

## User Study 01- 3D Comprehension Test

*Usability Test and Report Prepared by Dr. Dinesh Katre, Group Coordinator*

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**Venue:** WOTR Training Institute, Darewadi

This user study is carried out before starting the actual project (watershed game design) without any real prototypes. The intention is to get the feel of villagers (users) and observe their interaction with computer and overall comprehension of 3D space.

**Objective of Testing:**

To know whether the illiterate villagers can locate and count the number of poles placed in the terrain

To check their judgment of direction and distance in the simulated terrain

To observe their fine motor skills while navigating

**Table 1. Subjects for 3D Comprehension Test**

Nos.	Name of Subject	Age	Education	Profession	Place	Lifestyle
1.	Chimaji Kodoji Avhad	65 years	2 <sup>nd</sup> standard	Agriculture	Darewadi	Rural Maharashtra
2.	Baapu Gahinath Ganage	28 years	7 <sup>th</sup> standard	Agriculture	Ganagewadi	Rural Maharashtra
3.	Mahadev Sudam	30 years	12 <sup>th</sup> standard	Agriculture	Bid/Sangvi	Rural Maharashtra
4.	Dilip Shivaji Gange	35 years	Illiterate	Agriculture	Ganagewadi	Rural Maharashtra
5.	Ujwala Tanaji Lagad	34 years	9 <sup>th</sup> standard	Agriculture	Vithekarwadi	Rural Maharashtra
6.	Ramdas Shivaji Gange	35 Years	4 <sup>th</sup> standard	Agriculture	Ganagewadi	Rural Maharashtra
7.	Gorakh Shankar Gange	35 Years	Illiterate	Agriculture	Ashti	Rural Maharashtra
8.	Gite Devidas Navnath	21 years	12 <sup>th</sup> standard	Student	Lohasar	Rural Maharashtra
9.	Raghunath Tukaram Wandekar	50 years	Illiterate	Agriculture	Lohasar	Rural Maharashtra
10.	Padam Sawalaram Wandekar	35 years	Illiterate	Agriculture	Lohasar	Rural Maharashtra
11.	Adinath Avhad	21 years	10 <sup>th</sup> standard	Student	Lohasar	Rural Maharashtra
12.	Bhagavan Sanap	38 years	5 <sup>th</sup> standard	Agriculture	Lohasar	Rural Maharashtra
13.	Ambubai Wandekar	60 years	Illiterate	Agriculture	Lohasar	Rural Maharashtra
14.	Sambhaji Gite	36 years	Illiterate	Agriculture	Lohasar	Rural Maharashtra
15.	Anjali Vaaghe	28 Years	M.S.S.	Teaching	Ahmednagar	Maharashtra



**Stratification of Subjects:**

Refer table 1 for details. The subjects included an old man (65 years) and an old lady (60 years), 9 men in the range of 28-35 years of age and three women. There were 6 illiterates and around 9 persons with different literacy levels starting from 2<sup>nd</sup> standard to a Post Graduate Degree holder. The trainers from WOTR also participated in the test. Most of them were from places like Darewadi, Gangewadi, Beed (Sangvi), Nagar, etc.

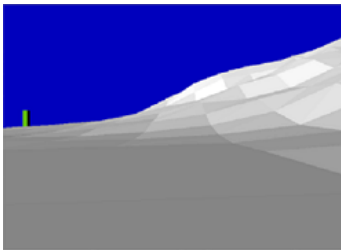
### Rules for the test:

- Give initial briefing for about 3 mnts to all subjects about the importance of their inputs. Always communicate in regional language only.
- Treat every subject with respect. Do not do anything that will intimidate them.
- Test one subject at a time.
- No fixed duration for every test.
- Avoid exposure to other subjects when the test is conducted.
- Brief every subject for max. 5 mnts duration only. (Avoid long monologues / sermon like tone.)
- Provide help to villagers only if they are stuck somewhere.
- Do not discuss the observations in front of the villagers.
- Do not reveal that they are being tested.

### Actual proceedings of the test:

The terrain model had no real colors and textures. It was a low polygon VRML model. The sky was applied on four flat surfaces that were placed around the terrain model. A simple human model was also included along with three poles placed in different locations.

Every subject required minimum 10 minutes of briefing. They needed help and guidance while using the keyboard. Only one subject was tested at a time. Every test took around 40 mnts. All three tests shown below were conducted one after the other for every subject.



#### Test 1.

##### Specifications:

- Lowpoly Terrain Model without any color, texture, environmental details.
- Three poles with same colors located in different parts of the terrain
- The subject has to navigate using keyboard and count the number of poles.
- Recognize the hills, valleys, planes and slops
- Estimate the height of a pole.



#### Test 2.

##### Change in Specifications:

- Three poles with unique colors located in different parts of the terrain



#### Test 3.

##### Change in Specifications:

- Human figure added near a pole
- Sky background added

### Observations:

1. Majority of the subjects did not recognize the computer.
2. The illiterate subjects told that they recognize the name of their village written in *Marathi*.
3. All subjects identified the hills, valleys, planes and slopes.

4. The subjects had difficulty in pressing the keys on the keyboard. They had to look down while pressing the key and look up to the screen for viewing the result.
5. The hands of older subject were very shaky and shivering. He was unable to press the key quickly.
6. The subjects who had been to school up to 10<sup>th</sup> or 12<sup>th</sup> standard picked up the keyboard operations much faster.
7. They found it difficult to count the no. of poles (without unique colours) placed in the terrain. It was easy to count the poles with unique colours.
8. The subjects could not differentiate the poles (without unique colours) placed at 180° on the terrain. They counted two poles as one.
9. The subjects were able to suggest various treatments by observing the simulation of terrain. Some of them used terms like 'Mati Palak', 'Dagadi Katte'.
10. The subjects could not measure the height of a pole. They could estimate the height of a pole in relation with the human model. They did this without our guidance. To our surprise, a subject measured the height of a pole based on the size of its projected image on the wall.
11. The subject having driving experience could easily navigate to a target placed in a terrain.
12. Most of them felt that they traveled around 50 to 100 Kms of distance after navigating from one pole to the other.
13. The subjects felt that the hill is coming closer to them and they are stationary during the fly-through.
14. The subjects were more conscious of real world than the virtual world. They always referred the local directions.
15. The trainer at WOTR inferred the location of sun by observing the light fallen on clouds. The trainer could easily suggest the possible treatments.
16. The *nalas* and *gallies* looked bigger than normal as the camera zoomed closer to them.
17. All subjects enjoyed navigations through terrain. Nobody felt dizzy while flying over the hills and valleys.

C-DAC, Pune has planed to design and conduct more user studies like this one in the coming months. The empirical outcome of such HCI tests will be used for designing the proposed system.