

Special Project

TESTING OF 'PLAY AND LEARN KIT'
(STRATEGY BASED EDUCATIONAL GAME ON VOLUME)

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APPROVAL SHEET

The Special Project, entitled

“Testing of Play and Learn Kit for School Going Children”

by Sarang Nagesh Kusale,

approved for the partial fulfillment of the requirements for
the Degree of Masters of Design in Industrial Design

Guide

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my guide, Prof. A.G.Rao, who have always encouraged me to go ahead with my project; given the inspiration & direction to thinking and provided time to time support.

I would like to express my gratitude to all those children, parents & teachers who have shown their interest and shared their views. These valuable feedbacks are the driving energy for this project.

I want to thank Ratika, Nagsen, Sachin and all my friends, for all their ever extending support, interest and valuable opinion.

Sarang Kusale

ABSTRACT

This special project is a research based feedback, carried out to understand and analyze the various factors of the 'play and learn kit'. This kit is designed for Secondary School Children from standard VIIth & VIIIth such that while playing with this kit the children will develop their spatial thinking and learn the concept of volume.

For the purpose of the testing the game the target users are chosen from different backgrounds which created a spectrum of responses to this play and learn kit which is in the form of strategic educational game, AkaarNitee.

To understand the methodology of testing a kit, a pilot test is carried out with help of a kit developed by AG Bamboo Style studio. Then the testing prototype is made and tested with the users. Videography is used to record the activities. This is an effective tool to map and analyze the various factors and also helps in consideration of time. The users and parents are interviewed to understand their background and environment of the playing and learning.

This research delivered valuable inputs in development of the kit.

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INTRODUCTION

Play and learn kit is designed for Secondary School Children from standard VIIth & VIIIth such that while playing with this kit the children will develop their spatial thinking and learn the concept of volume.

A research based feedback is carried out to understand and analyze the various factors of this game. The users are chosen from different backgrounds which created a spectrum of responses to this game, AkaarNitee.

CHAPTER-I

ABOUT PLAY AND LEARN KIT

ABOUT PLAY AND LEARN KIT



Play and learn kit is developed in Industrial Design Centre (IDC), Indian Institute of Technology Bombay (IITB), Mumbai.

This kit is developed as a project-II (2008) by Sarang Kusale during his Master of Design course, under guidance of Prof. A.G.Rao.

The kit is designed for Secondary School Children from standard VIIth & VIIIth such that while playing with this kit the children will develop their spatial thinking and perception of volume. Thus they will learn the concept of volume in a tacit way.

The 'Play and learn kit' is a strategy based educational game. It has two levels in it, as two different games which use the same hardware of the kit.

The Trekking Treasure is the first level of this game. And it is advised to play the Trekking Treasure before playing the second level game i.e. Count-n-Fun because the Trekking Treasure is chance based strategy game and the Count-n-Fun is the complex level game which needs intellectual strategy.

Akaar-Nitee

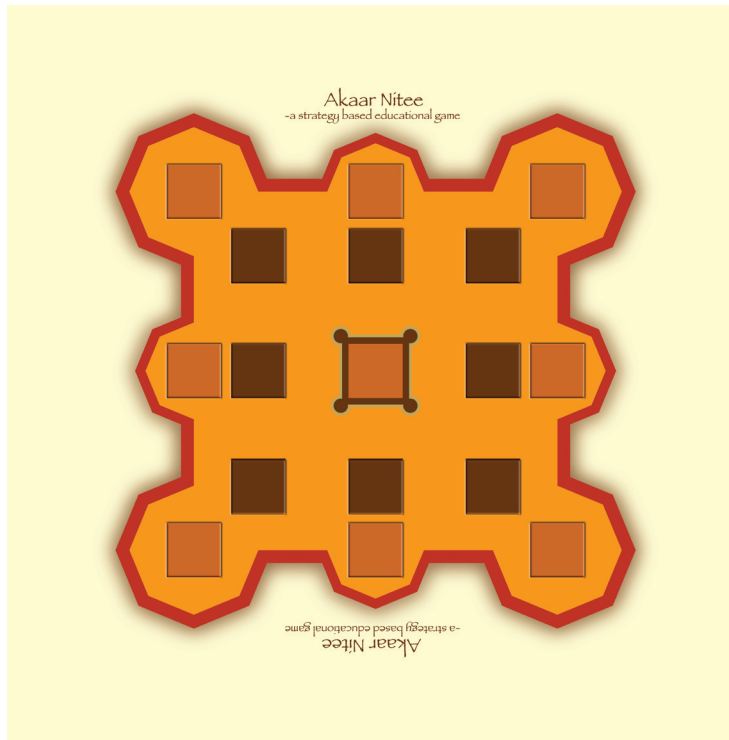
A strategy based educational game for challenge lovers...

Game Contents:

- 1 game board
- Game instructions
- 4 types of Point-blocks
(12 blocks of each type)
- 8 Coin blocks
- 1 Key-block
- 1 Die
- 2 Notepad & 2 pens

Description of contents

Game board



Point-Blocks

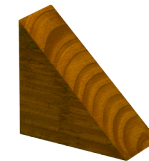
These all blocks are the $\frac{1}{4}$ th of the cube (4cm × 4cm × 4cm.)
You can perceive these by forming the cubes from the each type of blocks.
The Point-blocks are namely Beech-Tile, Brown-Brick, Orange-wedge and Yellow-Prism



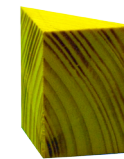
Beech-Tile



Brown-Brick



Orange-Wedge



Yellow-Prism

Coin blocks

These are the Yellow coloured tile shaped blocks having numbers printed on one side, the other side is having images of the objects used in camping. The number side is to be used for playing the 'Count-n-Fun' & the image side is for the playing the 'Trekking Treasures'.



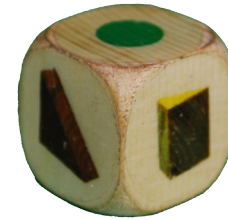
Key-block

This block is marked with the name of game on each side, i.e. one side representing the game name 'Count-n-Fun' & other one for 'Trekking Treasures'. This block should be placed in the centre of the board before starting the play.

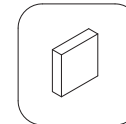


Die

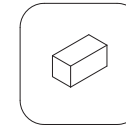
The die is cube shaped having six faces, each face of die represent a image.



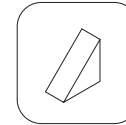
Six faces of die indicate that:



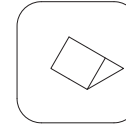
can pick up Beach-Tile



can pick up Brown-Brick



can pick up Orange-Wedge



can pick up Yellow-Prism



can pick up any block



loss of chance

Game 1 **Trekking Treasures**

You have got a special chance to go for an adventure camping in a green forest of Sahyadri Mountains. This place is full of variety of flora and fauna.

On the way you face a mysterious fog. You lost the direction enter in to a cave. The cave is enchanted with magical mystery. You observe that there are special marking on the floor of cave. There are some square pits and it's a kind of game.

Now your logic says by playing this game you can release the frozen objects. These frozen objects are having extreme magical powers.

Max-Bag

You can keep anything in this bag from a small needle to 10 feet ladder and you can still carry that bag on your shoulder, as light weight as a feather.

Speedo-Bicycle

If you want to ride on water surface you must get this bicycle.

X-ray Binoculars:

You can see through the stones and walls as if there are no obstacles.

Mag-Camera

This camera can fly in air and will take any picture based on your command.

Xtreem-Spectacles

This is enriched with night vision.

Ski-Shoes

these shoes are made from magical animals skin. If you wear this, you can walk easily on any surface having any inclination.

Magic-Tent

Any number of people can stay in this tent and this tent is equipped with all the facilities with luxurious style.

Lumino- Torch

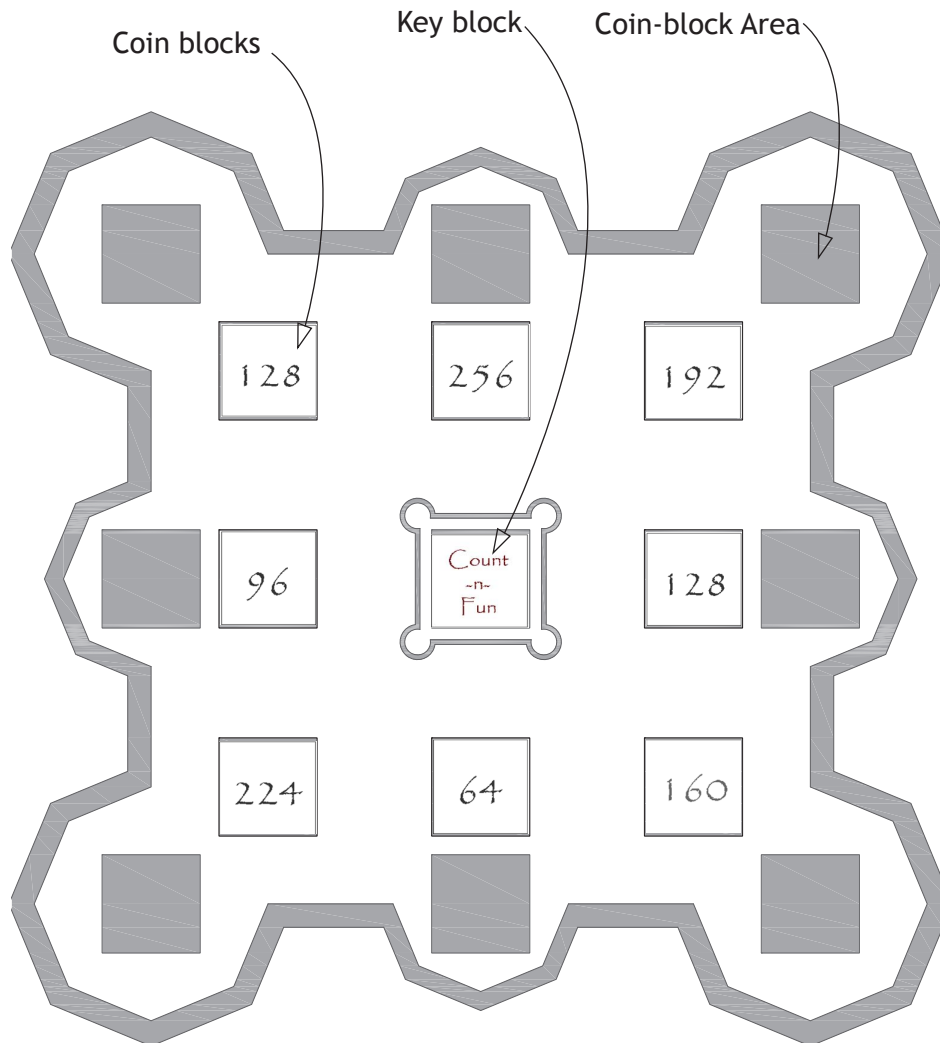
It gives a high power beam light, so that you can walk in night with your lit path like daylight.



Game 2

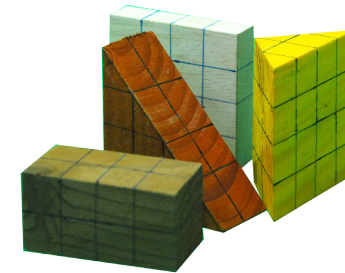
Count-n-Fun

Arrange the game board as follows



The Point Blocks

There are some Point-blocks marked with grid lines on the surface. These grids are marked at 1cm distance. Now each player count the number of smallest cubes formed by the grid lines in the respective block-shape. While counting he/she has to consider the cubes as well as half cubes. Player will surely observe that each block contains the same number of small cubes and that number is 16. This is nothing but the volume of each block. The cube having 1cm side is one millilitre (ml). Thus each point-block has 16 ml volume.



Beech-Tile

it has 1 point for its every small cube
thus the total points for this coin are $16 \times 1 = 16$ points.

Brown-Brick

it has 2 point for its every small cube
thus the total points for this coin are $16 \times 2 = 32$ points.

Orange-Wedge

it has 3 point for its every small cube
thus the total points for this coin are $16 \times 3 = 48$ points.

Yellow-Prism

it has 4 point for its every small cube
thus the total points for this coin are $16 \times 4 = 64$ points.

Playing the game

Throw the dice.
Whomsoever gets the green dot
should take the first turn to play.

For next each move player have to throw the die and selects the Point-block as per the image on the top face of die.
Now player places it in any square of Point block area.

Each player gets the turn in rotation.

To complete each cube there is a need of four point-blocks.
Each player usage their strategy and knowlege of volume to complete the cube. These blocks should placed in such a manner that the cube formed by them, should match the points defined by the respective coin-block.

The player who completes the cube by placing the forth block in the same; will win that cube only if the total points of the cube match with that of each point-block. The player can now keep the respective coin-block with him.

If the cube gets complete, and does not match with the value, then that cube is deposited back to elements' pond.

If a situation is encounted in which the arrangement of the blocks can not form a cube by placing the forth point-block, then those point-blocks should be deposited back to elements' pond, after completing all other possible cubes.

The game will continue till all the cubes get complete.

The player who collects maximum points is the winner.

CHAPTER-II

PILOT TEST

PILOT TEST

To understand the dynamic factors involved in the 'testing a Kit', the decision is taken to perform a pilot test with an available kit.

The kit chosen for this purpose is 'corruFUNtastics' kit. The CorruFUNtastics kit is designed & developed by Prof. A.G.Rao, Industrial Design Centre, Indian Institute of Technology Bombay.

The corruFUNtastics kit is developed to encourage spatial thinking and creativity.

The kit contains two types of elements

1. Bamboo sticks with round cross section(diameter 2.5mm) and in two lengths 150mm and 300mm
2. A set of shapes (21 Nos.) made from polypropylene corrugated sheet.



Image 2.01 : Corrufunstics box

The CorruFUNsticks kit

1. Close box
2. Box with open lid, showing bamboos sticks and the corrugated sheet elements.
3. Types of different shapes.

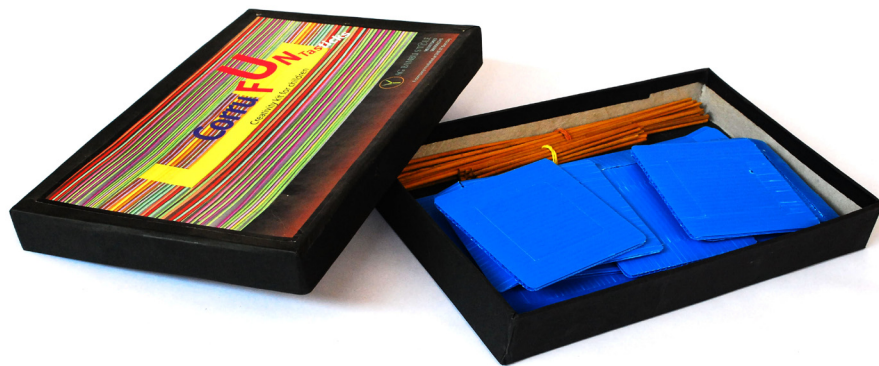


Image 2.02 : Corrufunstics Kit (with open lid)



Image 2.03 : Corrufunstics Kit with its various elements

THE FEEDBACK FOR CORRUFUNSTICKS KIT

Date of test: 31st Dec 2008

Time: 18:30 to 20:30

Details of participants:

Manik	6 th standard	(11years old)
Hitesh	6 th standard	(11years old)
Pranauti	7 th standard	(12years old)
Grishma	8 th standard	(13 years old)
Riya	7 th standard	(12 years old)
&		
Pallavi	KG	(05 years old)

Place where the feedback is taken:

Manik & Grishma's home
c/o Mrs. Shubhangi Ramugade, Room No. 74,
Building No. 10, H-2, Lake Side,
Indian Institute of Technology Bombay, Mumbai.

