tensile stretched fabric behind it which covers . Which goes down and covers the drainage area behind so you cant see it (drainage).

The subject has turned around to face the tree as well as hand gestures are used to show the direction of his view. This shows the subject has explore the space through his body rotation in left, behind, next etc.

AR (1:50 to 20:16)

I am entering ...ok ...this is that 3m wide lane.

I am parking my vehicle **behind me** on the open space . I am entering the site from the corner. That this my 10m wide road and 3m wide pathway.

Again i am standing on the road this the side is the 10m road and this is 3m wide road .

I am entering from the center. Ok.....on my **left side** is the kitchen store and all that facilities here and actually i am **entering from center** i can have countercash counter on this side (kitchen side).

I enter things one grid has gone for kitchen , the next grid i am having people who actually want to stand and eat will be in the first grid. Then second and half grid would be ..people will sit and eat and that will follow the path of the site curve site.

The subject has explore the space through body rotations as she moves in left and right . Hand gestures are used to indicate heights of counter as well as the height of the seats in the cafeteria.

SP (08:12 to 10:44)

I am walking towards . . . I am on the pathway which comes from the main road to the center. At the center there is one pattern and landscape area on both.

It is hard paved pathway . **I am walking towards the cafeteria ...a place for students.**

Now I am at the entrance lobby.

In front of me there is a reception and now left there is display fora display and some sitting kind of a thing

And **on my left** the cafeteria partially closed and semi-open space.

The architect imagines herself inside the building and has explore the location of spaces through body movement along the pathway.

Architect 1

Architect 2

Architect 3

Hand gestures and body movements :-

Initial design

The architect is using hand gesture to stimulate the objects like stone benches and wooden benches. Vertical exploration of built form like a roof, benches are also stimulated by the hand gestures most of the time he is exploring spaces through body rotation in a right, left etc. Hence lots of time the north direction is changing

All activities are placed with respect to body of the architect. Body movements at the initial stage of design is from entrance to the central area. The rest of the areas are visualized from the central area. Here the space is explored through body movement. Body movements are less and hand gestures are used to explore the built forms. Hence the north position is not changed frequently as she her body movements are less.

The architect has created her pathway to the building. She has created various zones around the pathway. Here body movements are more with respect to the path way that she has created. Hence she has explore the space according to her movement and turns in the confine space given to her.

11 Data transcript and analysis:-

Time line		Questions	Answers	Analysis
From	To			
00:27	74:02	Where are you standing ?	I am standing in the center of the plot probably very close to the tree and facing northnorth is in this direction . I see in front of the site near entry you have a curve probably a bamboo for the entrance small space ...a greenery around it. Element of some stone culture which creates the interest on the entrance. When you entering first thing you should see the tree ok..... When you entering the treecan i turn around . So i am entering the site from the canopy and what i see is the tree. Behind the tree and surround it would be a nice tensile structure , a tented tensile structure all fixed sitting seating ,like a stone benches , wooden benches ,all fixed kind of things and lots of openness to it from All side nothing which a binding space.	Initial north orientation is with respect to site tree and body movement. The subject has turned around to face the tree as well as hand gestures are used to show the direction of his view. This shows the architect is exploring the space around his body. The subject is using hand gesture to stimulate the object like stone benches and wooden benches are fixed kind of thing and also experiencing the space between the benches which has lots of openness to it from all side nothing binding space9 and similarly the exploration of various built forms are done.

Time line		Questions	Answers	Analysis
From	To			
00:00	02:59		Then the area flows into the area which is the display area . Display their elements ,notice boards and people are sitting their or they see in the front of your mind see the display always there. Probably you move on the left side where you have lots of these trees smaller larger within the tree small canteen which just jell with the whole area on which there is small shaded sloping roof. Open from all side accept for kitchen closed with walls and a counter which is on that side. Coming back to the parking is right on to the main road on the right hand side below the treesbelow the shaded area .so on that side of the road i will placed the parking. The cash counter goes with the canteen and the kitchen and pantry area.	The architect is zoning various activities with respect to his body orientation and he is standing at the center of plot to imagine various activity areas. The architects is using his body for the orientation of the site which is correct in the way he has placed the activity. Initial body movements were less he moves in one direction hence the position of north is appropriate.

