



# Designing for Children

- With focus on 'Play + Learn'

## Toys and Tales for joyful learning

Experiencing design process

Surabhi Khanna, National Institute of Design (Haryana), khanna.surabhi@gmail.com

**Abstract:** *The best thing a child can do with a toy is break it, the next best thing is to make it; even better is to create it.*

Toys and tales are symbiotic in nature. Toys enhance skills, tales enable communication; together they form an amalgamation of creativity and a special design process. In 2011, I started conducting workshops on toy and game design. The idea was to experience joyful learning and design process. The participants were educators, special need therapists, child development specialists and children of various age groups. These design workshops are also related to research and play heritage. The power of making and then playing is immense. The medium of toy design facilitates the ability to create and express. The workshops included learning about material, concept development, communication, science principle. This helps integrate design, art, technology and social input, which seems possible especially with toy and game design. The paper explores design process through toy design. This is explained through 1) Toys and Tales development and 2) Design process. Some experiences of design workshops and courses with various groups of school teachers & children, university faculty & students will be shared. The experience of the design and innovation process through workshops on toy and game will also be shared.

**Key words:** *Design Research, Play Heritage, Toy & Game, Play Memories, Heuristic approach*

## 1. Introduction

Indigenous toys and games have a certain mystery and potential for playful learning. This paper explores how does making a toy and creating a tale with it also helps one experience the design process. While conducting workshops, I was curious to know why the participants found the activity of creating ideas and making toys enriching. Two things were observed - one was the idea of connecting toys and tales together and the other that there seemed to be a design process, which facilitates a heuristic approach. An indigenous dynamic toy is demonstrated and explained to participants.

The following table shows workshops conducted for various groups of participants.

No.	Group	Number of workshops	Average number of participants	Total participants	Countries
1.	Children	22	32	713	India, Colombia
2.	Teachers, Teacher-trainees	33	54	881	India, Colombia, Denmark
3.	Design students	6	26	153	India, Denmark, Thailand
	<b>Total</b>	<b>61</b>	<b>29</b>	<b>1747</b>	<b>India, Colombia, Denmark, Thailand</b>

Table 1. Workshop groups and number of participants from 2011 to 2018

This paper explores the topics 1) toys and tales and 2) experiencing design process, by explaining two of the toys in detail - String-pulled Puppet (toys and tales) and *Khel Manthan* (experiencing design process).

## 2. The medium of Toys and Tales

Indigenous toys or folk toys seemed to be a good starting point to understand toys and the stories associated with them. It is interesting to note that many toys were short-lived and yet the play value is timeless.

Dynamic folk toys are by nature short-lived, mostly due to the use of eco-friendly material. This in a way is positive as children engage with the toy as long as it interests them. (Khanna, Wolf, Ravishankar and Sundram, 2018). *The best thing a child can do with a toy is to break it, the next best thing is to make it; even better is to create it.* The process fuels natural curiosity, develops fine motor skills, develops peer relationship and creative thinking. Both the product and process provides a heuristic approach.

Toys and tales are symbiotic in nature. Toys enhance skills, tales enable communication; together they form an amalgamation of creativity and a special design process. This is explained further through the example of the String-pulled Puppet and *Khel Manthan - Churning Learning*.

## 2.1 Learning through toys and tales: String-pulled Puppet

Puppets - both static and dynamic have been an important part of play for children. The String-pulled puppet is a dynamic toy, which traditionally existed in many parts of India (Figure.1a). There used to be themes related to mythology, animal forms, daily lives, popular culture. We simplified the mechanism so that participants in the workshops could easily make a structure. (Figure.1b). The String-pulled Puppet has been explored as a teaching-learning material, with participants - teachers, teacher-trainees and students of pedagogy. With students of architecture, this was explored in the design of an installation. In this case, the outcomes gave us a chance to understand how we can use the same basic structure to create, a tale, a teaching-learning tool, and a large scale installation. These special sessions give an insight of how the heritage-based toys are still relevant for play and learning today.