Conducted by IDC students:

Sarang Kusale
Nagsen Nandurgekar
Ratika Bakshi

To document and analyse the process the following techniques were used:

Observation
Notes
Photography
Videography
Discussion with children before and after the test
Group Discussion among the members who conducted the test

Introducing the kit to the children

The 'CorruFUNsticks kit' was introduced to all the present children. The various elements including the shapes of the corrugated sheets and the bamboo stick were shown. The joinery method of inserting the bamboo sticks in to the corrugated shapes was demonstrated. After that the kit is given to children and they were told to make anything or any object from the same kit.

As there was only one kit is available, we have divided this activity in turns. Hitesh and Manik were the first group who tried hand on the CorruFUNsticks kit. To keep others busy during this time we have provided them paper-sheets and pen and told them to draw the things which they want to make from this kit.

Process

Children took the kit and started separating out each shape from the pack of corrugated shapes.

Children started with deciding and creating some shapes.

Then they have tried the planner shapes (corrugated-sheet) to form an arrangement which is near by their predefined image in mind.

The joining of the elements was taken in to consideration after these trials with the planner forms. They looked for the other given content, which are the bamboo sticks.

They had tried to insert the sticks in to corrugated shapes and join them together.

In the corrugation shapes the sticks can be inserted only in parallel to the corrugations. So they tried and figured out the hinges/creases available in some pieces. These experiences resulted in the other shapes, which were thought considering these joints. These shapes were more complex than the primary shapes created by them.

Points Observed: (for children of age 11 to 13 years)

Form in the mind

From the given corrugated shapes, they tried to build home, houses, buildings this initial attempts covers the planner form.

As they figured out the joinery details, they started thinking about the other shapes such as Chair, sofa, See-Saw etc.

This resulted in to more complex forms.

The earlier imagination is restricted towards the real shapes which are made up of planner sections. The abstraction of the real life objects came into picture.

In their initial attempts they tried to make a replica of the image in mind. But later on they have switched to making representation of image in mind.

This is figured out from the conversation made with the children while they were thinking and making the objects. The video recording is also very usefull tool in analysing this minor details.



Image 2.04 :Chair made by Manik



Image 2.05 :(From L-R) Grishma, Pranauti and Riya

Other observations

The presence of parent created tension in children. Parents want to improve the performance of the kid, therefore they starts instructing the children.

The two boys viz. Manik and Hitesh they have tried to make some objects from the kit. They have fixed a form in mind and want to make nearly same using the kit, but they were not able to satisfy themselves by the form made by them. Hitesh took a paper and pencil and started drawing sketch of horse. After struggling some more time(after 40 minutes) Manik had lost interest from the kit, and went for playing outside.

Grishma, Pranauti and Riya started making things. The primary attempts covered the forms of house, chair and bed etc. This group is shown more involvement in kit.

Grishma has made some chairs and the bed, but it is observed that she was thinking more before making, she was worried about her performance. But later on she is also com up with a idea of flowerpot.

Pranuti and Riya were busy with kit for a long time. And they were adding details to their objects. Riya had made a swing in her first attemps. and later on she made a prism shaped house. having two floor in it.



Image 2.06 :Pranauti and Riya busy with making objects



Image 2.07 :
Riya: playing with see-saw

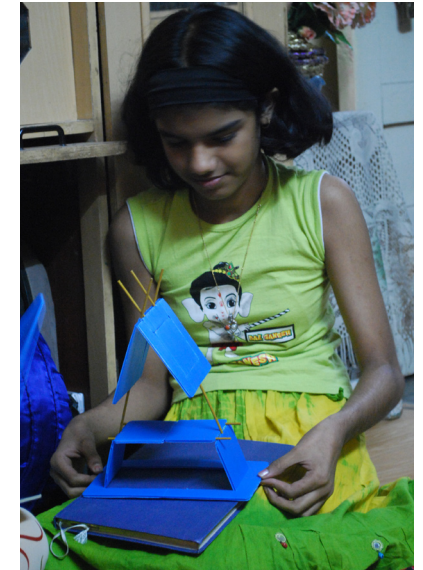


Image 2.08 :
Riya: making a home

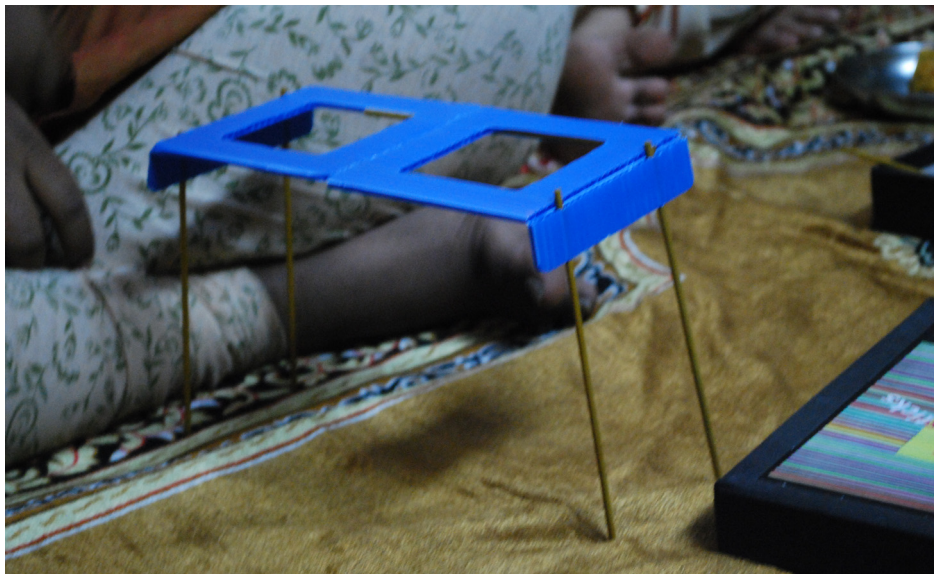


Image 2.09: A bed made by Grishma



Image 2.10: See-Saw made by Riya



Image 2.11 :Pallavi involved deeply in making objects

Points Observed: (for child of age 5 years)

Pranuti's little sister, Pallavi (5 years old) accompanied with her. Pallavi was told to draw on the paper. and she made herself busy in the same for a long time, after making drwaing for 20 mins she was went outside for several times. After about 50 mins she also got interested in the kit and now she also wantted to join in the group. She took several elements and was playing with them for about 20 minutes. She was involved deeply in trying out the kit and making some objects.

She gave various names to the things made by her. A form she was refering as a mask (refere image 2:12) is converted in to hat (refere image 2:13), which also become viewing goggles (refere image 2:14) and horns (refere image 2:15), and to the same thing she named as 'purse' (refere image 2:16).



Image 2.12 :



Image 2.13 :



Image 2.14 :



Image 2.15 :



Image 2.16 :

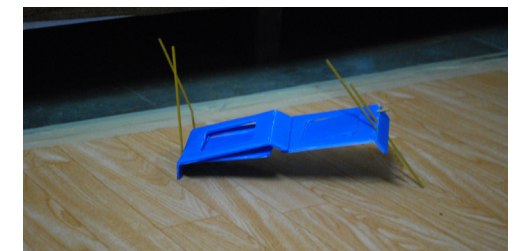


Image 2.17 :

INFERENCE

To organize the test the following major factors are observed.

Contact and communication:

In this case we have contacted parents and told them briefly about the nature of test.

The description of planned test and our basic requirement should be communicated briefly and precisely to get desired condition.

Participant:

The target user, their age-group, required number for conducting a test, background of the user etc. are the details of the participants. These details should be decided before passing the message to the contact person. The variation in these factors affects the performance of the test.

Documentation:

As a research requirement this is one of the major parameter. A video recording is a preferred tool to analyse the details and behaviour of the user.

To understand the thinking process of the user, the game-tester should talk with them and find out their way of perception and way of thinking and analysing.

Assist them by asking some questions and try to figure out what is there in their mind? What they are trying to make with the kit? how they are making it? Are the constraints of the kit creates problems?

The observations made during test should be written and after the test these points should be discussed.

Environment:

To get the best results of the test the environment should be as neutral as possible. Conducting the feedback in the user's place is preferred option as it is comfortable environment for the user.

The environment may contain some factors which causes distractions to the user. Try to minimise these distracting factors and create a controlled environment.

The presence of parents or spectators creates tension on the user, and which will affect their performance.

CHAPTER-III

USER FEEDBACK -1 FOR PLAY AND LEARN KIT

(AKAARNITEE- A STRATEGY BASED EDUCATIONAL GAME)

USER FEEDBACK- 1

Date of test: 12th Jan 2008
Time: 15:00 to 17:00

Details of participants:

Nitin Dongre	8 th standard	13 years old
& Sarang	(Game Tester)	25 years old

This game is played between Nitin (user) and Sarang (Game tester). For the detail information of the user please refer to user information-1.

Place where the feedback is taken:

VCPD Studio,
Industrial Design Centre (IDC)
Indian Institute of Technology Bombay, Mumbai.

Conducted by:

Sarang Kusale

To document and analyse the process the following techniques were used:

- Observation
- Notes
- Photography
- Videography
- Discussion with user

TESTING THE GAME

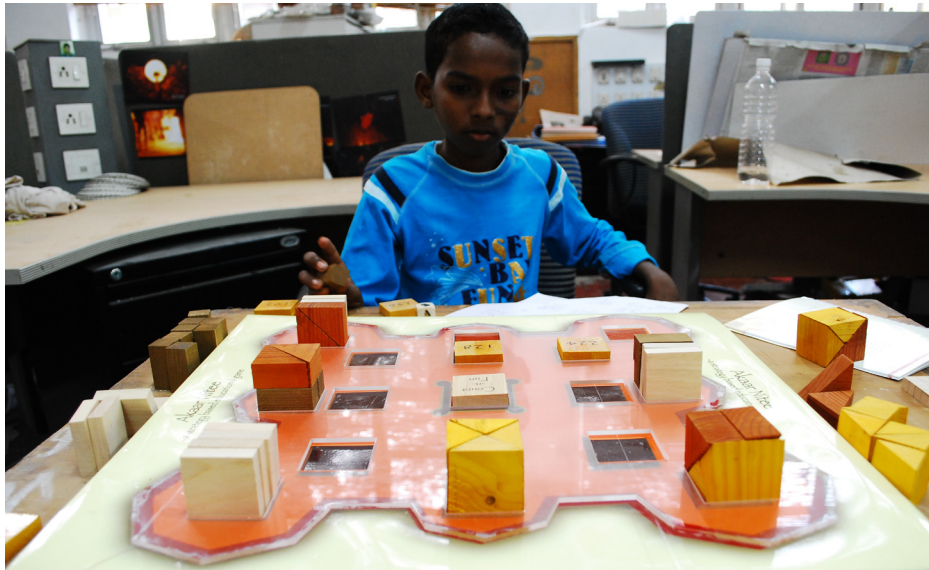


Image 3. 01 : Nitin is playing the game, AkaarNitee

Testing the game

The game is opened in front of user. The user got excited when he saw the colourful game board. He also got curious about the various elements, which includes Coin-blocks, Die etc.

The user was excited to play this game, as he never played any such kind of game before which has so many elements in form of blocks.

Game Instruction:

Nitin is from Marathi medium school and he faced the problem with the rules written in the English Language. He was unable to read and understand the rules and game instructions

The game-tester, Sarang had explained the rules with the help of visuals provided in the game-instructions. The visuals were understood easily by the user.

As the AkaarNitee has two games in it. The Trekking Treasure is supposed to be played first.

It is observed that the user got excited with the magical power of the things. This resulted in boosting his interest in the game.

The following points are observed after introduction of the game:

The user had quickly understood the use of die, he was allowed to interpret the role of die and he guessed it correctly. But he was confused with the function of the green-dot face. Then the game-tester had told him that one get the green-dot after rolling the die, he is allowed to choose any block from the available four types of blocks. The die-face having cross mark is strongly perceived as 'loss of chance'.

PLAYING TREKKING TREASURE



Image 3. 02 : Nitin is deciding for next move.

Playing Trekking Treasure:

The fascination of the story made the player excited to play the game.

The game board is arranged by the Nitin as per the image provided on the instruction card. He had tried to keep the point-blocks exactly at the same position as they are in the image. Then he was told that he is free to arrange them in any sequence but should be kept only in point-block area.

The game is started with the dice throw. The starting player is the one who got the first green dot. The use of dice is easily understood by him.

The game is started by placing the gained coin-blocks. While playing

it is observed that the Nitin was preferring to place the same type of blocks together. he was excited to collect the magic-objects (Coin blocks)

He had faced problem in placing the yellow-prism block.

Collecting the point-blocks helped in keeping the score, there is no need to write these points, gained by the player in while playing the game

Sarang had intentionally loosed some chance of completing forming cube, to encourage the interest of the Nitin.

There were some spectators, who had shown their interest in the game. There were some local factors causing distractions, such as spectators are coming in, some talking person. But the player's attention was on the game. This shows that the player was engaged in the game.

Nitin won this game as he revealed five magical objects, and Sarang is revealed three of them. The Nitin was fascinated by the magical powers of those objects.

The player was interested in playing the Trekking Treasure again. He prepared the game board immediately for the second play.

He played the second game smoothly. But he again faced difficulty in arranging the Yellow-prism block, in combination with the other block. This game is resulted in tie as both players got equal number of magical objects.

Time for First play: 8 minutes.

Time for Second play: 7 minutes.

PLAYING COUNT-N-FUN

Playing Count-n-fun

Time taken for playing: 50 Mins

Count-n-fun is the next level game in the AkaarNitee.

Before playing this 'Count-n-Fun' game, it is recommended to play Trekking Treasure first, to get familiar with the basic game strategy.

The game-instructions were told to the Nitin and a writing pad with a pen is provide to him.

The grid-marked blocks were shown; and he was told to calculate the number of small cubes (1 cubic cm), per each of the block. The procedure of counting was explained with the help consideration of full-cube and half cube.

Counting this number for Beach-Tile block and Brown-Brick block was easily done by him. He faced problem in counting the same for Orange-Wedge block and for Yellow-Prism block. This problem was faced due to the confusion created in counting full-cube and half cube and also due to the geometry of those blocks. After assisting him in counting he had successfully found that the each block contain 16 such cube of 1 cubic cm. Then he related this with concept of volume taught in school.

As per the game instructions the each 1 cubic cube of coin-block has some points. Nitin counted the point-value of each coin-block with the help of game-instruction card.

Nitin easily understood the condition of matching the points of formed cube to the respective point-block.

The game started by him as he got the green dot. In first move he faced problem in placing the coin-block, so placement is done randomly without doing any logical calculations. In this game the time

taken to decide the move is much more than that of taken in Trekking-Treasure. He needed to revise the points of the each coinblock, by referring to the instructions. He preferred to place same kind of coin-blocks together to form a cube. After following the same methodology, he realize that to fulfil condition of some pointsblocks, there is need to combine two types of coin-blocks to form respective cube. He was then tried different combinations, by doing mathematical calculations with the help of provided writing pad. For next each move he was calculating points with the help of the writing pad. It is also observed that, he was planning some next moves and predicting for the required coin-block needed to complete the respective cube.

The choice of coin-block was decided by luck factor with the help of die. So whenever he was getting green-dot, i.e. the freedom to pick any block, then it was observed that he is selecting the coin-block according to the calculations made by him. Thus he learned how to play using strategy.