Time line		Questions	Answers	Analysis
From	To			
02:57	04:25	Describe the structural details?	Where you have the tree ...the stretched fabric canopy which goes tensile is partly encompassing the tree around in it . You it is going around and sloping down on one side completely comes behind so you don't see the back drainage . What you get a nice open area around the tree and the sitting goes 'C' or 'L' and probably open and facing the display area. Display area is more like few stands of bamboo on which you have your display boards and panels And in front you ,you have display of small element whatever elements to be displayed probably there could be a small pargola. Which could be a small pargola which covers the display area it can be a sheet of plastic. The canteen is a small structure surrounded by with free seating you know very minimal kind of tables with wooden tops which are rough wooden blocks of tables and chairs very basic natural kind and not very fancy nothing no chairs nothing like that.	Here the architect has lost his orientation because he explore the space around his body and also reoriented the north direction. The architect is imaging the space individually like open sitting area, displays area, canteen. Where more of a mental walk is done by the architect and less physical walk. Vertical exploration of the build form like the sloping structure ,rough wooden blocks of tables, open area etc are used Hand gestures are used to create new objects like the sitting goes 'C' or 'L' and also indicate the height levels. Body moves only one or two steps ahead and back which is more or less a mental walk. Hence he imagine space around or close to his body

Time line		Questions	Answers	Analysis
From 04:28	To 05:21	Can you explain the front elevation?	When you entering the site what you see is the arch made out of bamboo that goes probably say cross over its as 'X' which is bend to form an arch and you enter from the that probably you see is the arch and then you see is the arch and then a tensile fabric behind it and a small structure roof on the left so like there is no elevation to the whole Which just happen with a whole stretched fabric between the open areas and goes and covered behind . so from the front you see lots of these seating which is covered with a stretched fabric nothing major. There is no elevation treatment . It all a is very natural form	The architect explore the entrance space through body movement and used lots of hand gestures for the vertical exploration of built forms like roof structure (here hands are stimulating the roof shape above the head)showing the height level of it. The hand gestures are used to create front elevation. Where as sometime vertical exploration of the structural elements like 'X' and arch are stimulated by hand gestures and body bending.
05:27	06:38	Where are you standing at the plot ?	I haven't moved far from the tree . Right now i am imaging myself standing on the arch and looking at the tree.	The subject is exploring the entrance area.

Time line		Questions	Answers	Analysis
From 05:47	To 07:53	What will be the joinery details ?	Detailing is for the entrance what you take is the bamboolots of bamboo bents tie them with a coir ropes or kahata ropes and because of the nature of bamboo it bends make a concrete pedestrian in the ground and just fix it upso that it doesn't turned up back. The tensile fabric will be fixed mostly either from the tree to the size like how you pitch the tents probably with wires, cables. So that you have supports .i don't emphasis on vertical supportsmostly it is either from the ground probably one vertical support where you need to probate up. Canteen area what i see a basic structure left expose with a tint roof..... corrugated sheet probably with lot of graphinity Leave those brick expose to paint or just do whatever free stuff they want. The pargola i was thinking about for displayi was thinking a wooden members probably there are trees around ...so between the trees probably i will take a suspension and hang that whole pargola grid on these ropes fixed it on to four sides .hang it like a open thing with no vertical supports coming down.	Here the hand gestures are used to stimulate the actions like tie them with a coir ropes. And also used to create an arch out of bamboo, also stimulate the whole fixation of the tensile roof like hand gestures shows th e direction of its fixation. Hence the body as well as the hand gestures explores various built form in the space. The subject explores the spaces and used both body movement along with the hand gestures to stimulate the particular details is considered like in the area of entrance ,canteen, tensile structure on the sitting area ,display area.

