

“THE TUMMY-O-SAURAS”

Submitted in partial fulfillment of the requirements

in the degree of

Masters Of Design

by

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Industrial Design Centre

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THE TUMMY-O-SAURAS

AN INTERACTIVE STORY BY VIDUSHI YADAV

GUIDED BY PROF. PHANI TETALI

ROLL NUMBER: 126340012

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IDC, IIT BOMBAY

Approval Sheet

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The Animation Project III entitled "The Tummy-O-Saurus", by Vidushi Yadav (Roll number, 126340012) is approved, in partial fulfilment of requirements of the Masters of Design degree in Animation in Industrial Design Centre of Indian Institute of Technology, Bombay.



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Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/ data/ fact/ source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Date.....

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~Dedicated to my parents~

Acknowledgement

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Abstract

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The project brief given to me was to come up with an interactive animation movie for four to six years of children which helps them in developing their visual discrimination, eye coordination, motor skills, memory, imagination, concentration, observation, conversational skills, classification etc. The project brief provided to me was open to explorations. I was expected to write a story for children from four to six years of age, which helps them in developing in many ways. Since the desired outcome was not in the form of a fixed product, it excited me. The outcome in the form of purpose was clear to me. Children have always been interesting and adorable for me, thus working on this project was very interesting to me.

An interactive animated story was completely a new concept for me. I had to start from scratch. Though I knew what words like visual discrimination and eye coordination mean literally, but I was totally unaware of what they actually mean in a much deeper way, and how are they connected with a child's development. One thing I knew from very beginning that I have to do an extensive research for the project. Primary research involved user study by meeting children, observing them, also talking to parents, teachers and principals. In secondary research I read about children and their development theories and patterns as it is a much researched topic, and there is a lot of good literature available of some very famous educationalists. After Research I started working on concepts and the story.

Slowly I started reading interactive story as a game designed to teach good values to the kid while he can enjoy and learn, as an alternative to traditional ways of teaching. It took me a little while to get accustomed to the thinking. It was most difficult to think like a child, my earlier concept were either too easy or too difficult for a child. As my presence in the project matured, I got more comfortable in understanding and achieving what was required. I came up with several stories out of which I narrowed down two stories and finally I decided on one story based on the maturity of the idea.

Project

COSMIC

The Centre of Social Media Innovations for Communities (COSMIC) is a collaborative initiative among three centres of excellence – two from Singapore, NUS (National University of Singapore) and NTU (Nanyang Technological University), and one from India, IITB (Indian Institute of Technology Bombay, Mumbai). The centre is supported by the multi-agency Interactive Digital Media Programme Office (IDMPO) hosted by the Media Development Authority (MDA) of Singapore. COSMIC aims to empower communities through social media innovations. The research envisions new interaction paradigms and information technology scenarios, which have the potentials to empower the next billion users - focusing on the common man in its everyday pursuit of activities in the 21st century. The three strands presently taken up for building social media solutions/interventions are agriculture, healthcare and technology infrastructure.

Project

The project brief given to us was to come up with a story-line concept of an animation for 4 to 6 years old kids in which the kids can also interact with the story and change it accordingly through the medium of certain hand gestures which were already programmed. Gesture recognition, colour recognition and voice recognition were the technology involved in the project. We had to come up with a story which is easily understood to by kids of that age group, also the story had to something which kids can easily connect to with their day to day activities.

Research

To understand child psychology and their day to day challenges and learnings I started my research by reading the works of famous child psychologists, educationalists, cognitive science researchers.

4 to 6 years olds

The magic years

According to child development expert Selma Fraiberg, PhD, 1959 “When a child doesn’t able to grasp about the world around them, and often make up their own magical explanations for how things work, was dubbed the magic years”. As they develop, they begin to understand the basic function of things. For example “If I push this button, the pony will pop out of the barn!”. Slowly, they take this knowledge and combine it with a growing imagination to come up with fantastical ideas about why and how things happen. As kids go through the magic years, fantasy will move to reality as they further fine-tune their understanding of the world.