SOME IMAGES WHILE PLAYING COUNT-N-FUN



Image 3. 03 : Nitin is calculating to decide the next move



Image 3. 04 : Nitin is deciding the move

BRIEF FEEDBACK OF GAME FOR TEST-01

Ability to attract repeat play:

Yes

Entertainment/ fun:

The player have enjoyed the both the levels of games

Appeal of fantasy

The story of trekking treasure created fascination and increased the interest of the user

Factor of socialization

The players were sharing their knowledge as they want to win in the game, because they were aware of that a wrong move by opponent affects the further moves.

Play interaction

The players showed a deeper level of interaction between them; as they were deciding the moves by discussion.

Conflict

The opponents decision affects the next players move and he/she needs to decide the strategy accordingly. Therefore the players were co-operating each-other time to time

Education due to game

It offered indirect learning. Player learnt the concept of volume in tacit manner. The counting of the cubes in the coin-blocks offered direct learning of the counting volume of the same. The perception of the volume is also learnt indirectly by experiencing the blocks.

Chance of winning

The chance of winning is dependent upon the understanding of the game and the strategy followed by the player.

Basis of play

Player found the graphics and elements were interesting and attractive.

Players were involved in game all the time. As there is uncertainty maintained by the game, the players kept themselves engaged.

Degree of problem solving challenge

To complete a cube the player had to think about the possible arrangements of the cube. Thus the player's strategy was based on intellectual decisions.

Luck and strategy

The die creates a chance element, and offers the luck factor in the game. The placement of the blocks is totally dependent upon the strategic decisions of the player. Thus there is balance in between luck and strategy factors.

Degree of playfulness

Activity based

Degree of control over choice of board, adjustments, investments

In setting up the game the players can decide the variations as the layout and rules of the game.

Ability to hold interest

It is observed that the game can hold interest for a long time. (about 1 hour 20 minutes)

Fluctuations of tension/ uncertainty in play

The uncertainty is maintained through out the game. In the early game and in mid game the uncertainty is more than that of the end of the game.

Control on pace of game

The control on the pace of the game was totally dependent upon the time taken by the players for making each decision. For some instance the player experienced tough situations, where he took longer time to decide the next move.

Frustration of player

The placement of the Yellow-Prism coin-block in Count-n-Fun game, was experienced as a difficult situation by the player, as there were calculations involved in making a decision. The player was observed under tension in these movements.

Possibility of player becoming an expert

With intellect the player can become expert in this game. The practicing also help in developing the player's performance.

Maintaining score

The provided writing-pad were used to note down the score.

Watchability

The spectators were shown their interested in the game. As they were unaware of this game, they were not able to pass any clue to help the player.

Interpretability and understanding of players nature and profile

By observing the play, players' nature can be understood. In this case, the player like the game because at every move he faces challenges to perform.

Ability to generate variations

The game offered variation in terms of structural basis. There is also variations in the method of playing the game.

Ability to generate levels in the game (complexity levels)

Yes. There are two different levels offered in the game AkaarNitee viz. Trekking Treasure and Count-n-fun.

Involvement of players during the play?

It is observed that the players were involved in the game from start to end. The opponents were also busy in deciding the next possible moves by doing the calculations. The active player as well as opponent were thinking about their own strategy during the play.

How location and hardware specific is the game?

One children can carry this game easily.

Due to the size the game becomes location specific and should be played in house, open areas and in hall/ room etc. The game is not suitable to play in during travel.

Is all the hardware essential all the time?

Yes.

Is there a redundancy in elements?

Most of the the elements were used in the game. There were several blocks are left in the elements' pond; which are provided as extra elements.

USER INFORMATION- 1



Name: **Nitin Samadhan Dongre**

Age: 13 years old

Standard: 8th Division: B Birthdate: 12th Sept 1995

School: Aman Core Vidyalaya, Pratapanagar, Bhandup, Mumbai.

Class Teacher: Mr. Chaudhari

Home Address:

Room no. 4, Madhane Chawl, Hanuman Tekadi,
Pratap Nagar Road, Bhandup, Mumbai

Contact No. +91 9322470353

Contact person : Vilas-mama, Uncle; stays next door

Father's Name: Samadhan Dongre

Occupation: Labour work in Mahanagar Transport

Income: Rs. 3000/- per month

Mother's Occupation: Cook in a Shakti Mess (IIT campus)

Income: Rs. 1500/- per month + Food allowance

Other family members: One Brother, Studying in 11th Standard

Economic Condition of family: Lower Income Group

The user's opinion

About the board-games:

Snakes and Ladders	Played	Likes very much
Ludo	Played	Likes very much
Monopoly	Not played	-
Business	Not played	-
Navavyapar	Played	Likes
Lifestyle	Not Played	-
Chess	Not Played	-
Puzzle (time activity)	Not Played	-
Tic-Tac-Toe	Played	Likes very much
(pencil paper game)		
Dots and lines	Played	Likes very much
(pencil paper game)		
Carrom	Played	Likes very much
Challas	Played	Doesn't like
(Traditional game)		Thinks its girl's game.

About Akaarnitee:

Nitin showed interest in playing the Akaarnitee again.

Nitin likes the akaarnitee game, specially the game-1, Trekking Treasure.

CHAPTER-IV

USER FEEDBACK -2 FOR PLAY AND LEARN KIT

(AKAARNITEE- A STRATEGY BASED EDUCATIONAL GAME)

USER FEEDBACK- 2

Date of test: 14th Jan 2008

Details of participants:

Chandita	7 th standard	12 years old
&		
Vandita	6 th standard	11 years old

For the detail information of the users please refer to user information-2A & 2B.

Place where the feedback is taken:

Chandita's Home
Vidya Niwas, Hill Side,
Indian Institute of Technology Bombay, Mumbai.

Conducted by:

Sarang Kusale

To document and analyse the process the following techniques were used:

- Observation
- Notes
- Photography
- Videography
- Discussion with user

TESTING THE GAME

Introduction

Chandita and Vandita are friends and staying in the same building. They play together. This play includes indoor as well as outdoor games. And even sometime they also study together.

The feedback of AkaarNitee, was taken in Chandita's home, where they usually play board games. Parents were told to carry on their own activities and not to interfere during the test.

Understanding the game-instruction

The game was opened in front of them.

They like the colourful game board. They were also seemed curious about the various elements, which include Coin-blocks, Die etc. This curiosity made them excited to play the game.

They took the game-instructions and started reading for the gamelevel-1 i.e. Trekking Treasure.

They prepared the board, by arranging Key-block and Point-blocks, exactly as per the illustration provided in instruction-card. They were told that they have freedom to shuffle the point-blocks.

The images on the point-blocks were interesting for them. But they got confused with the points printed on the other side. They were told that these point are for another level i.e. Count-n-fun, and they were suggested to refer game-instructions for more details.

Chandita read the instructions and made Vandita understand the same. She explained her about the four types of coin-blocks, formation of cube and releasing the respective magical objects (i.e. Point-blocks).

Both of them needed to be explained about the formation of cube by using four numbers of point-blocks.

Chandita picked the die and started guessing the function of each face. She explained the use of die to Vandita. The four images for respective coin-block are understood immediately. The cross marked face of die is highly perceived by both of them as loss of chance.

The die-face having Green-dot is perceived as playing again or having a double chance. So the game tester suggested referring game instructions, where it is mentioned that Green-Dot will give a freedom of choosing any coin-block.

Chandita had problem in understanding the sentence, ".....the player has unlocked the missing object"

There was need to explained this point, by showing the completion of cube and gaining respective Magic-object (i.e. Point-blocks).

The other instructions are understood easily by Chandita. And she explained the rules to Vandita. They were switching the instruction manual to read.

Chandita thought one need to complete the cube in one chance, which is actually not a case. But immediately she corrected that players have to play one by one as per the rules.

(8 min)

Vandita has a curiosity, why there are writing-pad provided in game kit. She was told the writing pad will need while playing Count-n-Fun.

These writing pads are not needed in Trekking Treasure.

Understanding the game instructions took about 8 mins.

PLAYING TREKKING TREASURE



Image 4. 01 : Vandita and Chandita playing the game, Akaarnitee

Playing Trekking Treasure:

(time: 8:45)

Playing Trekking Treasure started at

They were first tried for getting a green dot to start the play. After 2 loops of die-throw Vandita got green-dot, and she chosen a Yellow-Prism block to place on the board. Then Chandita thrown the die, who got Brown-brick. But she had a confusion that she not got green-dot so she cant pick that block. Then she was told that game is started when Vandita had played, so she need continue by placing the block, which she got from die throw. (time: 9:13)

Vandita got a cross and she lost a chance to pick and place a block. Chandita played and placed the collected block. Vandita thought she need to lose a chance, then Chandita explained her, that she have already missed a chance in last turn due the cross mark, and now she should throw the die again. (time: 9:36)

Then the game was played smoothly for next some turns. It is observed that the players used to throw die on the board itself, and due to the blocks placed on board the die sometimes stands tilted, so there was problem in reading the die decision.

Chandita has a query, are they allowed shuffling the elements from coin-block area. (10:57)

It is also observed that they preferred to place the similar Coin-blocks together to form a cube. The first three completed cubes were made from of same kind of coin-blocks. The first combination of two different coin-block was made by Chandita. (time: 12:54) and the same is completed in a cube by her (time: 13:41).

The Game is played smoothly for next couple of minutes.

Then Chandita was trying to place a Yellow-Prism in an arrangement of two Orange-Wedges, she faced problem in fitting them such that a cube can be formed. She was advised by the game-tester that according to game instructions she can rearrange the blocks to form a cube. After struggling for a minute she was able to fix the arrangement.

They were helping each other in arranging the blocks to accommodate the new entrant.

They have completed the game. And at the end of it Chandita has 6 magical objects viz.

Torch, Binocular, Shoe, Tent, Camera and Cycle. And Vandita has two magical objects viz. Bag and Sunglasses.

Chandita won this game.

(Time 19:00)

Time taken for this play was 10 min 30 sec.

Both of them like the game. And they wanted to play it again. “We’ll play this game once again and then we’ll play the second game”- Vandita.

So immediately they rearranged the board for playing Trekking Treasure.

Arranging the Point-blocks was done quickly, they haven’t use instruction card for this time.

The game is started by Vandita who got the first green dot.

They played the second game without any confusion, which shows that they have understood the rules of game very well in the last play. It is also observed that the moves were quicker as compared with that of the first play.

Vandita is happy because she again got the Sunglasses as point-block. The emotional attachment with the elements of the game is experienced through this act.

(23:11)

They were advising each other for some moves.

“Where should I place this?” - Vandita

“I don’t know. Play on your own”- Chandita

Though it is observed that they were helping each other in some moves, it is also noticed that at some time they keep some secrecy.

There is excitement till the last movement of game about who will get the points of the last cube.

After completing the game, they both have equal number of magical objects (point-blocks) i.e. 4 for each.

Thus the game resulted in a tie.

(time 26:30)

Time taken for this play was 7 min 30 sec.

PLAYING COUNT-N-FUN

Now both of them were excited to play the second game, i.e. Count-n-Fun.

They have arranged the board immediately. (time 29:04)

They were to find out a coin-block from each type which has a grid pattern marked on its every surface. They took out those blocks. Now they were told to count number of smallest cubes formed by those grid lines and demonstrate each other.

They have successfully calculated the 16 number of cubes per block. Chandita explained Vandita the counting using full cube and half cube in Orange-Wedge block.

The count is the volume of each block.

Vandita read the game-instructions including the explanation the point system

On the provided writing pad, they noted down the points of each blocks, e.g. $1 \times 16 = 16$ points for the beach tile.

The game was started. The first completed cube had not match with its respective point-block so it needed to be deposited back in elements pond. And from now onwards they were playing with logical decisions to match the points of cube. The second completed Cube satisfied the condition of points and Vandita has got the respective points.

43.30

The third completed cube is deposited back to elements pond.

Now there was excitement, and they Chandita started predicting next required blocks to fulfill the condition of points.

In this game they both were thinking and deciding next move by taking a help of some calculations done on writing pad. (45)

Chandita advised Vandita not to place the coin-block in an arrangement, as this was going to spoil the arrangement.

(45:45)

They were deciding their own strategy. And at some point advising each other so that they can complete the cube, and some time they are following negative playing.

Chandita was playing logically, but Vandita still playing with some random decisions. (48:00)

While playing they were having discussion about the moves, but they were discussion only few facts, the other thought plans they were keeping in mind to built their own strategy.

The calculations done on writing pad are much helpful in deciding the moves. These notes were used as secretes.

(60:00)

There were deeply involved in the game till the end.

Chandita scored 832 points and Vandita scored 416 points.

Thus Chandita won this game.

(72: 00)

Both of them like the game very much. They felt this game is very different from the other games.

Time taken for this play was 44 minutes.

PLAYING COUNT-N-FUN



Image 4. 02 : Vandita and Chandita playing the game, Akaarnitee

USE OF WRITING PAD
BY CHANDITA

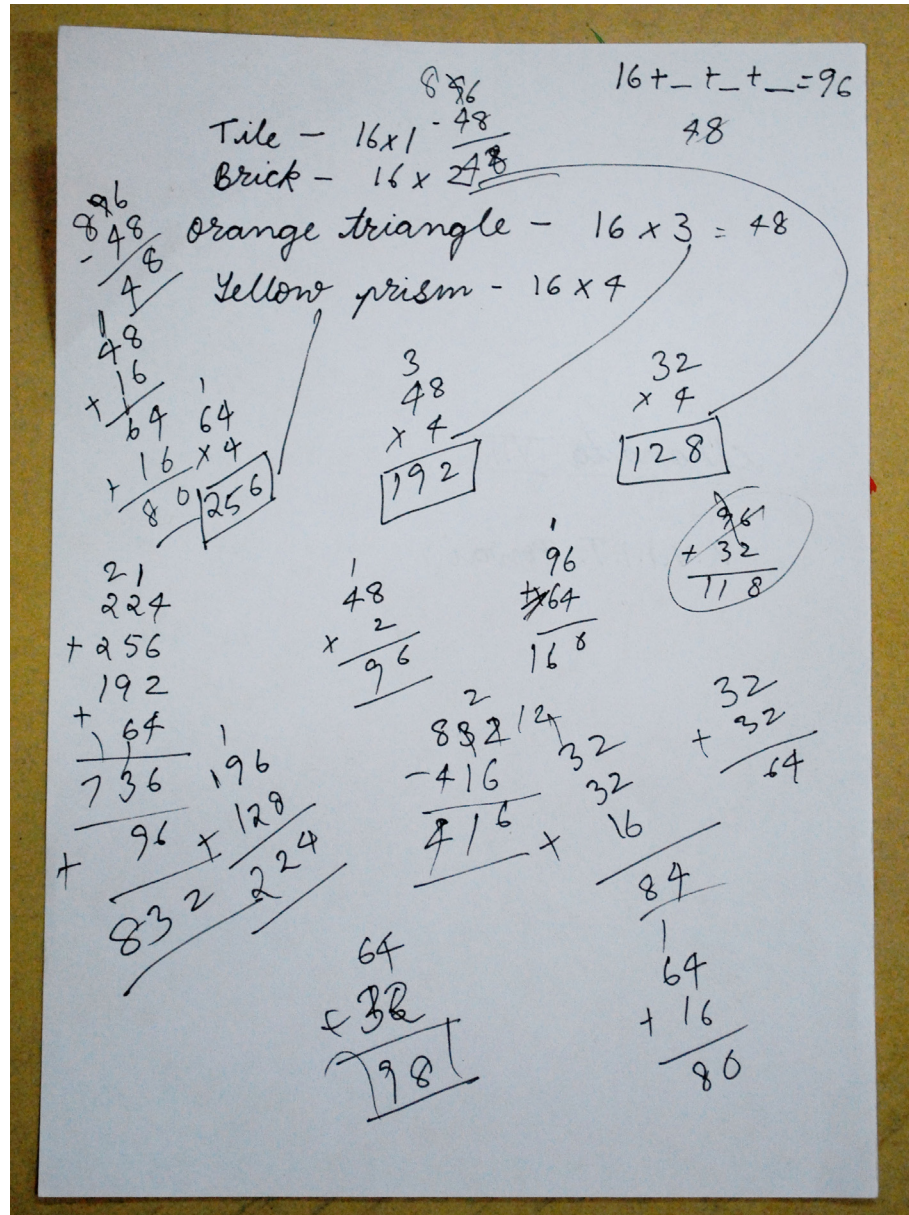


Image 4.03 : Use of writing pad by Chandita



Image 4.04: Chandita was doing calculations to decide the next moves.