Time line		Questions	Answers	Analysis
From	To			
07:59	09:43	Can you explain the sitting layout ?	A 'C' a continuous bench goes in a 'C' continuous platformwhich is continuous which goes behind and around the trees and lot of free studs of stones just put in the front of the tableall around the table for sitting around the table . 'C' would be very rigid shape little more organic like a sitting in a staggered way . You are moving and moving through sitting kind of a thing. The whole element of benches will be continuous turning around the tree It goes in staggered ones which comes closer to the tree and little further beyond and there are small gap between the two round benches coming in and then moving through it. These benches will reach beyond the another sitting it not a very rigid kind of a shape.	The subject has explored the complexity of space where he is explaining the sitting arrangement like "You are moving and moving through sitting kind of thing, but there is a small gap between the two round benches coming in and then moving through it. Hand gestures and body movements are used to create objects like 'C' shape. The height of the 'C' shape sitting arrangement is shown by bending his body. Sitting and the gap between the two rounds of benches
09:46	10:00	Want to add in the design?	No not really	

Time line		Questions	Answers	Analysis
From	To			
10:04	11:45	Ca you sum-up the whole design ?	Now i am standing on the road and coming into the entrance so on my left hand side what i see a lot of these parking space located next to the pavement area. Lot of tree shaded region on that side . When you are entering you have that bamboo canopy 'X' of bamboo put and turned round and made into can copy for the entrance. Then you are seeing the tree and tensile stretched fabric behind it which covers . Which goes down and covers the drainage area behind so you cant see it (drainage). Organic seating under that canopy on the left of that i see this open area lot of display with a hanging pargola from tree with means of rope and hanging pargola which can be covered . Lot of these A whole character is added by the display over there. Stands of bamboo with lots of boards. You see as the notices displayed there.	The architects body orientation is with respect to the entrance of the hang -out place hence again he has reoriented the north direction. Hand gestures and body movements are used to create the new objects like 'X' shaped bamboo entrance canopy, also height of the organic seating under the canopy . Body movements are less because the architect has used his body along with hand gestures to stimulate the built forms vertical exploration

Time line	Questions	Answers	Analysis
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Beyond that on your left hand side what i see is a small canteen with lot of seating under the tree.....around the tree in and around the tree.

The architect has visualize the design imaging himself standing at the entrance. Hence the exploration of space is around the body.

Need to sum up the material?....no.....

Time line		Questions	Answers	Analysis
From	To			
00:36	02:21	Where are you standing?	Standing at the curve for iitians they will not have various levels or site becomes your table or it is like inbuilt structure . For seating i am creating various levels. it has so many counter also so actually i don't have to	At initial stage subject has explored the basic sitting layout for the iitians by imaging the site slope. Site sloping also governs the north orientation of the site.
04:24	03:39		There is road in between and the open space behind and your site here i am entering from the road. which at 200mm level and site slopes like that. i am entering from here.	Orientation is with respect to the site. Hence the subject north orientation if appropriate.
04:30	04:57		And on right side nahi.....	
05:02	05:06		On my left side kitchen and store since the drainage is all that is here. As i am providing here ...all my kitchen facilities here the site ..left side.	The architect imagine herself inside the plot hence the body is entering is inside the plot. The area are orientated in the direction of the body.
05:11	05:21		On the right side as in the corner at the entrance . I have my counter area. And my display would be	All activities are placed with respect to body of the architect. Hand gestures helps in zoning of the various activities. Exploration of locations and space are more due frequent body movement. Body does the physical walk till the center of the plot and the areas are visualized standing in one position I.e from the center of plot. Hence here the space is explore around the body.