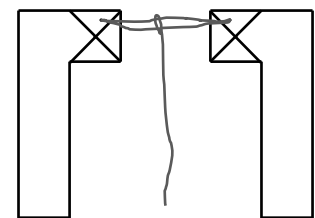
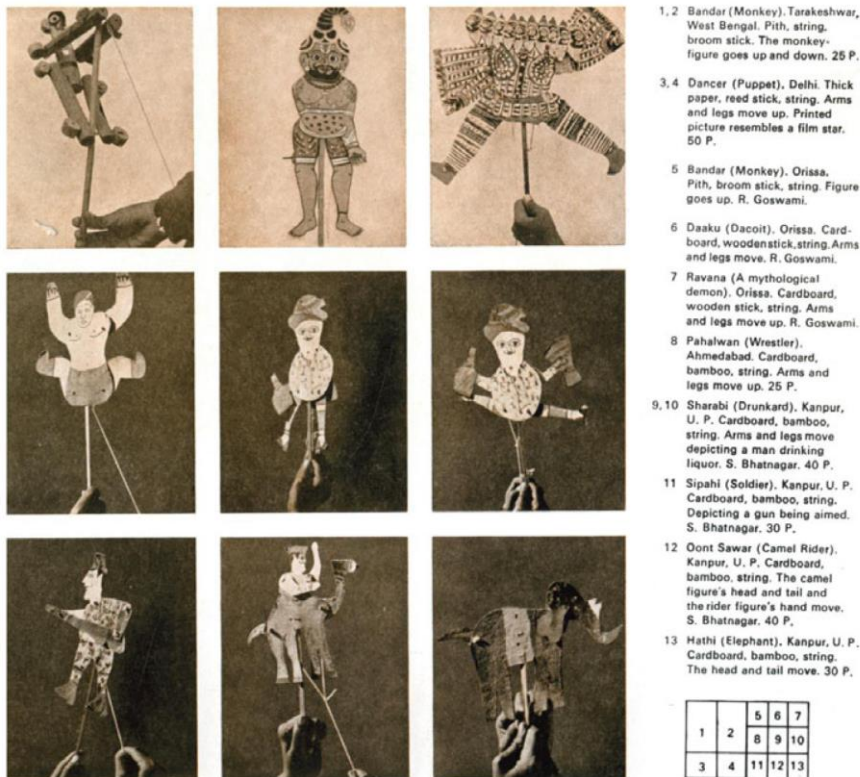


Figure.1a Various explorations made by crafts persons, documented in *Dynamic Folk Toys* (1983); Figure.1b Construction of string pulled puppet simplified into geometrical shapes and pivot points, developed at Surabhi Khanna design studio

**Workshop for Students:** The workshop with 20-odd students of Sardar Patel Vidyalaya School, New Delhi, was interesting. Students of grades 6 and 7 students explored many tales and forms (Figure. 2). Basic structure with link mechanism using two L-shape paper cut-outs was made. But while tying the knots, the children needed help as they were not used to working with needle and thread. It was realized that such simple skills are important to make toys. The children made a variety of stories. *“My superman will fight*

*with your iron-man”, a ghost with red hair, a cow telling her story, an angel who makes scientific toys; many stories created by children were shared, narrated, and laughed.*



Figure.2 Workshop on Design & science toys with String-pulled Puppets: for grades 6 and 7 of students of Sardar Patel Vidyalaya, New Delhi, 2014

**Workshop for Teachers:** For teachers of school JB centre, Faizabad, Uttar Pradesh, a Design & Education workshop on “Toys & Tales for Joyful Learning” was conducted. The workshop introduced toy design as a tool for holistic & experiential learning. *How a crow puts pebbles in a pot of water to raise the water level to drink, two girls moving pigtails and singing a poem, how a frog likes to be on grass and make ‘tar-tar-tar’ sound and birds protecting their eggs;* were some of the concepts made by the teachers, connecting toy and tale.

The 40-odd students of pedagogy of B.El.Ed program, 1<sup>st</sup> year, Teachers’ Training college, Mata Sundri college, Delhi university (DU), presented their stories together by connecting all their characters to one story. Forms like *cow, peacock, eight-legged spider, barking dogs, a hunter hunting for the tiger who is protected by its friends monkey, peacock-peahen, rabbit, “a chicken who got up early every morning and woke up a dog by his sound. So the dog decided to scare chicken. But chicken was so big that the dog got scared. The dog decided to bark from the back ‘bow-wow’ and scare the chicken away”.* Many such spontaneous stories were created by the participants, by understanding the movement and nature of the toy (Figure.3).