USE OF WRITING PAD
BY VANDITA

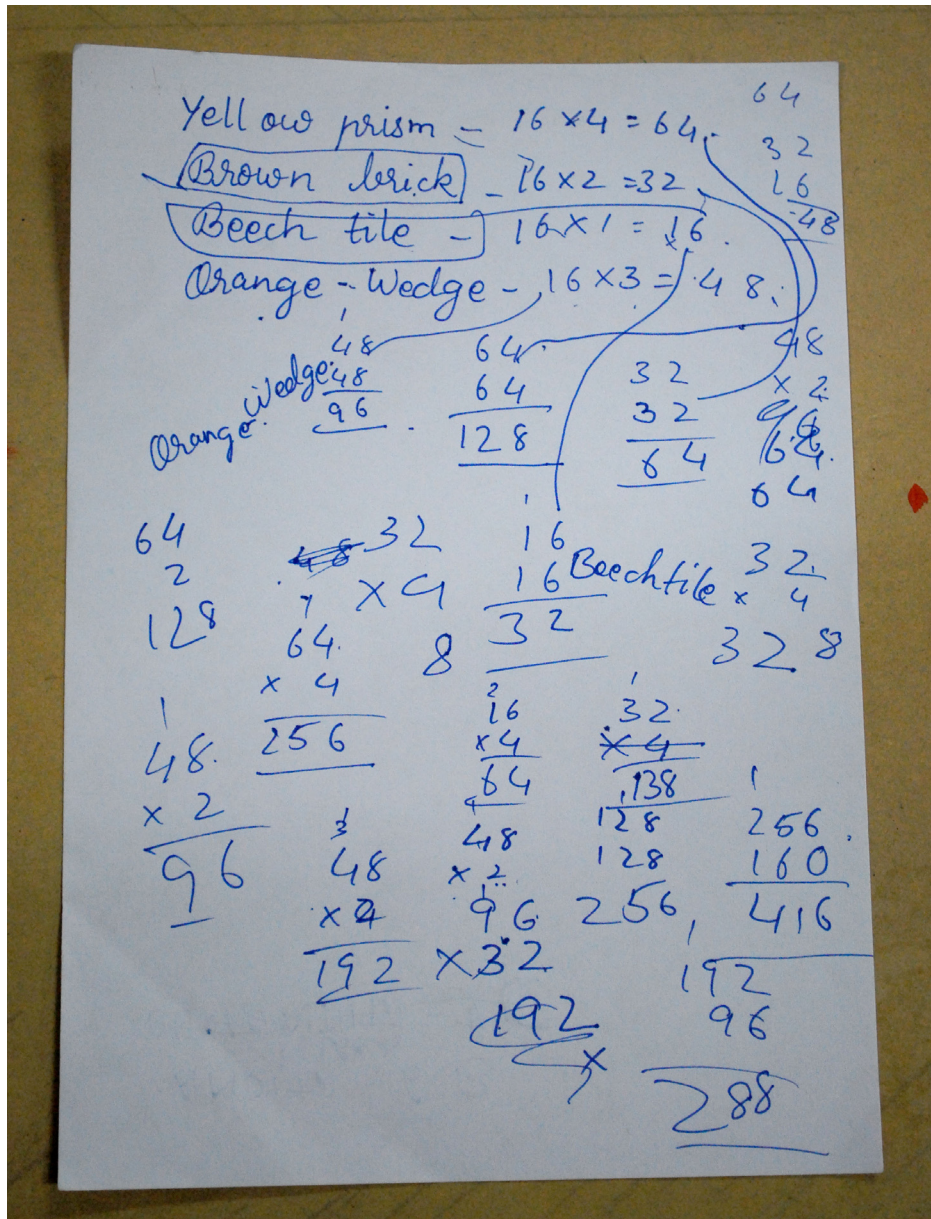


Image 4.05 : Use of writing pad by Vandita



Image 4.05: Vandita was doing calculations to decide the next moves.

BRIEF FEEDBACK OF GAME FOR TEST-02

Ability to attract repeat play:

Yes, very much.

Entertainment/ fun:

The player have enjoyed the both the levels of games

Appeal of fantasy

The story of trekking treasure created fascination and increased the interest of the user

Factor of socialization

The players were sharing their knowledge as they want to win in the game, because they were aware of that a wrong move by opponent affects the further moves.

Play interaction

The players showed a deeper level of interaction between them; as they were deciding the moves by discussion. They were also observed keeping some secrets, resulted in strategic play.

Conflict

The opponents decision affects the next players move and one needs to decide the strategy accordingly. Therefore the players were co-operating each-other time to time

Education due to game

It offered indirect learning. Player learnt the concept of volume in tacit manner. The counting of the cubes in the coin-blocks offered direct learning of the counting volume of the same. The perception of the volume is also learnt indirectly by experiencing the blocks.

Chance of winning

The chance of winning is dependent upon the understanding of the game and the strategy followed by the player.

Basis of play

Player found the graphics and elements were interesting and attractive. Players were involved in game all the time. As there is suspense maintained in the game, the players kept themselves engaged.

Degree of problem solving challenge

To complete a cube the player had to think about the possible arrangements of the cube. Thus the player's strategy was based on intellectual decisions.

Luck and strategy

The die creates a chance element, and offers the luck factor in the game. The placement of the blocks is totally dependent upon the strategic decisions of the player. Thus there is balance in between luck and strategy factors.

Degree of playfulness

Activity based

Degree of control over choice of board, adjustments, investments

In setting up the game the players can decide the variations as the layout and rules of the game.

Ability to hold interest

It is observed that the game can hold interest for a long time. (about 1 hour 10 minutes)

Fluctuations of tension/ uncertainty in play

The uncertainty is maintained through out the game. In the early game and in mid game the uncertainty is more than that of the end of the game.

Control on pace of game

The control on the pace of the game was totally dependent upon the time taken by the players for making each decision. For some instance the player experienced tough situations, where he took longer time to decide the next move.

Frustration of player

The placement of the Yellow-Prism coin-block in Count-n-Fun game, was experienced as a difficult situation by the player, as there were calculations involved in making a decision. The player was observed under tension in these movements.

Possibility of player becoming an expert

With intellect the player can become expert in this game. The practicing also help in developing the player's performance.

Maintaining score

The provided writing-pad were used to note down the score and it is also used to decide the strategy of play.

Watchability

The spectators were shown their interested in the game. As they were unaware of this game, they were not able to pass any clue to help the player.

Interpretability and understanding of players nature and profile

By observing the play, players' nature can be understood. In this case, the player like the game because at every move he faces challenges to perform.

Ability to generate variations

The game offered variation in terms of structural basis. There is also variations in the method of playing the game.

Ability to generate levels in the game (complexity levels)

Yes. There are two different levels offered in the game AkaarNitee viz. Trekking Treasure and Count-n-fun.

Involvement of players during the play?

It is observed that the players were involved in the game from start to end. The opponents were also busy in deciding the next possible moves by doing the calculations. The active player as well as opponent were thinking about their own strategy during the play.

How location and hardware specific is the game?

One children can carry this game easily.

Due to the size the game becomes location specific and should be played in house, open areas and in hall/ room etc.

The game is not suitable to play in during travel.

Is all the hardware essential all the time?

Yes.

Is there a redundancy in elements?

Most of the the elements were used in the game. There were several blocks are left in the elements' pond; which are provided as extra elements.

The writing pad provide doesn't have any function in playing Trekking Treasure.

USER INFORMATION- 2A



Name: **Chandita Rajesh Chavan**

Age: 12 years old

Standard: 7th Division: C Birthdate: 11th Aug 1996

School: Kendriya Vidyalaya IIT Powai, Mumbai.

Home Address:

Room No. 11, Vidya-Niwas, Hill-side

Indian Institute of Technology Bombay, Mumbai.

Contact No. +91 22 25728120

Contact person : Nalini Chavan

Father's Name: Rajesh Chavan

Mother's name: Nalini Chavan

Occupation: Teacher (Drawing) in KV-IIT

Economic condition of family: Middle income group

The user's opinion

About the board-games:

Snakes and Ladders	Played
Ludo	Played
Monopoly	Played
Business	Played
Navavyapar	Not Played -
Lifestyle	Not Played -
Chess	Played -
Puzzle (time activity)	Played -
Tic-Tac-Toe (pencil paper game)	Played
Dots and lines (pencil paper game)	Played
Carrom	Played

Any traditional game Not played

About Akaarnitee:

Chandita showed interest in playing the Akaarnitee again.

She liked the akaarnitee game and enjoyed playing with the both game i.e. Trekking Treasure and Count-n-Fun.

USER INFORMATION- 2B



Name: **Vandita Reddy**

Age: 11 years old

Standard: 6th Division: B Birthdate: 22th Sept 1997

School: Kendriya Vidyalaya IIT Powai, Mumbai.

Home Address:

Room No. 7, Vidya-Niwas, Hill-side

Indian Institute of Technology Bombay, Mumbai.

Contact No. +91 9819018857

Contact person : Nani (Grandma)

Economic condition of family: Middle income group

The users opinion

About the board-games:

Snakes and Ladders	Played
Ludo	Played
Monopoly	Played
Business	Played
Navavyapar	Not Played -
Lifestyle	Not Played -
Chess	Played -
Puzzle (time activity)	Played -
Tic-Tac-Toe (pencil paper game)	Played
Dots and lines (pencil paper game)	Played
Carrom	Played

Any traditional game Not played

About Akaarnitee:

Vandita showed interest in playing the Akaarnitee again.

She liked the akaarnitee game and enjoyed the Trekking Treasure. As she doesn't like to calculate, she had a problem in counting which is necessary to play the Count-n-fun.

CHAPTER-V

USER FEEDBACK -3 FOR PLAY AND LEARN KIT

(AKAARNITEE- A STRATEGY BASED EDUCATIONAL GAME)

USER FEEDBACK- 3

Date of test: 15th Jan 2008

Details of participants:

Nitin	7 th standard	12 years old
&		
Deepak	6 th standard	11 years old

For the detail information of the users please refer to user information-3A & 3B.

Place where the feedback is taken:

VCPD Studio,
Industrial Design Centre (IDC)
Indian Institute of Technology Bombay, Mumbai.

Conducted by:

Sarang Kusale

To document and analyse the process the following techniques were used:

- Observation
- Notes
- Photography
- Videography
- Discussion with user

PLAYING TREKKING TREASURE



Image 5.01 :Nitin & Deepak were playing the game, Akaarnitee

Introduction

Nitin and Deepak are friends and staying in same area. They play together. The feedback of AkaarNitee, was taken in VCPD Studio, IDC, IITB.

Nitin have already played this game before. And this time he bought his friend, Deepak along with him to play this game.

As he was already familiar with game, he explained the game instructions to Deepak. They had decided to play Trekking Treasure first. Nitin arranged the game board, and was telling Deepak about the magical powers of the object. He was much fascinated by the magical powers of the game.

It took 3 minute to Nitin to explain the game instructions.

Playing Trekking Treasure

The game is started by Deepak.

During second turn they faced problem in arranging two Yellow-Prism together. Deepak loose two chance to complete cube, Nitin adviced him and told the game instructions again.

They were seem fascinated whenever they get any Magical object (Point-Block), they were telling the magical powers of that objects loudly, and saying he had these powers now with him. They were adding dramatic comments while playing. They were deeply involved in playing the game.

The first game is completed after 11 minutes.

Deepak was succeeded in releasing 5 magical objects, and Nitin had those of 3. Thus Deepak was the winner of the first game.

PLAYING TREKKING TREASURE AGAIN

They like this game very much. And they want to play this again. So they have quickly arranged the game board. It took 2 minutes to arrange and start new game.

The first four completed cube were made from same kind of Point-Blocks. They did not prefer to combine two different kinds of Coin-blocks with each other.

It is observed that the player has a personal attachment with the magical-objects.

The players were throwing the die on the game board itself.

The game is completed after 18th minute.
It took more than 7 seven minute to complete this game.

Nitin had 5 magical objects with him and Deepak had 3. This way Nitin won this game.

On the provided notepad, they noted the score of previous game and this game along with the name of each magical objects.

PLAYING COUNT-N-FUN

Now they want to play the second game i.e. Count-n-Fun.

As Nitin has already played this game before, he passed a comment that this game is difficult than the Trekking Treasure so Deepak should listen to the instructions carefully.

He explained the game-instructions of Count-n-Fun to Deepak. Nitin had also explained the point system of each Coin-block. But he couldn't explain procedure of counting number of cubic cm. The game-tester gave the four blocks marked with the grid lines on it, to the Deepak and asked him to count the number of smallest cubes made with the help of grid lines.

Nitin and Deepak had explained each other the count of cubes. Deepak faced problem in counting with the cubes and half-cubes, he was helped by the game-tester in the same. Nitin was doing further calculations for next moves. They have spent 12 minutes on this activity.

Nitin explained Deepak about the point-system and fulfilling the respective conditions i.e. matching the total points of cube with that of the corresponding point-block.

They both took writing pad and started writing points of each block. (The game started at 41 minutes)
Deepak got Yellow-prism and planning to place that on board. At this moment Nitin advised to multiply the point by four and place in the place where it matched. Nitin got completed a cube and got 256 points.

As they were throwing die on the board, due to the blocks placed the die sometimes the die stands tilted, so the players were throwing the die again to get exact reading.

Nitin was deciding the moves quickly as he had already calculated for the next required moves.

The strategy of each player was totally dependent upon the logical thinking and supporting calculations.

After some time Nitin have complete a cube having a points 128 and instead of taking the point-block , he took the cube formed from coin-blocks. (time 56:00)

(The game was completed 65mins)

This game took 47 minutes to complete.

Deepak scored 768 points and Nitin scored 480 points. Thus Deepak was the winner of this turn.

SOME IMAGES WHILE PLAYING COUNT-N-FUN



Image 5:02 : Nitin is calculating to decide the next move



Image 5:03 : Deepak is enjoying the game



Image 5:04 : Nitin & Deepak deciding for further moves with help of notepad.



Image 5:05 : Deepak is calculating.