Time line :-	Questions	Answers	Analysis
05:21	05:41	And on the slope..... Actually would be abecause there will be a granite slab. Where you actually sit or either it becomes your tablevarious in and out types	The subject explore the space through body movements and explore the area for seating. The body movement along with the hand gestures are used to stimulate the table.
05:41	06:07	Your display would be either hanging . You have like so many trees . Also ...would either hanging or ait could be mounted also like that.	
06:10	06:16	Can you tell me where are you standing in the plot?	I am actually at the center of the site . The architect is zoning various activities with respect to his body

Time line		Questions	Answers	Analysis
From	To			
06:52	07:42	Can you tell me where is the parking ?	Parking would be ok.....you said it can be out .ok sohow much is the lane ? The lane between the open space and the side there is awhere I am entering site. This open space cannot use for parking ? I will be parking my vehicles here Then there is a road in between if will be entering from this to my site.	North orientation is according to the architects body
08:34	09:30	Can you explain the front elevation of the plot ?	My front elevation would be ...ok if i am standing here and at the corner. Where this athis athe wall is actually a glass . Which slopes like that and it projects out and there is a something a cone projecting so that actually moving on the road can actually see the thing there so.....	The hand gestures and body movement are used to represent a object for entrance like a wall which is actually a glass and something projecting out.
09:32	10:52	Can you explain the sitting area?	The place were students are sittingwere you have a Were you have a we are using only granite slabs for that ..so you have halfor some portion where you like A pergola could be a fibre material or a translucent material ...you can use that material also and tied to the tree also you have something semi open space .	The subject is exploring the space and entering the space mentally as well as physically hence body movement are more.

Time line		Questions	Answers	Analysis
From	To			
11:02	11:10	Can you explain the joinery details?	I don't know.....	
11:35	12:28	What will be the color scheme of the hang out place?	Color will be bright . Thing would be like colored thing where a ...different types of colors. Its not like one color every where.... Or you can actually have different type of bulbs colored so you can give different effects in different time. You can do that also (option)	
12:36	15:35	Can you explain the sitting layout?	You know how is that you have kitchen here then athat would one...where ok ...they are the first thing aok....there are three levels . This your kitchen ...one grid and after that grid you have people who actually take and then eat... In that one could be different things ok..... You have that umbrella thing where they....circular thing and then you can stand and eat that will be the first grid and next one half grid ..something two grids you take food and sit and eat	The subject has taken 5mx5m grids as a scale factor through the body steps while designing and those are stimulated by her hand gestures. Architect has explored the space around her body hence she says you take food and sit and eat.....hence she becomes the first person

Time line		Questions	Answers	Analysis
From	To		And then at the corner where you have footpath or something that would be like even if you don't want so you just come sit , eat and chit chat types.....you actually want me to cover the whole thing . I am not going to cover the whole things. You have a mount here where you..... Granite things are placed inside so you can sit here also....these are various types was talking about.	
15:58	16:35	Can you explain display area in details ?	For display things.....more effect would be with the display as in Actually about the elevation i was telling even if you don't covered or it would be a stall and people are just sitting over and around tree. So actually you don't have to cover it. You have like open thing. You have display hanging , you have floor mounted display things . I don't want to enclose over it.	The hand gestures and body movement represent the people and their seating arrangements, also the display area around the body of the architect. Hence more of vertical exploration is carried out here. The subject explore the space and stimulate the objects in front of herself for display area like display hanging and floor mounted display

Time line		Questions	Answers	
From	To			
16:50	20:16	Where are you sum-up the entire design?	I am entering ...ok ...this is that 3m wide lane. I am parking my vehicle behind me on the open space . I am entering the site from the corner. That this my 10m wide road and 3m wide pathway. Again i am standing on the road this the side is the 10m road and this is 3m wide road . I am entering from the center. Ok.....on my left side is the kitchen store and all that facilities here and actually i am entering from center i can have countercash counter on this side (kitchen side). I enter things one grid has gone for kitchen , the next grid i am having people who actually want to stand and eat will be in the first grid. Then second and half grid would be ..people will sit and eat and that will follow the path of the site curve site. On to the top most area where actually sit and relax and chit chat on to the total area like this and you have an entry to displays and then you have wall. Floor mounted displays and you have some spaces with fibre tent or something that would be your semi open space. For standing and	The design activities are oriented with respect to subject body. Hence the north direction is reoriented. The subject has explore the various activity areas mostly by mental walk. Hand gestures and body movement are used for the vertical exploration of the various elements like counter area , eating area, and also display areas