**Workshop for Design students:** “To study a heritage based toy and design it in a different context” was the brief given to the students of 4th year of architecture at School of Planning and Architecture (SPA), New Delhi. A headless life-size puppet with a string pulled mechanism was created by a group. The player’s head become a part of the installation. *“Hulkfie”, as the installation was called since it was inspired by Hulk’s form,* became a very popular installation at the student festival. Students took selfies with the installation. The leg paddle moved the arms of the puppet, making the installation dynamic (Figure.4).

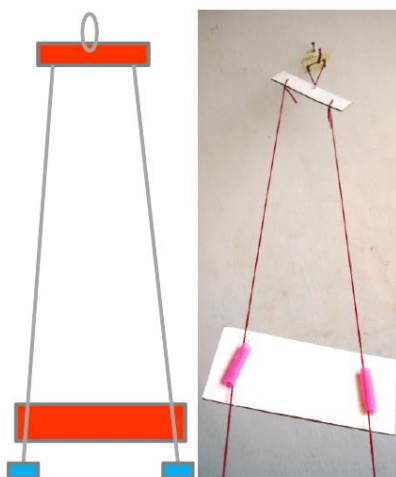


Figure.3 Toys and Tales with String-pulled Puppets: at teacher's training course, Mata Sundri College, Delhi University, 2015



Figure.4 Workshop-Elective outcome with students of school of planning and architecture (SPA), New Delhi, India, 2014

## 2.2 One to Many: *Khel Manthan* - Churning-Learning



*Khel Manthan* (Churning-Learning) is designed, taking inspiration from an indigenous toy 'Climbing Toy'. It is a Story-Teller and Story-Maker. The mechanism involves two components, connected by pieces of string, where one climbs towards the other. Through workshops as well as user testing, many ideas and stories were explored.

Figure.5 Simplified structure of Climbing Toy



Teacher running towards school since late

Child pulling out bucket from well in village to see how mother does it

Train going towards tunnel

Figure.6 Explorations by participants (trainers of teachers) at CARE, India in Lucknow, 2012

**Workshop with children:** The workshop at Karmmarg in 2017 with children of various age groups was interesting. Children in a group of four made the structure and created stories like *butterfly going towards flower for nectar, moon going to star, plane flying in clouds, monkey eating mango.*

**Workshop with teachers:** A workshop was conducted for teachers at CARE, India. Two cardboard pieces, strong plastic straw or paper pipes and string, to make a basic structure, were provided (Figure.5) to help participants understand the material and mechanism for the toy to function, the force and the action of climbing. Various stories like *teacher running towards school, train going towards tunnel, octopus going to eat a fish, children going towards their home;* were few concepts (Figure.6). The outcome fell in the categories of identity (name), how does an animal live (home), what does one want to eat (food) and various actions (story) (Figure.7b). This was developed in a play product, with self-help groups, using hand-crafted skills of embroidery and applique where the concept of making multiple stories was explored, using interchangeable characters (Figure.8). The information cards (Figure.9) have graphics as well as poems and stories, some of which are inspired from the ones documented during user interaction (Figure.10).

**Workshop with design students:** At the International Play Conference in 2017, in Bengaluru, participants made many interesting stories like *a boy, whose pants are moving towards him, so that he could wear them.* This had the potential to be developed into an interactive installation.

User Study of selected Concept : workshop for Teachers' Trainers of CARE, India

I had the opportunity to do a special session with Care, India staff of Teachers' Trainers at Lucknow. There were 45 participants from four states (Gujarat, Uttar Pradesh, Delhi, Bihar) who were also senior Teachers' Trainers. This was a grand opportunity to get their feedback by a special workshop of three hours period.

The following is the feedback from teachers' trainers:

- They saw this system of toys as an opening for introducing learning by play and also the economical side of production and marketing of this concept.
- Play idea was found interesting and can be used as educational material.
- The participants felt that the toy concept

can be experimented with different themes, story-telling sessions, explaining facts, giving situations to deal with, as well as playful learning.

- Participatory approach is the central feature of this toy concept.
- Multiple concepts are possible. Instead of one lower cardboard base, many more can be placed with more characters stuck on them.
- Race between two students to create competitive spirit.
- Idea of interchanging characters in the same structure thereby giving more possibilities in one product itself.