USE OF WRITING PAD
BY NITIN

Nitin
15-1

$$\begin{array}{r} 16 \\ \times 4 \\ \hline 256 \end{array}$$

$$\begin{array}{r} 38 \\ \times 4 \\ \hline 152 \end{array}$$

$$\begin{array}{r} 64 \\ \times 4 \\ \hline 256 \end{array}$$

$$\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$$

$$\begin{array}{r} 48 \\ \times 2 \\ \hline 96 \end{array}$$

$$\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$$

$$\begin{array}{r} 48 \\ \times 2 \\ \hline 96 \end{array}$$

$$\begin{array}{r} 64 \\ + 64 \\ \hline 128 \\ 128 \\ \hline 256 \end{array}$$

$$\begin{array}{r} 96 \\ \times 2 \\ \hline 192 \end{array}$$

$$\begin{array}{r} 16 \\ \times 4 \\ \hline 64 \end{array}$$

$$\begin{array}{r} 12 \\ \times 4 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 192 \\ + 64 \\ \hline 256 \end{array}$$

$$\begin{array}{r} 96 \\ \times 2 \\ \hline 192 \end{array}$$

$$\begin{array}{r} 128 \\ \times 2 \\ \hline 256 \end{array}$$

$$\begin{array}{r} 128 \\ + 96 \\ \hline 224 \end{array}$$

$$\begin{array}{r} 48 \\ \times 2 \\ \hline 96 \end{array}$$

$$\begin{array}{r} 96 \\ \times 2 \\ \hline 192 \end{array}$$

Nitin
15-1

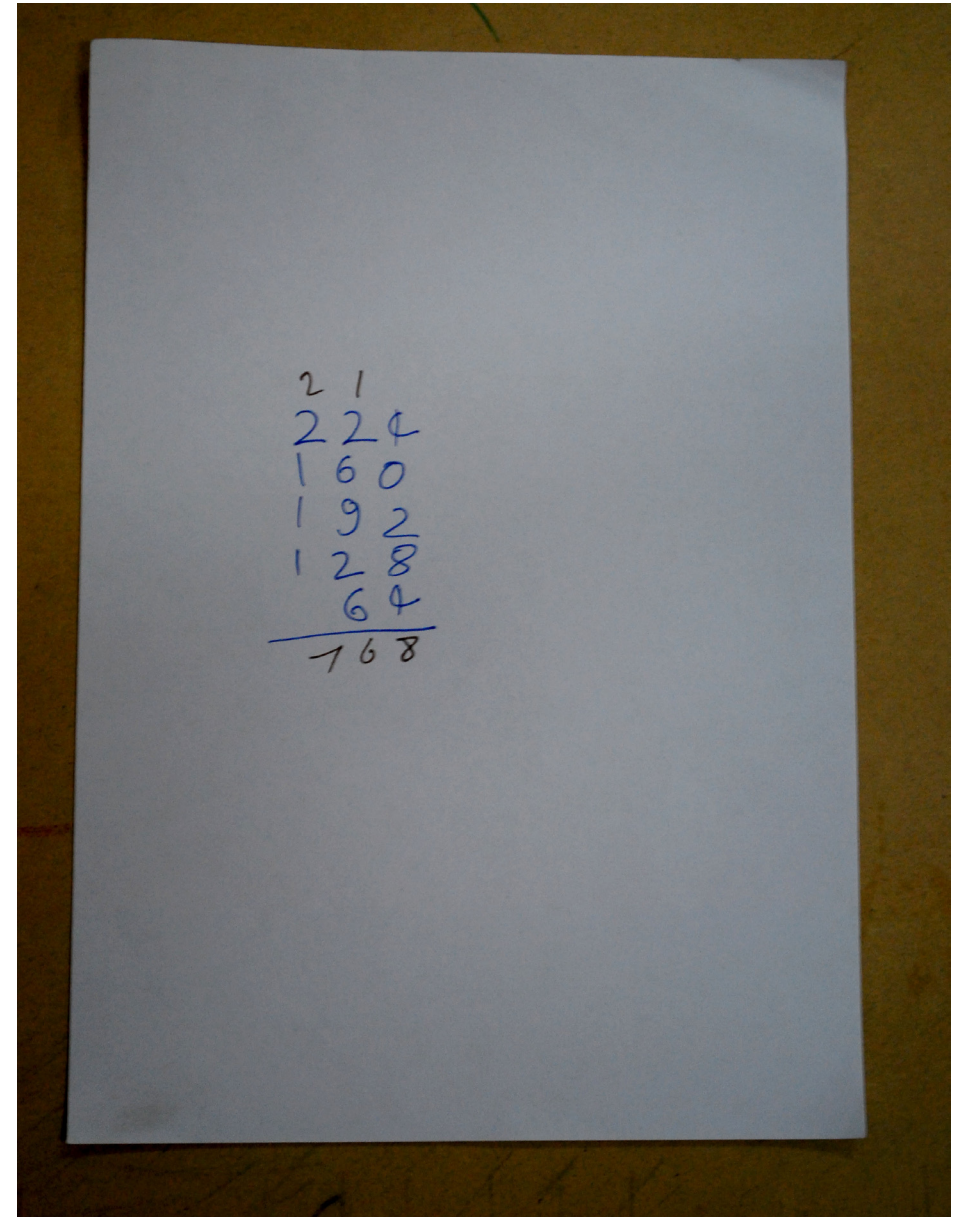
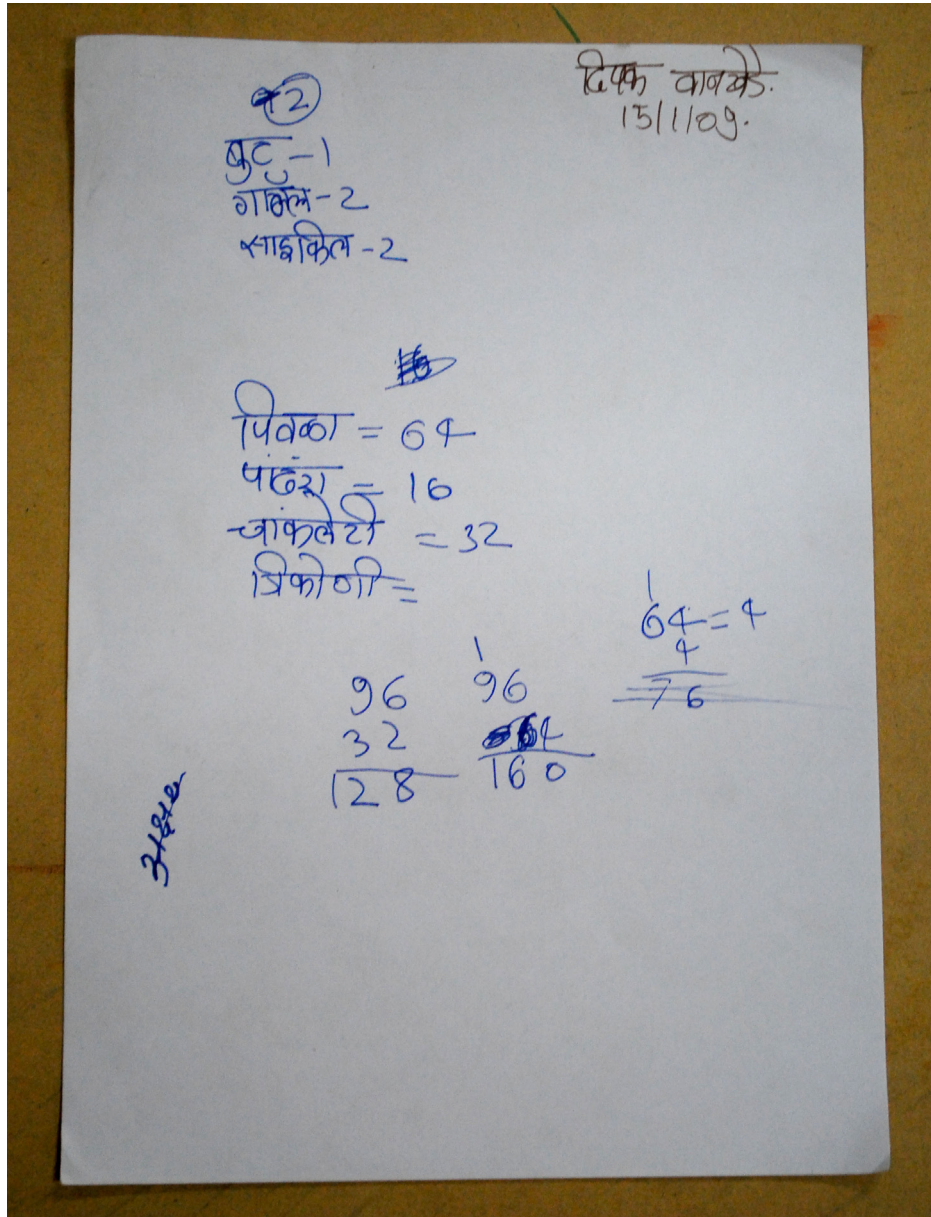
<p>दिपक</p> <p>5</p> <p>3</p>	<p>नितिन</p> <p>3</p> <p>5</p>
-------------------------------	--------------------------------

$$\begin{array}{r} 12 \\ \times 4 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 256 \\ + 96 \\ \hline 352 \end{array}$$

$$\begin{array}{r} 128 \\ \times 2 \\ \hline 256 \end{array}$$

USE OF WRITING PAD
BY DEEPAK



BRIEF FEEDBACK OF GAME FOR TEST-03

Ability to attract repeat play:

Yes

Entertainment/ fun:

The player have enjoyed the both the levels of games

Appeal of fantasy

The story of trekking treasure created fascination and increased the interest of the user

Factor of socialization

The players were sharing their knowledge as they want to win in the game, because they were aware of that a wrong move by opponent affects the further moves.

Play interaction

The players showed a deeper level of interaction between them; as they were deciding the moves by discussion.

Conflict

The opponents decision affects the next players move and he/she needs to decide the strategy accordingly. Therefore the players were co-operating each-other time to time

Education due to game

It offered indirect learning. Player learnt the concept of volume in tacit manner. The counting of the cubes in the coin-blocks offered direct learning of the counting volume of the same. The perception of the volume is also learnt indirectly by experiencing the blocks.

Chance of winning

The chance of winning is dependent upon the understanding of the game and the strategy followed by the player.

Basis of play

Player found the graphics and elements were interesting and attractive.

Players were involved in game all the time. As there is uncertainty maintained by the game, the players kept themselves engaged.

Degree of problem solving challenge

To complete a cube the player had to think about the possible arrangements of the cube. Thus the player's strategy was based on intellectual decisions.

Luck and strategy

The die creates a chance element, and offers the luck factor in the game. The placement of the blocks is totally dependent upon the strategic decisions of the player. Thus there is balance in between luck and strategy factors.

Degree of playfulness

Activity based

Degree of control over choice of board, adjustments, investments

In setting up the game the players can decide the variations as the layout and rules of the game.

Ability to hold interest

It is observed that the game can hold interest for a long time. (about 1 hour 20 minutes)

Fluctuations of tension/ uncertainty in play

The uncertainty is maintained through out the game. In the early game and in mid game the uncertainty is more than that of the end of the game.

Control on pace of game

The control on the pace of the game was totally dependent upon the time taken by the players for making each decision. For some instance the player experienced tough situations, where he took longer time to decide the next move.

Frustration of player

The placement of the Yellow-Prism coin-block in Count-n-Fun game, was experienced as a difficult situation by the player, as there were calculations involved in making a decision. The player was observed under tension in these movements.

Possibility of player becoming an expert

With intellect the player can become expert in this game. The practicing also help in developing the player's performance.

Maintaining score

The provided writing-pad were used to note down the score.

Watchability

The spectators were shown their interested in the game. As they were unaware of this game, they were not able to pass any clue to help the player.

Interpretability and understanding of players nature and profile

By observing the play, players' nature can be understood. In this case, the player like the game because at every move he faces challenges to perform.

Ability to generate variations

The game offered variation in terms of structural basis. There is also variations in the method of playing the game.

Ability to generate levels in the game (complexity levels)

Yes. There are two different levels offered in the game AkaarNitee viz. Trekking Treasure and Count-n-fun.

Involvement of players during the play?

It is observed that the players were involved in the game from start to end. The opponents were also busy in deciding the next possible moves by doing the calculations. The active player as well as opponent were thinking about their own strategy during the play.

How location and hardware specific is the game?

One children can carry this game easily.

Due to the size the game becomes location specific and should be played in house, open areas and in hall/ room etc. The game is not suitable to play in during travel.

Is all the hardware essential all the time?

Yes.

Is there a redundancy in elements?

Most of the the elements were used in the game. There were several blocks are left in the elements' pond; which are provided as extra elements.

USER INFORMATION- 3A



Name: **Nitin Samadhan Dongre**

Standard: 8th Division: B Birthdate: 12th Sept 1995
School: Aman Core Vidyalaya, Pratapanagar, Bhandup, Mumbai.
Class Teacher: Mr. Chaudhari

Home Address:
Room no. 4, Madhane Chawl, Hanuman Tekadi,
Pratap Nagar Road, Bhandup, Mumbai

Contact No. +91 9322470353
Contact person : Vilas-mama, Uncle; stays next door

Father's Name: Samadhan Dongre
Occupation: Labour work in Mahanagar Transport
Income: Rs. 3000/- per month
Mother's Occupation: Cook in a Shakti Mess (IIT campus)
Income: Rs. 1500/- per month + Food allowance
Other family members: One Brother, Studying in 11th Standard

Economic Condition of family: Lower Income Group

The user's opinion

About the board-games:

Snakes and Ladders	Played	Likes very much
Ludo	Played	Likes very much
Monopoly	Not played	-
Business	Not played	-
Navavyapar	Played	Likes
Lifestyle	Not Played	-
Chess	Not Played	-
Puzzle (time activity)	Not Played	-
Tic-Tac-Toe (pencil paper game)	Played	Likes very much
Dots and lines (pencil paper game)	Played	Likes very much
Carrom	Played	Likes very much
Challas (Traditional game)	Played	Doesn't like Thinks it's girl's game.

About Akaarnitee:

Nitin showed interest in playing the Akaarnitee again.
Nitin likes the akaarnitee game, specially the game-1, Trekking Treasure.

Learning from this game:

How to calculate the volume of the block.

USER INFORMATION- 3B



Name: **Deepak Tatyrao Wankhede**

Age: 12 years old

Standard: 6th Division: B Birthdate: 23rd Aug 1996

School: Aman Core Vidyalaya, Pratapanagar, Bhandup, Mumbai.

Class Teacher: Mr. Kendar

Home Address:

Room no. 3, Patole Chawl, Hanuman Tekadi,
Pratap Nagar Road, Bhandup, Mumbai

Contact No. +91 22 25949378

Contact person : Kashibai (shop next door)

Father's Name: Tatyrao Wankhede

Occupation: Watchman (Security Services)

Income: Rs. 4000/- per month

Mother's Occupation: House maid (IIT campus)

Income: Rs. 3500/- per month

Other family members: Three sisters: Sarala (8th Std), Shila (Pursuing D.Ed.) & Sushama (working as receptionist, income:3500/-)

Economic Condition of family: Lower Income Group

The users opinion

About the board-games:

Snakes and Ladders	Played	Likes very much
Ludo	Played	Likes very much
Monopoly	Not played	-
Business	Not played	-
Navavyapar	Played	Likes
Lifestyle	Not Played	-
Chess	Not Played	-
Puzzle (time activity)	Not Played	-
Tic-Tac-Toe (pencil paper game)	Played	Likes very much
Dots and lines (pencil paper game)	Played	Likes very much
Carrom	Played	Likes very much
Challas (Traditional game)	Played	Doesn't like Thinks its girl's game.

Subjects he like:

Marathi, Social science, and Science

About Mathematics he feels:

Maths is difficult subject and for the same he wanted to join a tuition.

About Akaarnitee:

Deepak showed interest in playing the Akaarnitee again.

Nitin like the akaarnitee game, specially the game-1, Trekking Treasure.

Learning from this game:

He related this method of calculating the volume of the block to the area measurement taught in school.