The absorbent mind

Maria Montessori was born in 1870 and was the first woman in Italy to receive a medical degree. Maria Montessori is the founder of Montessori philosophy of education. In 1907 Dr. Montessori founded a school where she developed and refined a method of education based upon her scientific observations of the children. Her educational method is in use today in public and private schools throughout the world. She observed that young children learn in a unique way from prenatal life to about six years old. The child is endowed with an unknown power and this unknown power guides us towards a more luminous future. The absorbent mind is the image she created to describe, this intense mental activity.

The “Absorbent Mind” in which the child’s mind is like a sponge, absorbing all that is in the environment. At age 0-3 this is unconscious At age 3-6 this is conscious Montessori saw the absorbent mind in two phases. The period

goes from birth to six years. This period shows notable differences, but during its whole length the type of mind is the same. From zero to 6 the period shows two distinct sub-phases.

First phase of absorbent mind

During the first phase, from birth to three years old, the young child unknowingly or unconsciously acquires his basic abilities. She called it the period of unconscious creation or the unconscious absorbent mind. The child's work during this period is to become independent from the adult for his basic human functions. He learns to speak, to walk, to gain control of his hands and to master his bodily functions.

Second phase of absorbent mind

Once these basic skills are incorporated into his schema, by about three years old, he moves into the next phase of the absorbent mind, which Montessori called the period of conscious work or the conscious absorbent mind. During this period, the child's mathematical mind compels him to perfect in himself that which is now there. His fundamental task during this phase is freedom; freedom to move purposefully, freedom to choose and freedom to concentrate. His mantra is "Let Me Do It Myself!". The years between three and six which are not only the prime time for laying down the foundation for a good education academically but most importantly the years when a child learns of their social and cultural existence.

Key features of second phase of absorbent mind

- Child is like a sponge in absorbing his environment - a capability naturally flows within him.
- The child starts to show signs of a conscious thirst for knowledge.
- After acquiring the knowledge to speak and to walk, a child learns to move deliberately.
- It is during this time where the child might start asking questions of the, "why" and "how" kind.

- New skills are rapidly and easily acquired without much effort or stress.
- The child is also very tactical, hands-on, and wants to touch every- thing.
- Child forms images or impressions within his mind that stay permanently.
- Child acquires freedom to choose, freedom to concentrate and freedom to move.
- Starts to become independent and more aware.
- He discovers and explores the world by himself in his own unique way.
- Let me do it myself is the mantra
- Interacts with material and environment.
- New experiences come together, develop, and integrate the abilities earlier created
- Development of skills is open and continuous
- Interacts with the environment consciously and intentionally,
- Receives impressions, processes, categorises, interprets and fit them into an inherited structure
- The structure gradually changes and unfolds as the child grows
- Absorbed experiences create the child's intellectual abilities.

Suggested activities for the conscious development phase of absorbent mind

Practical Activities Develop personal and social skills used in daily living for e.g. dressing one- self, cleaning, being polite

Sensorial Activities Serve to enhance and enlarge the child's sense perceptions of the world Language Reading and writing, story narration and enacting, pretend play