Relating & associating things & concepts

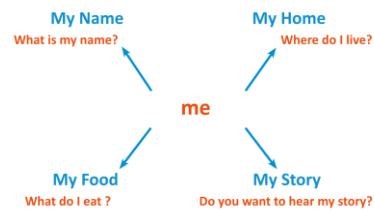


Figure.7a user experience reflections from the workshop; Figure.7b Categories

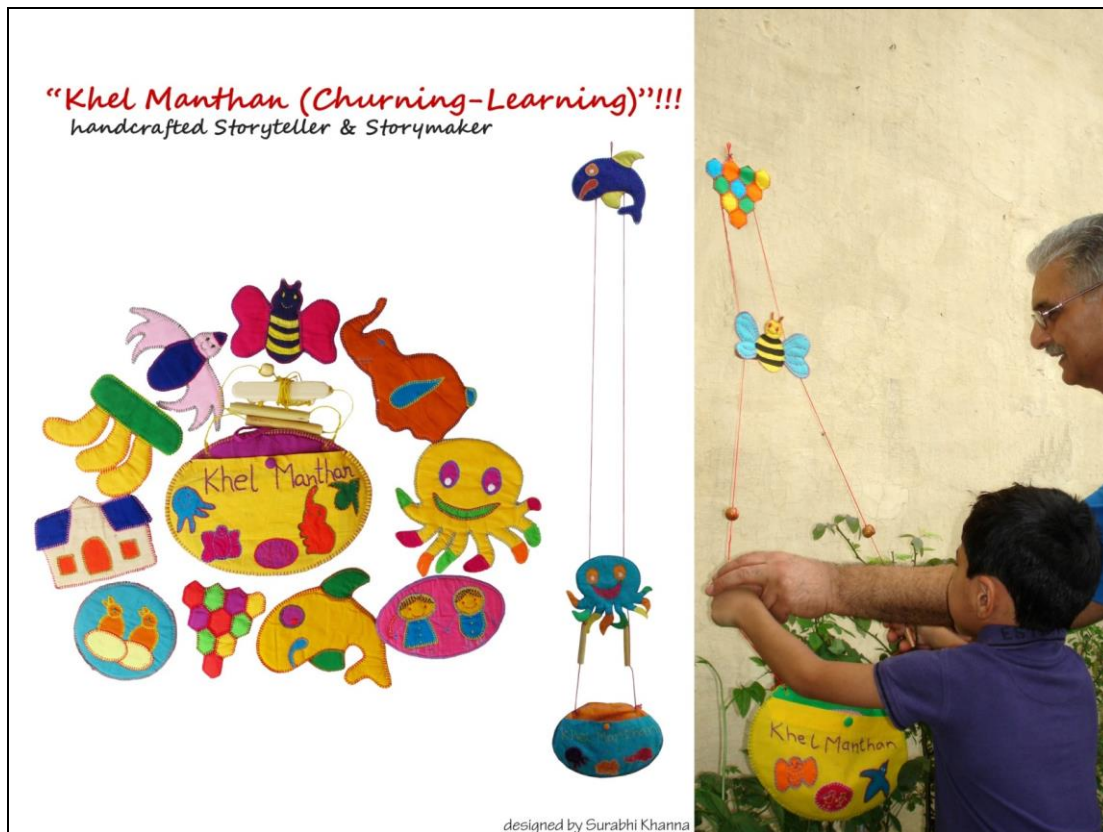


Figure.8 Khel Manthan - Churning Learning, handcrafted story teller and story maker. Concept of interchangeable characters and multiple story-telling explored. The packaging with graphics, introduces the concept of tidiness and organization in keeping back materials and objects in a logical way.