CHAPTER-VI

USER FEEDBACK -4 FOR PLAY AND LEARN KIT

(AKAARNITEE- A STRATEGY BASED EDUCATIONAL GAME)

USER FEEDBACK- 4

Date of test: 04th Feb 2008
Time: 16:00 to 18:30

Details of participants:

Amogh	7 th standard	12 years old
Alok	7 th standard	12 years old
&		
Mahesh	7 th standard	12 years old

For the detail information of the users please refer to user information-4A ,4B & 4C.

Place where the feedback is taken:

Bamboo Studio,
Industrial Design Centre,
Indian Institute of Technology Bombay, Mumbai.

Conducted by:

Sarang Kusale
Ratika Bakshi

To document and analyse the process the following techniques were used:

- Observation
- Notes
- Photography
- Videography
- Discussion with user

READING THE INSTRUCTIONS



image 6:01 : Alok reading the instructions and Amogh and Mahesh arranging the game-board.

Alok started reading the instructions
Mahesh was distracting by the other factors
Amogh was listening to the instructions. Mahesh was making some houses from the game's elements, while listening to the instructions. They have tried to read the instructions in a turn. Amogh didn't want to read the instructions, as he had fear in reading, and worried about people will laugh at him, if he make any mistake in reading. Mahesh also tried reading the instructions but he was reading too slow, and Alok and Amogh had problem in understanding what he was reading. Then again Alok took the lead in reading the game-instructions.
(00:04:50)

Amogh was listening to instructions carefully and arranging the respective magic-objects (point-blocks) on the board. Mahesh joined him.

They faced the coin block with image-side down. Here they were told by game-tester to place them facing the image side up.

They faced problem with followings words/sentences from game-instructions:

Obstacles
Equipped
"Respective cube"

Alok read how to start playing, by throwing the die. Then immediately they tried the throwing die, and desided the turns.

Mahesh had taken initiative to distribute the note-pad and pen to the other players. Game-tester advised them that they don't need this for playing the trekking treasure, they will need those for playing the Count-n-Fun.

(00:14:27)

They don't want to read the further instruction, so they requested the game-tester (Sarang) to read the instructions for them. He explained how to play the game, with the help of printed instructions.

(0016:30)

PLAYING TREKKING TREASURE



image 6:02 : Playing Trekking Treasure



image 6:03 : When Amogh completed a cube

Playing Trekking Treasure:

They started playing.

Mahesh had problem in condition of completing the cube and gaining the respective point-block.

Game-tester helped him to understand the rules.

Amogh had problem in understanding 'completed cube'. Game-tester demonstrated them some cubes formed with the coin-blocks. They understood quickly when they had seen those cube. They also made some other cubes immediately.

(00:19:00)

They continued playing, and placing the gained coin-blocks from die throws.

Mahesh completed the first cube and got the 'Magical Spectacles', Amogh excitedly told the magical powers of it.

(00:22:00)

Alok was excited whenever he gets green dot, as it gives freedom to choose any of four coin-blocks. He was also observed as restless, and gets distracted with the other factors from surrounding.

Mahesh was very happy as he released two magical objects and he was ahead in the game at that time. (00:23:55)

They were curious about the recording-camera.

Alok and Amogh also seemed excited with the magical objects, which they had released.

(00:25:00)

They involved in the game.

The game was completed (00:30:04)

It took 13:30 min to complete.

Mahesh has revealed 4 magic-objects and Alok and Amogh both had 2 of them.

PLAYING COUNT-N-FUN

(00:32:00)

Now they want to play the second game i.e. Count-n-Fun.

Alok want to take initiative in reading instructions, but Amogh and Mahesh don't want to read the instructions.

'...agar galat huwa to sab logg hasenge.'-Amogh

Amogh had fear in reading, he was thinking that people will laugh at him if he make any mistake in reading. So he didn't want to read.

(00:34:50)

They found this very similar to first game.

Amogh and Mahesh were not listening to Alok, so they requested a Ratika (Spectator, age 26 years) to explain the instructions. Ratika took the charge and started reading for them.

(00:37:00)

As per the instructions, they were told to count the numbers of smallest cube (1 cubic cm) in each of the coin block.

Amogh was counting same cubes again and again, as he kept on rotating the coin-block.

He was made realize the mistake. And he counted again and this time he counted 32 numbers of small cube in brown-brick.

(00:38:13)

"Mai area find karata hoon sabka"- Alok

Then she helped three of them in calculating the number of smaller cubes.

(00:40:00)

"I'll count this base in to height"- Alok

Alok and Mahesh were distracted several times.

(00:43:00)

They counted the 16 number of smaller cubes in each coin-block.

Amogh had counted first. Alok was interested in counting the cubes.

They also found that, the coin-blocks look so different but all blocks have 16 smaller cubes.

They needed help in how to count the cubes in each coin-block.

(00:47:00)

They were gossiping in between.

She explained the points of the coin-blocks. All three of them responding positively, and calculating the total points of each coin-block.

Mahesh tried to write the points on the coin-block itself. Then they were told to use their writing pad to note these things.

They wrote the points of each block, they also draw the respective figure and wrote name of each block.

(00:57:00)

They were again gossiping and teasing each other.

They took a break of 10 minutes. (to call at home, attending natural calls, drinking water etc.)



image 6:04 : Ratika explaining the instructions.

Ratika explained game instructions. And they started to play count-n-fun.

(01:14:00)

For each move they are thinking and referring their own notepad to decide the placement of coin-block.

Amogh took 2 and half minute to decide a move, during this time Alok was observed impatient and Mahesh was thinking.

(01:19:00)

Alok took help from Ratika to understand how to place the coin-block. Alok disliked the calculations. But he was trying hard to calculate and decide move.

(01:25:00)

They were doing calculations secretly, and they didn't want to share with others.

Alok got bored, as he didn't have interest in calculations. So Mahesh was teasing him.

(01:28:30)

“Amogh, tuzhe kaise aata hai yaar..”- Alok

“arey ye game unpadh gawaaron ke liye nahi hai”- Mahesh

(01:30:00)

They were treated with some sweets.

They continued play while enjoying the sweets.

As Alok was taking more time to decide the move, Mahesh and Amogh was taking this chance to tease him.

Amogh was much serious in playing the game.

Alok and Amogh were fighting with each other.

Alok skipped a turn as he took a break to wash his hands.

(01:38:00)

Whenever Amogh got the points Alok was frustrated.

(01:40:00)

Now they all playing seriously, as they wanted to get more points. They were throwing hints and comments when others are deciding moves.

Mahesh completed a cube and got the respective points. Alok reacted with frustration.

Mahesh was excited and dancing as he got the points.

They all were serious in playing the game.

Mahesh was teasing Alok, as Alok has problem in counting and also he was not performing well in game. Mahesh mentioned about the Alok's 'Repeat Classes' in school .

(01:51:20)

Amogh was busy in calculations and deciding the next possible moves.

(01:52:00)

Alok completed a cube, but was not able to match the points. So those coin-blocks were deposited back to the elements pond.

Mahesh advised him, “play with logic, as the game's name is count and fun, you need to count then you'll have fun”

Amogh suggested the name should be 'brain- tumour'. Mahesh suggested another name- 'Demaak ki waat'.

(01:56:30)

Alok was distracting by gossiping, Mahesh advised to play the game seriously.

Alok was assisting Mahesh in move. He was telling that to complete the cube there was need of two types of coin-block. He was expecting the help form Amogh, but Amogh didn't want to answer though he knew how to play. He was playing with strategy.

(02:00:04)

They were involved in the game, and playing seriously for next 8 minutes. After that they were distracted with other factors. They were getting bored and they want to end the game at this moment, instead of going for completing the game.

They want to go home and worried about the time.

(02:08:33)

They calculated their points, Amogh has scored highest, and Alok has lowest score.

Now they have arranged the elements and packed the game.

(02:11:00)

Amogh was the winner of second game.

Background:

After school they had tuition for all subjects. After the tuition they came in IDC to play the game. This session took more than two hours. As these children were worried about the time, they need to go early. So they concluded the game in between. They are observed restless. Alok was having problems in counting, but he tried to concentrate on game, and sometimes get frustrated.

Amogh had understood the game and performing well in game. He used to do calculations for next possible moves. These calculations were kept as secrets, and he was reluctant to share those with others. He had his own strategy.

Mahesh was silent, and involved in a game deeply. At some time whenever he collected points, he used to dance in pleasure. He also threw some comments and hints to others and tried to help them.

SOME IMAGES WHILE PLAYING COUNT-N-FUN



image 6:05 : Excitement during game



image 6:07 : A serious thinking.



image 6:06 : Amogh doing calculations for next moves.