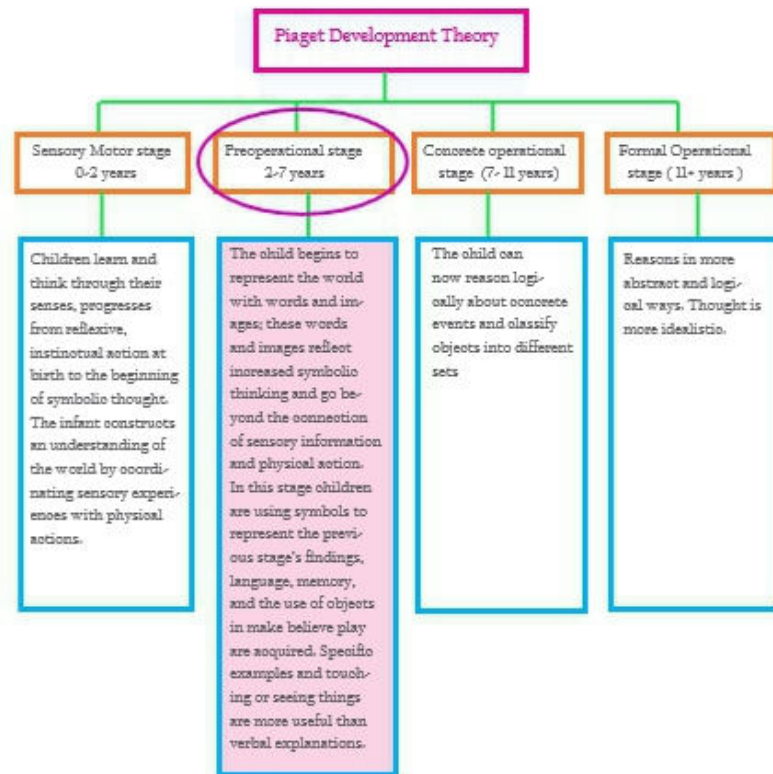
Mathematics Introduce counting and arithmetic Cultural Exposes child to fields of inquiry as physical science, history, geography, anthropology and biology.

Cultural Exposes child to fields of inquiry as physical science, history, geography, anthropology and biology.

Theories of cognitive development: Jean Piaget

Jean Piaget (1896-1980) was a Swiss biologist, philosopher, and psychologist best known for his work in the area of developmental psychology. At first he dedicated his time to mollusc research. Later, after working with children, Piaget noticed that children of a younger age answered questions qualitatively different than those of an older age. This suggested to him that younger children were not less knowledgeable, but gave different answers because they thought differently. Piaget's theory is based on stages, whereby each stage represents a qualitatively different type of thinking. Children in stage one cannot think the same as children in stage 2, 3 or 4 etc. Transitions from one stage to another are generally very fast, and the stages always follow an invariant sequence. Piaget acknowledged that there is an interaction between a child and the environment, and this is a focal point for his theory. He believed a child cannot learn unless they are constantly interacting with their environment, making mistakes and then learning from them.

The four stages of cognitive development.



Key Features of Preoperational Stage of Development

- Language is the most flexible means of mental representation.
- Learns to use language and to represent objects by images and words
- Magical thinking predominates
- An important feature is animism. It is the belief that inanimate objects such as toys and have human feelings and intentions.
- Sensory motor activity provides the foundation for language, just as it underlies deferred imitation and make-believe play.
- Make-believe play increases dramatically during early childhood.
- Through pretending, young children practice and strengthen newly acquired representational schemes.
- Children also become increasingly adept at using symbols, by the increase in playing and pretending. For example, a child is able to use an object to represent something else, such as pretending a broom is a horse.
- Role playing also becomes important. Children often play the roles of "mommy," "daddy," "doctor" and many other characters.
- Make-believe play gradually becomes less self-centred as children realize that agents and recipients of pretend actions can be independent of themselves.
- Play also includes increasingly more complex scheme combinations.
- Socio-dramatic play is the make-believe play with peers that first appears around age 2 1/2 and increases rapidly until 4 to 5 years.