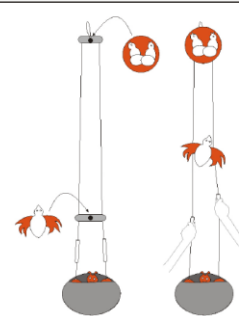
 <p><b>Khel Manthan</b></p> <p>Khel Manthan is a design development project to produce play products using local skills and modern design methods. Here we bring you an indigenous play kit for young children, which will help develop motor skills, impart education as well as fun. We hope that adults will equally enjoy, helping and playing with young children through this play product. The play product and packaging are integrated creatively for to introduce the practice of orderliness and organization.</p> <p><b>How to Play</b></p> <p>Parents, guardians and teachers could hold or hang the loop. Children can choose the characters from the bag which they want to stick on the wooden pieces. Pull the handles alternately till the character reaches up. Climb up, soar high and create your own stories, poems, incidents while playing. A few examples are given at the back. Wish u a Happy Climb!!!</p>	<p>'My Home' play kit of Khel Manthan</p> <p><b>Honeybee and its Hive</b></p> <p>Honeybee took honey, to go to its hive, On the way saw many bees, One, two, three, four, five!!!</p> <p><b>Children and their Home</b></p> <p>Teacher delicately asks child : Where do you go from school? Home? Creche ? Do you like being at home? What do you do? Do you have sister, brother or friends? Who do you like the most at home?</p> <p><b>चिड़िया के बच्चे</b></p> <p>एक चिड़िया के बच्चे को घर से नीकले कुछ प्यार इन्हें से चिड़िया को जाने जलुवर से चिड़िया को आएं, चूरा चूरा के घर को आएं, मसुरी को एक बाज बनाएं देख किया हमने जग मारा अपना घर है हमको परारा !!!</p> <p><b>How to Pack</b></p> <p>Place both the wooden pieces together such that their velcro pieces stick together. Now wind the string around and put them along with the handles in the middle portion of the bag. Put the characters in the side pockets. Place the loop around the button to close the bag and put it away till your next play mood.</p> <p>Price : xxx/-</p>
--	--

Figure.9 an example of characters and story, depicted with graphics and poems



Figure.10 Interaction with students and teachers at *Saraswati Shishu Mandir*, Bhopal gave an interesting user feedback. The group started singing poems and rhymes on the spot. So children who were not directly playing with the play product were also involved in playing.

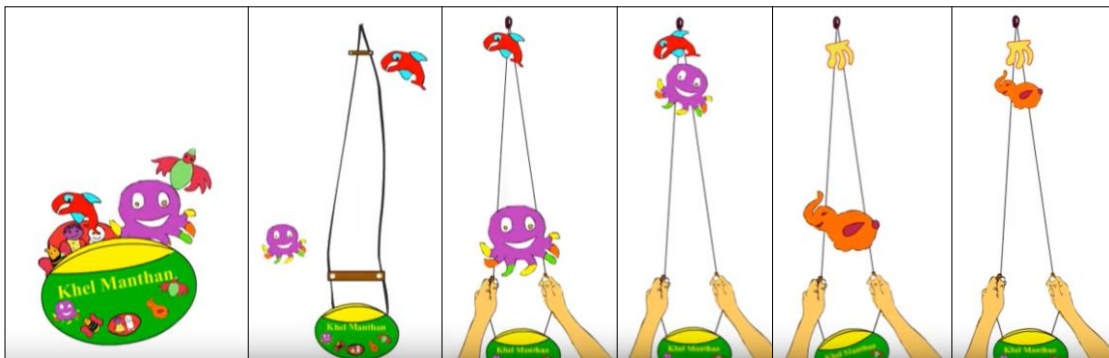


Figure.11 Graphical representation of how *Khel-Manthan* works stepwise of “My Food”. The reference is taken from the animation on you-tube. The first three pictures show the octopus climbing towards the fish, the fourth and fifth picture show another story of an elephant going to eat bananas.

### 3. Experiencing Design Process

The two play products explained in the paper can be used to experience design process. This is useful in understanding the interface of mind, material and media. These can be explored with a variety of user groups through workshops. Both have play and learning value and provide a heuristic approach. Table.2 explains the details.

No.	Name of Toy	Material	Design Element	Principle of Science and technology	Learning Value (of playing with the toy and/or making it in the workshops) in terms of design process
1.	String-pulled Puppet	Paper, needle, thread, ice-cream stick, glue	Symmetry, movement	Link-mechanism	Concept development, understanding structure, story making and telling, creative process
2.	<i>Khel Manthan</i> (Churning-Learning) - Story maker and story teller	Cardboard, straw, string, paper, glue	Movement, proportion	Linear motion, friction	Individual and group play, creativity in multiple story making and telling

Table 2. Analysis of the toys explained in the paper



The design process enhances the abilities of the participants through the following skills, explained in Table.3:

- **Creating (toy and stories)**
- **Communicating (playing and telling story)**
- **Co-relating (toy and learning)**