image 6:08 : Deciding moves

USE OF WRITING PAD
BY AMOGH

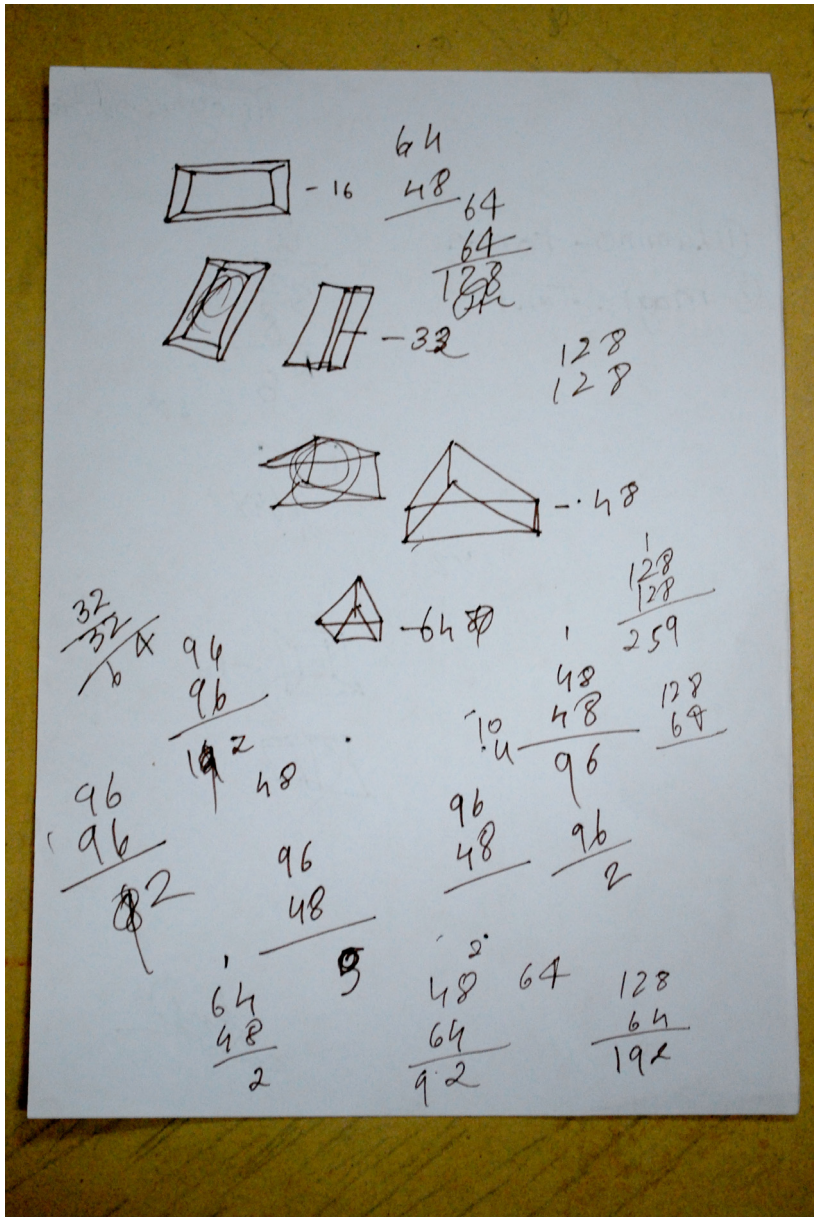


image 6:09 : Notes by Amogh

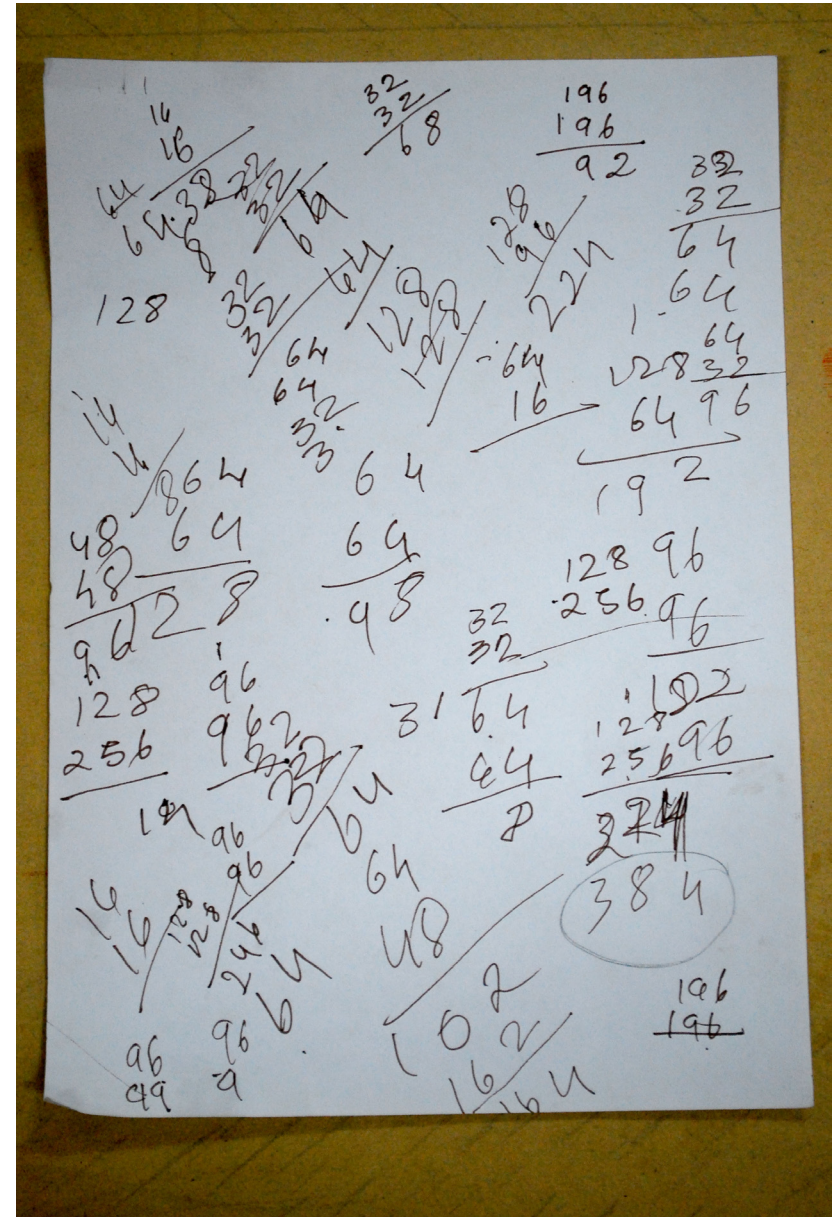


image 6:10 : Notes by Amogh

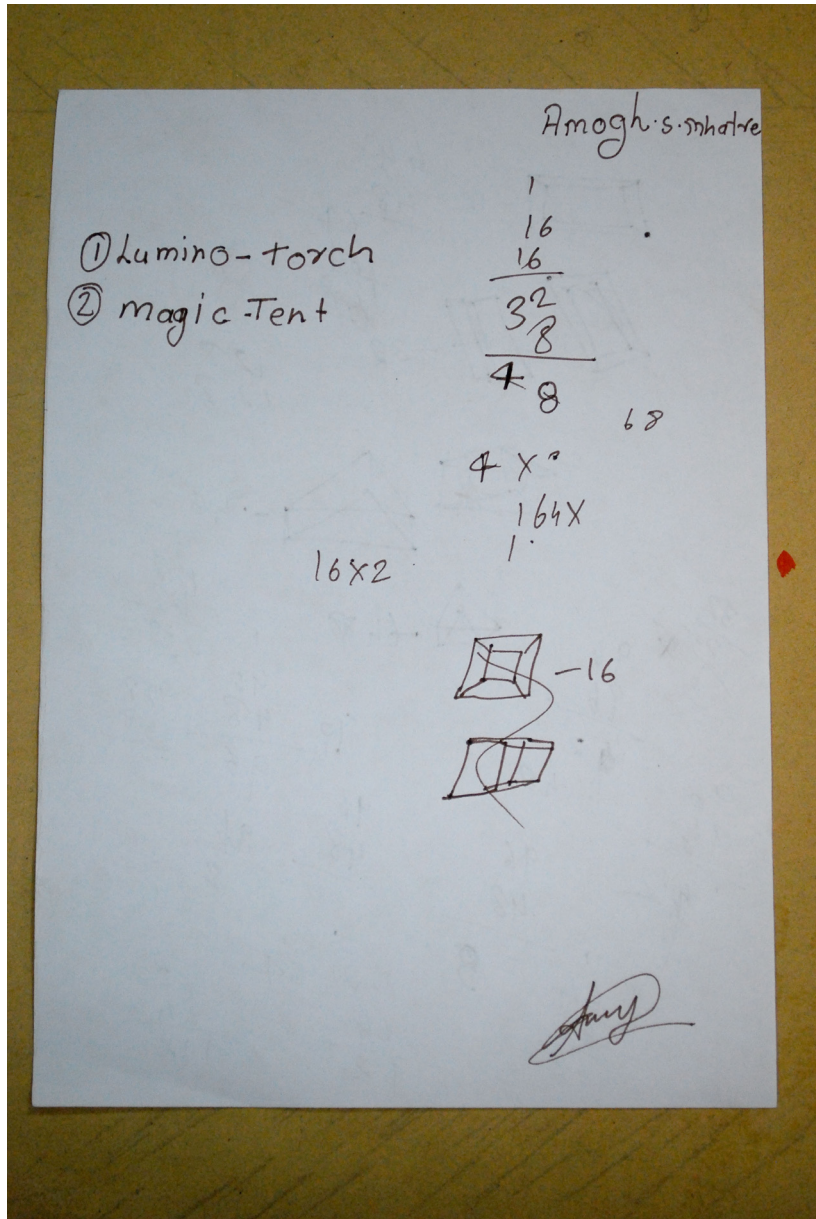


image 6:11 : Notes by Amogh

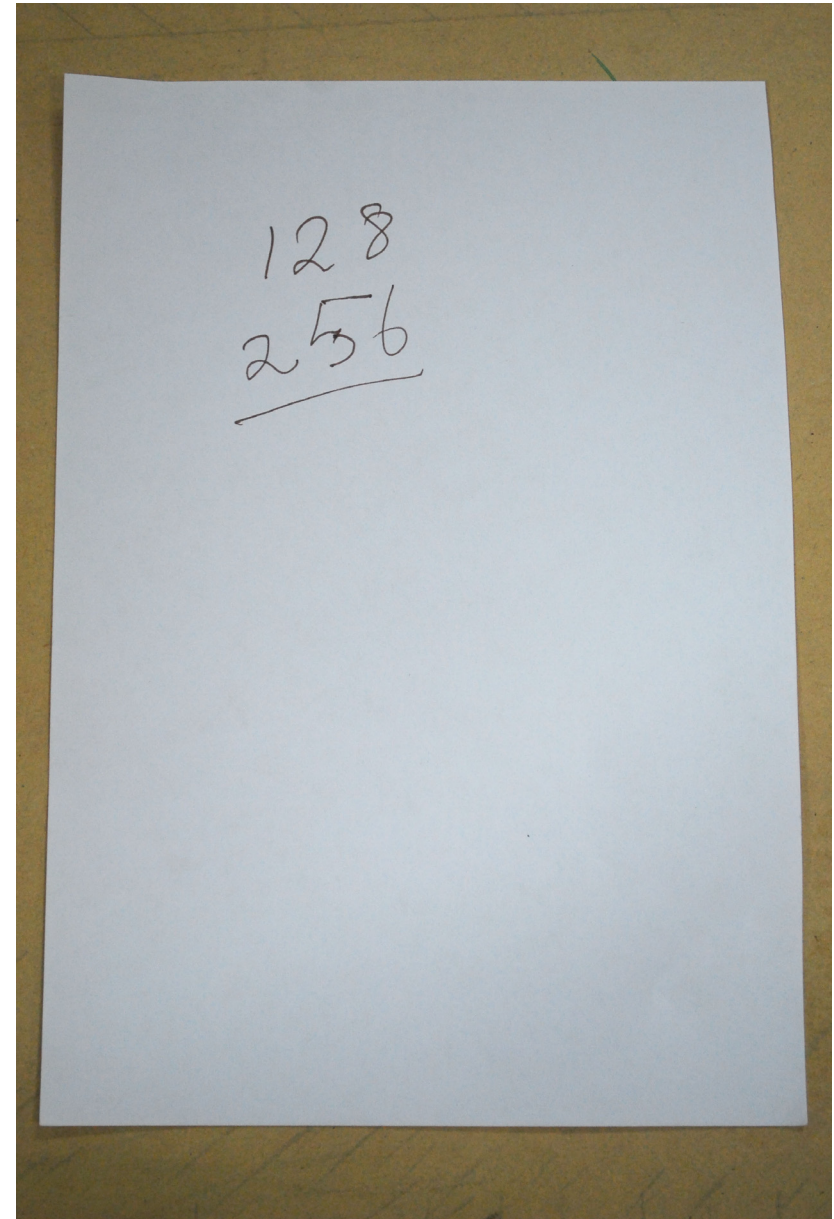


image 6:12 : Notes by Amogh

USE OF WRITING PAD
BY ALOK

Handwritten mathematical work on a writing pad:

- Division: $16 \overline{)128}$
- Multiplication: $\begin{array}{r} 16 \\ \times 24 \\ \hline \end{array}$
- Multiplication: $\begin{array}{r} 16 \\ + 16 \\ \hline 32 \end{array}$
- Subtraction: $\begin{array}{r} 224 \\ - 80 \\ \hline 144 \end{array}$
- Division: $\begin{array}{r} 72 \\ 144 \end{array}$
- Multiplication: $\begin{array}{r} 16 \quad 32 \\ \times 4 \\ \hline 128 \end{array}$
- Division: $\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$
- Multiplication: $\begin{array}{r} 16 \\ \times 4 \\ \hline 64 \end{array}$
- Multiplication: $\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$
- Multiplication: $\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$
- Multiplication: $\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$
- Multiplication: $\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$

image 6:13 : Notes by Alok

Handwritten mathematical work on a writing pad:

NAME - ALOK
BINOCULAR
Vehicle Camela

- Multiplication: $\begin{array}{r} 2 \\ 16 \\ \times 24 \\ \hline 64 \end{array}$
- Multiplication: $\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$
- Multiplication: $4 \times 8 = 32$
- Multiplication: $4 \times 8 = 32$
- Multiplication: $4 \times \frac{1}{2} = 2 + 6 = 8 \times 2 = 16$
- Multiplication: $\begin{array}{r} 64 \\ \times 2 \\ \hline 128 \end{array}$
- Multiplication: $\begin{array}{r} 2 \times 6 = 16 \\ \times 2 \\ \hline 32 \end{array}$
- Multiplication: $\begin{array}{r} 16 \\ 3 \times 3 \\ \hline 48 \end{array}$
- Multiplication: $\begin{array}{r} 16 \\ \times 4 \\ \hline 64 \end{array}$
- Multiplication: $\begin{array}{r} 64 \\ \times 2 \\ \hline 128 \end{array}$
- Diagram: A 3D rectangular prism with a smaller one inside, labeled $= 16$.
- Diagram: A triangle, labeled $= 48$.
- Diagram: A 3D rectangular prism, labeled $= 32$.
- Diagram: A triangle, labeled $= 64$.

image 6:14 : Notes by Alok

USE OF WRITING PAD
BY MAHESH

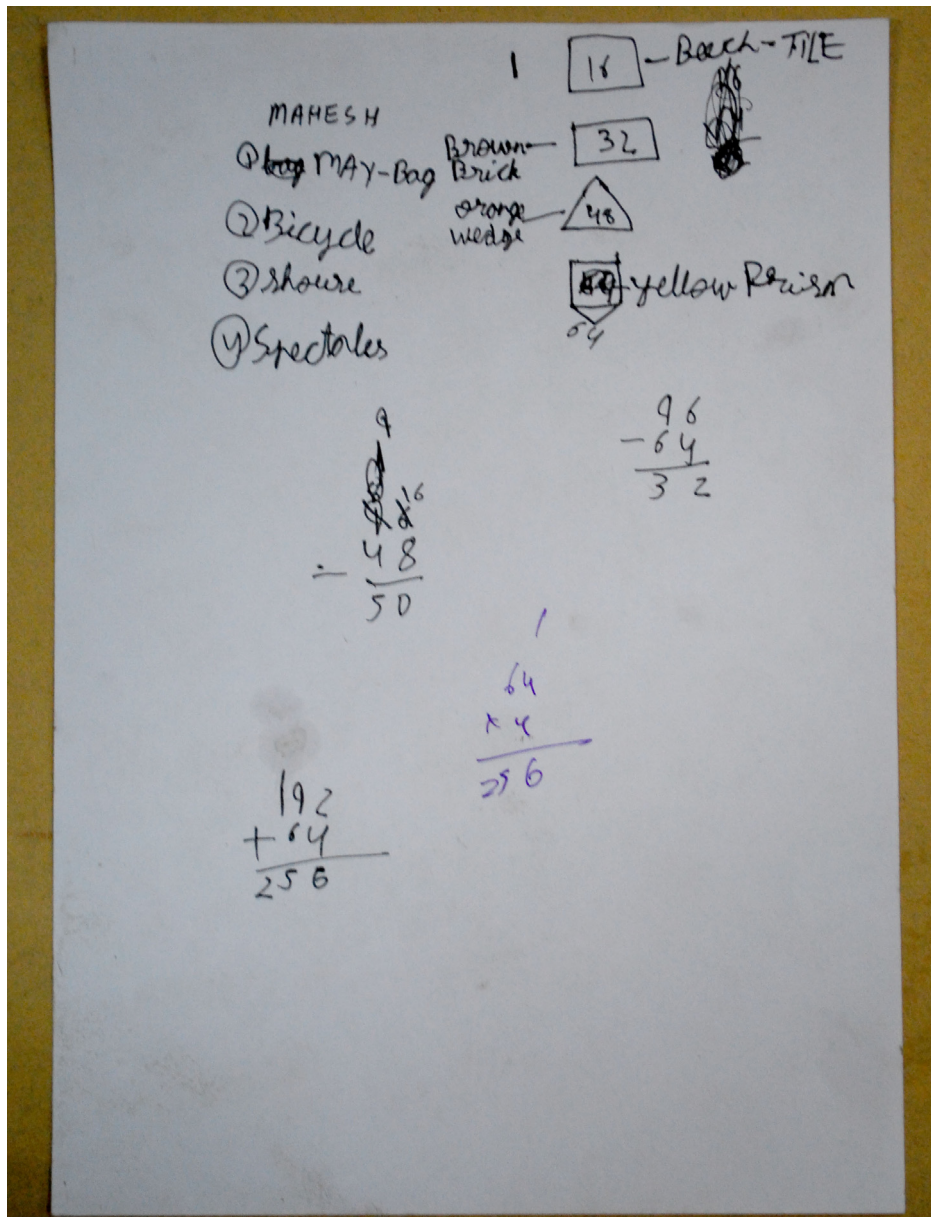


image 6:15 : Notes by Mahesh

BRIEF FEEDBACK OF GAME FOR TEST-04

Ability to attract repeat play:
Yes

Entertainment/ fun:
The player have first the level of games. But Alok got bored in second level.

Appeal of fantasy
The story of trekking treasure created fascination and increased the interest of the user.

Factor of socialization
Sometimes the players were sharing their knowledge and giving hints to opponents, because they were aware of that a wrong move by opponenent affects the further moves.

Play interaction
The players showed a deeper level of interaction between them; as they were deciding the moves by discussion.

Conflict
The opponents decision affects the next players move and he/she needs to decide the strategy accordingly. Therefore the players were co-operating each-other time to time, and throwing some hints to opponents.

Education due to game
It offered indirect learning. Player learnt the concept of volume in tacit manner. The counting of the cubes in the coin-blocks offered direct learning of the counting volume of the same. The perception of the volume is also learnt indirectly by experiencing the blocks.

Chance of winning
The chance of winning is dependent upon the understanding of the game and the strategy followed by the player.

Basis of play
Player found the graphics and elements were interesting and attractive. Players were involved in game all the time. As there is uncertainty maintained by the game, the players kept themselves engaged but as it extended up to 2 hours they were in hurry to finish the game.

Degree of problem solving challenge
To complete a cube the player had to think about the possible arrangements of the cube. Thus the player's strategy was based on intellectual decisions.

Luck and strategy
The die creates a chance element, and offers the luck factor in the game. The placement of the blocks is totally dependent upon the strategric decisions of the player. Thus there is balance in between luck and strategy factors.

Degree of playfulness
Activity based

Degree of control over choice of board, adjustments, investments
In setting up the game the players can decide the variations as the layout and rules of the game.

Ability to hold interst
It is observed that the game can hold interest for a long time. (up to 2 hours). As the children were worried about time, they want to go home early so tried to conclude teh game early.

Fluctuations of tension/ uncertainty in play

The uncertainty is maintained through out the game. In the early game and in mid game the uncertainty is more than that of the end of the game.

Control on pace of game

The control on the pace of the game was totally dependent upon the time taken by the players for making each decision. For some instance the player experienced tough situations, where he took longer time to decide the next move. During this period the opponents engage themselves in calculating their next moves, or they feel bored.

Frustration of player

As there were calculations involved in making a decision. The player was observed under tension in these movements.

Possibility of player becoming an expert

With intellect the player can become expert in this game. The practicing also help in developing the player's performance.

Maintaining score

The provided writing-pad were used to note down the score.

Watchability

The spectactors were shown their interested in the game.

Interpretability and understanding of players nature and profile:

By observing the play, players' nature can be understood.

Ability to generate variations

The game offered variation in terms of structural basis. There is also variations in the method of playing the game.

Ability to generate levels in the game (complexity levels)

Yes. There are two different levels offered in the game AkaarNitee viz. Trekking Treasure and Count-n-fun.

Involvement of players during the play?

It is observed that the players were involved in the game from start to end. The opponents were also busy in deciding the next possible moves by doing the calculations. The active player as well as opponent were thinking about their own strategy during the play.

How location and hardware specific is the game?

One children can carry this game easily.

Due to the size the game becomes location specific and should be played in house, open areas and in hall/ room etc. The game is not suitable to play in during travel.

Is all the hardware essential all the time?

Yes.

Is there a redundancy in elements?

Most of the the elements were used in the game. There were several blocks are left in the elements' pond; which are provided as extra elements.

USER INFORMATION- 4A



Name: **Amogh Shailendra Mhatre**
Age: 12 years old

Standard: 7th Division: B Birthdate: 18th Sept 1996
School: Kendriya Vidyalaya, IIT Powai, Mumbai

Home Address:
Room No. 218, Bibe 18, Hill side
Indian Institute of Technology Bombay, Mumbai.