Time line		Questions	Answers	
From	To			
00:00	02:13	Where are you standing?	I am standing on 3.5m wide road and now i am entering on the site . Now this will be the entrance pathway to the complex. On both side of me is the landscape areas. Now i am at the entrance lobby of cafeteria or hang out place. There will be a reception in front of me ...reception as well as that display area that is itself in the lobby. When i go at the left side there is a big sitting area around me. It is partly covered and partially open space When i return lobby area ...in cafeteria . I am walking on my right side i am sloping down then i have. You want display also ...so there will be a display kitchen and just behind that there will be a pantry. Kitchen and pantry and store There is the pathway that is coming from the main road to another pathway. One is coming to sac and another on the opposite side of the site . There is another pathway or service road for serving this kitchen and moving	Orientation of the design is with respect to site. The architect has explored herself inside the building and created walk through by body movement Body movement shows the direction of the lobby, reception, sitting area, semi and open spaces. Body orientation is with respect to building. Body movement describes the direction of sloping Right side orientation is with respect to body.

Time line		Questions	Answers	Analysis
From	To			
03:40	04:04	Can you come back to original place?	I think i am at the entrance	The subject physically moves toward the entrance of the building and the location of the activities is almost correct.
04:25	05:42	Can you describe the sitting layout? Maggie, samosa ,tea, coffee Etc.	You want me to describe It is some kind of informal sitting just a bench and a center table. What kind of food is served over there? Then small center table a small over there and just a benches around it	The subject is exploring the location of various activities. Less of body and hand gestures are used to represent the design elements like a center table and chair.
05:48	06:46	Can you explain me the front elevation?	The close area have a glass on all sides semi open area has some ...just a big over hang coming from that main building and joint a sitting over that .	
06:42	07:05	What is the color scheme?	It is very colorful like yellow or orange ,fresh and bright color.	
07:11	07:57	Can you explain me the joinery details of the structures?	It is totally in a steel or any hi-tech 'M' section or a steel section . Which will be and over that covering material	Here the subject is standing at one place and exploring the space around her body and there very less hand and body movements. hence north orientation is appropriate

Time line		Questions	Answers	
From	To			
07: 53	07:58	Anything to add?	No nothing	
		Tell me where are you standing?	Standing at the entrance of the hangout whatever it is?	The north orientation of the building is with respect to body.
08:12	10:44	Can you sum-up the whole thing?	I am walking towardsi am on the pathway which comes from the main road to the center. At the center there is one pattern and landscape area on both. It is hard paved pathway . I am walking towards the cafeteria ...a place for students. Now i am at the entrance lobby. In front of me there is a reception and now left there is display fora display and some sitting kind of a thing And on my left the cafeteria partially closed and semi-open space. For it has a glass partition on all three sides and a canopy out from main structure which will be acting like a semi open space for sitting And i moved on the right side i have aat the corner i have display at the backside is the entry kitchen ans store. The service road coming from the pathway which is coming down from the main road just opposite of the pathway that goes to the	The subject explore herself inside the building and created pathways through body movement Hand gestures are used less to stimulate the built forms where as it is used to represent the object like a steel canopy as compared to body movement the architect has done more of a physical walk rather then a mental walk.

12 Conclusions :-

The body movement during problem solving have given a new development in visualization and imaging abilities.

As the detailing of design starts the body movements are more dynamic where the mental and physical walk are done together. At dynamic experience of space during problem solving the body creates walkthroughs.

Exploration of space around body is mostly carried out in standing position

Body rotates to indicate the direction like left hand side ,right hand side ,front and the rear.

Vertical exploration of the built forms (tress, canopy, roof structure, sitting heights etc)through body movement and hand gestures with respect to the body.

The body represent the objects and space around it experience by hand gestures.

Exploration of location and space

The body moves along the direction of the pathway explored by the mental imagination.

The body turns and move according to the locations of the various activities

**Above experiment conducted on architects shows the their ability to solve problems without much of difficulty
This method would help architects to get involve in the design as a first person and understands the complexities of spaces.**

13 References :-

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