No.	Name of Toy	Participants	Experiencing design process		
			Creating (toys and tales)	Communicating (playing and telling stories)	Co-relating (toy and learning)
1.	String-pulled Puppet	Teachers, teacher-trainees	Stories ending with learning or moral or characters. <i>How a crow puts pebbles in a pot of water to raise the water level to drink, two girls moving pigtails and singing a poem.</i>	Spontaneously presented their stories together by connecting all their characters to one story. Some sang poems and songs together while moving the puppets.	Could be used as a teaching-learning material. Various themes from the subjects taught, could be made.
		Students	Stories related to popular characters. <i>“My superman will fight with your iron-man”, a ghost with red hair, a cow telling her story, an angel who makes scientific toys.</i>	The children made a variety of stories. They individually expressed their forms and stories, sometimes connecting with each other.	The movement of the puppet, fascinated the students. Understanding the pivot points. Learning the skill of tying knots.
		Design students	<i>“Hulkfie”, as the installation was called since it was inspired by Hulk’s form,</i> became a very popular installation at the student festival.	Designed for a different context. Changed the scale.	Students were thrilled to be able to make a toy into an installation. They learnt about material knowledge, weight and force and how to make an interactive installation.
2.	<i>Khel Manthan</i> (Churning-Learning) - Story maker and story teller	Teachers, teacher-trainees	Making connecting stories. Themes like photosynthesis were made.	Team work. Playing with another. Many stories form the same two characters- whether octopus eats fish or fish eats octopus.	Learning about relationship between two characters.

		Children	Created forms which they liked and connected them with their own tales.	They made it into a competition. Whose churning-learning climbs faster, if placed at the same height. Interesting as some had shorter strings, some had longer.	Hand-mind co-ordination for pulling and making the character climb. Creative thinking as connecting two characters in various ways. Material knowledge, how does the slant in the component, help the character climb.
		Design students	<i>A boy, whose pants are moving towards him, so that he could wear them.</i> This had the potential to be developed into an interactive installation.	Creating in a different context and making interactive play.	Understanding the scale and material.

Table 3. Analysis of the toys through the design process

#### 4. Reflections and indications

The reflections from the workshops have given the following insights:

- I. **Heuristic approach:** The workshops provide a heuristic approach to learning.
- II. **Play and Learning:** There is potential of play and learning in indigenous toys.
- III. **One to Many:** The idea of One to Many is effective as there is an opportunity to create many ideas, starting from one idea.
- IV. **Interaction:** Interaction between participants prevails. Adult-child interaction is also retained, which again is a connection between generations.
- V. **Creativity:** Children get deeply involved in the process of creating and playing.
- VI. **Innovate heritage through stories:** One of the best ways to innovate heritage is through documentation of play ideas and making it in today's context through stories and themes.
- VII. **Reduce consumerism:** The action of toy making helps reduce consumerism and promote the value of making and creating products.
- VIII. **Cultural resource:** The design explorations also are cultural resource for learning.

## References

Gupta, A (1993) Toy Treasures, Eklavya, Bhopal, India, [www.arvindguptatoys.com](http://www.arvindguptatoys.com)

K.B. (2013, October 6) : Toying with ideas. The Hindu.

Available at <http://www.thehindu.com/features/metroplus/toying-with-ideas/article5207102.ece>  
[Accessed June 29, 2014]

Khanna, S. (1983) Dynamic Folk Toys. Indian Toys based on the application of simple principles of science & technology, The Development Commissioner for Handicrafts, New Delhi, India, [www.sudarshankhanna.com](http://www.sudarshankhanna.com)

Khanna, S. (1992) Joy of Making Indian Toys, National Book Trust, New Delhi, India, [www.sudarshankhanna.com](http://www.sudarshankhanna.com)

Khanna, S., Wolf G. and Ravishankar A. (1999) Toys and Tales with everyday materials, Tara Publishing, Chennai, India.

Khanna S., Wolf G., Ravishankar A. and Sundram P. (2018) Toys and Play with everyday materials, Tara Publishing, Chennai, India.

Khanna, S. (2012) 'Khel Manthan'-Design & Development of playful, innovative products with local skills & co-operation (master's project), National Institute of Design, Ahmedabad, India. [www.khannasurabhi.wordpress.com](http://www.khannasurabhi.wordpress.com), <https://khannasurabhi.files.wordpress.com/2018/04/surabhi-khannafinal-nid-project-khel-manthan.pdf>