Contact No. +91 22 2578198

Father's Name: Shailendra Mhatre
Occupation: Working in garage
Mother's Name: Tejashri
Occupation: Nurse in Nair Hospital, Byculla
Income: Rs. 1500/- per month + Food allowance

Economic Condition of family: Medium Income Group

The users opinion

About the board-games:

Snakes and Ladders	Played	Likes
Ludo	Played	Dislikes
Monopoly	Played	Neutral
Business	Not played	-
Navavyapar	Not played	Likes
Lifestyle	Not Played	-
Chess	Played	Dislike
Carrom	Played	Likes very much
Any Traditional game)	Not played	-

How do he get these games?

- He tells parents that he want so and so game.

how does he choose games?

- He want to try new games

About Akaarnitee:

Amogh showed interst in playing the Akaarnitee again.

He enjoyed both the games in the akaarnitee game.

USER INFORMATION- 4B



Name: **Alok Markandeya Giri**
Age: 12 years old

Standard: 7th Division: B Birthdate: 24th Aug 1996
School: Kendriya Vidyalaya, IIT Powai, Mumbai

Home Address:
H2, Building No. 3, Room No. 18, Lake side,
Indian Institute of Technology Bombay, Mumbai.

Contact No. +91 22 25728268

Father's Name: Markandeya Giri
Occupation: Watchman (Security services)
Mother's Name: Indu Giri

Economic Condition of family: Medium Income Group

The user's opinion

About the board-games:

Snakes and Ladders	Played	Likes
Ludo	Played	Don't like at all
Monopoly	Played	Don't like at all
Business	Not played	-
Navavyapar	Not played	-
Lifestyle	Not Played	-
Chess	Played	Likes very much
Carrom	Played	Likes very much
Any Traditional game	Not played	-

How do he get these games?

- He buys from the market with parents

How does he choose games?

- He heard about the game from his friends; so he wants to buy.

About Akaarnitee:

Alok is showed interest in playing the Akaarnitee again.

But he was not comfortable with logical calculation needed for each move in Count-n-Fun.

USER INFORMATION- 4C



Name: **Mahesh S. Gupta**
Age: 12 years old

Standard: 7th Division: D Birthdate: 8th Oct 1996
School: Kendriya Vidyalaya, IIT Powai, Mumbai

Home Address:
H1, Building No. 3, Room No. 25, Lake side,
Indian Institute of Technology Bombay, Mumbai.

Contact No. +91 22 25728063

Father's Name: A.G. Gupta
Occupation: Superintendent Engineer (IIT)
Mother's Name: Nirmala Gupta
Occupation: Housewife

Economic Condition of family: Medium Income Group

The users opinion

About the board-games:

Snakes and Ladders	Played	Likes
Ludo	Played	Likes
Monopoly	Played	Likes very much
Business	Not played	-
Navavyapar	Not played	-
Lifestyle	Not Played	-
Chess	Played	Neutral
Carrom	Played	Likes very much
Any Traditional game	Not played	-

How do he get these games?
- Parents buy for him

how does he choose games?
- He heard about the game from his friends; so he want to buy.

About Akaarnitee:

Mahesh have showed interst in playing the Akaarnitee again.
He enjoyed both the games in the akaarnitee game. He is the winner of Trekking Treasure.

CHAPTER-VII

TEACHERS' FEEDBACK FOR PLAY AND LEARN KIT

(AKAARNITEE- A STRATEGY BASED EDUCATIONAL GAME)



A discussion held with teachers of Sahyadri School, which provided following points:

The game is appreciated for encouraging the tacit learning methodology.

The teachers were looking at it from the point of teaching aid, which is not the designer's aim. So they are observed bit confused to accept the learning without the classroom environment

The concept of a game-library is discussed by Prof. Rao
This game-library will be there for each school, where such educational games are there. and students can play these games in their free time.

CHAPTER-VIII

PROPOSAL OF A BOOKLET ON VOLOUME MEASURES

CONCEPT OF BOOKLET ON VOLUME MEASURES

The volume measures are used since a long time in day today activities. The ancients were using wooden containers to measure the grains. Later on these system gets standardies and accepted and developed by the respective communities.

The current International Standard for measuring volume cubic meter. one cubic meter is 1000 litre. and this unit 'litre' we are using in our daily activities.

As the game is about the Volume and conceptual learning a Booklet consisting of the information of these volume measure will definitely provide an enriching experinece and also boost the interest of the children in learning the volume as a part of their daily life.

The information and deatils of volume measures are collected by visiting museums and also from day to day life.

APPLICATIONS OF THE VOLUME MEASURES FROM DAILY LIFE



image 8:01 : Volume measure from a hawker



image 8:02 : Volume measure from a petrol pump



image 8:03 : Volume measure from a roadside hawker



image 8:04 : Laboratory volume measures

SEER : VOLUME MEASURE



SEER

a volume measurement unit
from early 20th century
Maharashtra

These are in cylindrical form having diameter to height ratio approximately one. The material of used to manufacture is brass or copper and sometimes even in combination.

Note:

This measures are still used by some of the shopkeepers and hawkers.



1/2 SEER

inside diameter = 8.5 cm
height = 8.5 cm



1/4 SEER

inside diameter = 6.5 cm
height = 6.5 cm



1/8 SEER

inside diameter = 5.4 cm
height = 5.2 cm



1/32 SEER

found at a hawker in Mumbai

WOODEN MEASURE (GOA)



Wooden Measures

a volume measurement unit
from 19th century, Goa

These are in cylindrical form and are made from wood. There is a metal handle provided in long the diameter of the opening for easy handling.

These measures are used for measuring the grain.

(The larger measure's capacity is five times of the smaller measure.)

Courtesy: Raja Dinakar Kelakar Museum, Pune



Wooden Measure (Small)

inside diameter = 12.5 cm
height = 9 cm

Approximate volume
= 1104 cubic cm



Wooden Measure (Big)

inside diameter = 24.5 cm
height = 11.5 cm

Approximate volume = 5422 cubic cm

WOODEN MEASURE (GUJRATH)



Wooden Measures

a volume measurement unit
from 19th century, Gujrath

These measures are generally used to measure grains, thus these measures become an essential part of the trading system. These are having a cylindrical form, made from wood and are decorated in a rather simple yet elegant style. Sometimes there is a metal handle provided in the long diameter of the opening for easy handling.

Courtesy: Raja Dinakar Kelakar Museum, Pune



Wooden Measure-A

inside diameter = 7 cm
height = 7 cm
Approximate volume
= 269 cubic cm



Wooden Measure-B

inside diameter = 8.5 cm
height = 10 cm
Approximate volume
= 568 cubic cm



Wooden Measure-C

inside diameter = 10.5 cm
height = 12 cm
Approximate volume
= 1082 cubic cm



Wooden Measure-D

inside diameter = 13.7 cm
height = 14.5 cm
Approximate volume
= 2137 cubic cm

WOODEN MEASURE (GUJRATH)



Grain Measures

a volume measurement unit from 20th century, Maharashtra

These measures are dumbbell shaped and are generally made from wood or iron. As these were used to measure grains, they got importance in the daily life and also become an essential part of some rituals.

Each type of these measure has a specific name viz. Nithawe, Athawe, Aathuli and Payali.

(Payali is not shown in photographs)

$$1 \text{ Payali} = 2 \times \text{Aathuli} = 4 \times \text{Athawe} = 8 \times \text{Nithawe}$$

Courtesy:

Raja Dinakar Kelakar Museum, Pune
Tribal Museum, Pune



Nithawe

Top diameter= 5.5 cm
Centre diameter
= 2.75 cm
Height = 7 cm



Athawe

Top diameter= 9.5 cm
Centre diameter
= 4.75 cm
Height = 12cm



Athuli

Top diameter= 15 cm
Centre diameter
= 7.5 cm
Height = 23.5 cm



Scenario of the grain measuring

CHAPTER-IX

CONCLUSION

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The testing of the game AkaarNitee is done with the school going children from 11 to 13 years old. The children participated in this test are from various backgrounds. Some of them are from English medium school, and some are from Marathi medium school. Their family's economical background is also different. Irrespective of these factors the game is succeeded in the test. In each case, the game is able to hold the interest of the players more than a hour and half.

The environment of the testing of the game is also varied, including playing in home and in institution place. Certain factors are observed which affected the performance of children, including the disturbances in environment, parent's and/or spectator's suggestions and the new attractive elements present in the new environment.

The other factor observed is that some students seems to be overloaded with the routine cycle of school, tuitions, sports activities and TV etc. All these activities are time bound which makes children restless and impatient.

Documentations played a very important role in analyzing the time and activity relationship. Videography, Observation, Notes, Photography, Discussion with children before and after the test and Group Discussion among the members who conducted the test are the various ways with which the feedback is analyzed.

The selling price of the game is determined by talking with teachers, parents and children. Almost all parents were shown positive response and they are ready to buy this game in the rage of 800 to 1000 Rs.

OVERALL FEEDBACK OF GAME

Ability to attract repeat play:

Yes, very much.

Entertainment/ fun:

All players have enjoyed the both the levels of games. The second level of game i.e. Count-n-fun is found by some player as difficult one, at the start of this game.

Appeal of fantasy

The story of trekking treasure created fascination and increased the interest of the user.

Factor of socialization

The players were sharing their knowledge and generally passes hints to the opponent. As they were aware of that a wrong move by opponent affects the further moves, so they observes the moves and decides their strategy accordingly.

Play interaction

The players showed a deeper level of interaction between them; as they were deciding the moves by discussion. They were also observed keeping some secretes, resulted in strategic play.

Conflict

The opponents decision affects the next players move and one needs to decide the strategy accordingly. Therefore the players were co-operating each-other time to time

Education due to game

It offered indirect learning. Player learnt the concept of volume in tacit manner. The counting of the cubes in the coin-blocks offered direct learning of the counting volume of the same. The perception of the volume is also learnt indirectly by experiencing the blocks.

Chance of winning

The chance of winning is dependent upon the understanding of the game and the strategy followed by the player.

Basis of play

Player found the graphics and elements were interesting and attractive. Players were involved in game all the time. As there is suspense maintained in the game, the players kept themselves engaged.

Degree of problem solving challenge

To complete a cube the player had to think about the possible arrangements of the cube. Thus the player's strategy was based on intellectual decisions.

Luck and strategy

The die creates a chance element, and offers the luck factor in the game. The placement of the blocks is totally dependent upon the strategic decisions of the player. Thus there is balance in between luck and strategy factors.

Degree of playfulness

Activity based

Degree of control over choice of board, adjustments, investments

In setting up the game the players can decide the variations as the layout and rules of the game.

Ability to hold interest

It is observed that the game can hold interest for a long time, generally on an average the children are engaged with game more than 1 hour and 20 minutes.

Fluctuations of tension/ uncertainty in play

The uncertainty is maintained through out the game. In the early game and in mid game the uncertainty is more than that of the end of the game.

Control on pace of game

The control on the pace of the game was totally dependent upon the time taken by the players for making each decision. For some instance the player experienced tough situations, where he took longer time to decide the next move.

Frustration of player

The placement of the Yellow-Prism coin-block in Count-n-Fun game, was experienced as a difficult situation by the player, as there were calculations involved in making a decision. The player was observed under tension in these movements.

Possibility of player becoming an expert

With intellect the player can become expert in this game. The practicing also help in developing the player's performance.

Maintaining score

The provided writing-pad were used to note down the score and it is also used to decide the strategy of play.

Watchability

The spectators were shown their interested in the game. As they were unaware of this game, they were not able to pass any clue to help the player.

Interpretability and understanding of players nature and profile

By observing the play, players' nature can be understood. In this case, the player like the game because at every move he faces challenges to perform.

Ability to generate variations

The game offered variation in terms of structural basis. There is also variations in the method of playing the game.

Ability to generate levels in the game (complexity levels)

Yes. There are two different levels offered in the game AkaarNitee viz. Trekking Treasure and Count-n-fun.

Involvement of players during the play?

It is observed that the players were involved in the game from start to end. The opponents were also busy in deciding the next possible moves by doing the calculations. The active player as well as opponent were thinking about their own strategy during the play.

How location and hardware specific is the game?

One children can carry this game easily.

Due to the size the game becomes location specific and should be played in house, open areas and in hall/ room etc.

The game is not suitable to play in during travel.

Is all the hardware essential all the time?

Yes.

Is there a redundancy in elements?

Most of the the elements were used in the game. There were several blocks are left in the elements' pond; which are provided as extra elements.

The writing pad provide doesn't have any function in playing Trekking Treasure.

CHAPTER-X

RECOMMENDATIONS

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Following factors should be taken care before going to conduct a testing of a game.

Understand the kit

Read the reports and instruction sheet of the kit and/or game thoroughly. Understand the each element of the same in detail. Play the game, so that you can understand it deeply.

Prepare a prototype for testing

A prototype is must for the game testing. Decide the number of prototypes required, depending upon the nature and scope of the testing requirements.

Participant details:

The target user, their age-group, required number for conducting a test, background of the user etc. are the details of the participants. These details should be decided before passing the message to the contact person. The variation in these factors may affect the performance of the proposed test.

Contact and communication:

Prefer to contact children first. Do give them exact idea of the test. If you have contacted parents then told them briefly about the nature of test and background of it. Parents are also to be requested to carry out their work while the children are playing. The description of planned test and the basic requirement should be communicated briefly and precisely to get desired condition.

How to contact children:

It is advised to contact children directly. Visit the places such as playground, common hall, where children generally spend their time. Ask the children to pass the information to their friends. You can also contact through schools, where you need to take a permission from certain authority and teachers to spread the words in

the children. Once you receive the contact of the interested student, contact the parents/ children and take their preferences of time and locations.

Preparations before test:

Recharge the batteries of your camera, audio-recorder and video-recorder. Keeping a set of extra batteries for backup, is always better. Empty the memory cards. Ensure that you have enough space for storage. Keeping backup memory card is advisable. Check and setup the functions of each equipment before the test.

A form for test details:

Prepare a form to collect the information of the participants and test details. Be specific and particular while preparing the form. Include all the necessary details. Carry these form with you when you are conducting a test.

Rewards and Gifts:

Buy some chocolates, you can give these chocolates to participant as gifts and also the interest can be created by offering rewards for the game winner.

Arrangements at the venue:

If you are conducting a test longer than a hour, then arrange for drinking water and if possible refreshments also. Sitting arrangements for participants. Fix up the tripod for video-recording at the desired location.

Documentation:

As a research requirement this is one of the major parameter. A video recording is a preferred tool to analyses the details and behavior of the user.

To understand the thinking process of the user, the game-tester should talk with them and find out their way of perception and way of thinking and analyzing.

Assist them by asking some questions and try to figure out what is there in their mind? What they are trying to make with the elements of kit? How they are making it? Are the constraints of the kit creates problems?

With the help of the data-forms collect the information from participants about their interests, background and other necessary personal information.

The observations made during test should be written and after the test these points should be discussed.

Environment:

To get the best results of the test the environment should be as neutral as possible. Conducting the feedback in the user's place is preferred option as it is comfortable environment for the user.

The environment may contain some factors which causes distractions to the user. Try to minimise these distracting factors and create a controlled environment.

The presence of parent may create tension in children, sometimes this tension may affect the participants' performance. Parents want to improve the performance of the kid, therefore they starts instructing the children.

REFERENCES

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Sources for information of volume measures:

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Bajirao Road, Pune

Tribal Museum,
28 Queens Garden, near the railway station. Pune

&
Chor-bazaar, Mangalwar Peth, Pune
(For the SEER measures)