Pretend Play

Play and imitation are an important part of Piaget's theory. Imitation or pretend play is the child's serious attempt to accommodate to outer reality which they had seen and heard about. As children develop the ability to represent experience symbolically, pretend play becomes a prominent activity. In this complex type of play, children carry out action plans, take on roles, and transform objects as they express their ideas and feelings about the social world

Simple Pretend play

Some pretend play is solitary; Children often assume stereotyped character roles drawn from the surroundings, such as teacher, different animals, shopkeepers, workmen etc. Children also get fascinated with fictional character roles drawn from books and television, such as He-Man, Ben-ten, Chotabheem etc. Fantasy play is a manifestation of symbolic representation the child represents objects and ideas through play situations

Sequential Pretend play

Sequential pretend play has action plans. Action plans are blueprints for the ways in which actions and events are related and sequenced. Family related themes in action plans are popular with young children, as are action plans for treating and healing and for averting threats. Roles are identities children assume in play. Some roles are functional: necessary for a certain theme. For example, taking a trip requires passengers and a driver. Family roles such as mother, father and baby are popular, and are integrated into elaborate play with themes related to familiar home activities. By the age of four or five, children's ideas about the social world initiate most pretend play. Pre-schoolers' pretend or socio-dramatic play is often shared with peers in the school or neighbourhood. The child plays through situations very much like an adult thinks through a situation.

Play

“Play is the highest form of research.” – Albert Einstein

Early childhood is a period of critical developmental stages and learning. Play as an intrinsic behaviour of children. Play empowers children to learn about themselves, others and their world. Through play, they develop the physical, mental, social, emotional and creative skills needed for life. Often described as “a child’s work,” play lays the foundation for reading, writing, mathematical reasoning and creativity. Children play because it is fun. Play is a key to their learning and development. Playing, both structured and unstructured, lays the foundation for a child's development of future learning and life skills. Play enables a child to try out new skills and roles without fear of failure and it provides an opportunity for expressing emotions in an appropriate way. It helps children:

Develop their knowledge, experience, curiosity and confidence
Learn by trying things, comparing results, asking questions and meeting challenges
Develop the skills of language, thinking, planning, organizing and decision-making.

The types of play

The different types of play do not exist in isolation but are closely inter-dependent and inter-related. All children go through a process of play development.

Exploratory Play

Physical Play

Constructive Play

Imaginative Play

Social Play

Exploratory Play

Initially the child explores objects and toys using all his senses. By doing this he begins to build up concepts about his world which are essential. Later, exploratory play helps to extend the child's knowledge of his world. Early in a child's life he will only recognise an object in a particular situation and will not be able to generalise e.g. he will recognise his own cup only at mealtimes. As the child matures he will be able to look for an object which has been hidden in full view of him. This is called "objects permanence." This shows he has formed an internal picture or representation of the object. He also learns that his actions on toys produce a result, which is the start of early cause and effect e.g. banging a drum. The child should have access to a range of toys and everyday objects which are of interest to him. Care givers should observe how a child plays, demonstrate how to use them appropriately and how him how to use objects in real situations, if necessary for e.g. give him a spoon to hold while he is feeding. Let the child take the lead, here the role should be to extend and guide his play. Toys and other objects must provide experience of looking, listening, feeling, smelling and tasting.

Physical Play

As the child becomes more mobile he develops gross motor skills e.g. running, jumping, climbing, dancing. Not only is physical exercise healthy for children, it can encourage sharing and turn taking. As the child moves around his environment he learns about the objects and events in his world which are vital for the overall development. Physical play can also relieve boredom and frustration therefore reducing challenging behaviours. Physical play requires adequate space and careful supervision. The child may need motivation to move, so he should not have everything provided for him by the adult. The role of the caregiver is to support the child to help coordinate his movements.

Constructive Play

Children learn to co-ordinate their fine motor skills through a variety of activities e.g. building, threading, stacking, interlocking games, craft activities. Again this develops the child's ability to share and take turns with others and develops a new set of vocabulary. A child also learns concepts

Of colour, size, shape, weight and texture. It can also help the child to understand what effect he can have on objects and what effect they have on each other. It can help him to develop a problem solving approach. The child stores visual information which he uses at a later date, thus developing memory skills. Importantly it can give the child a sense of achievement when he completes a task.

Imaginative Play

Imaginative play is very important in encouraging children's development, as it involves the child's use of symbolic understanding. This is when a child understands that one object or picture can symbolise another. Verbal comprehension cannot develop without symbolic recognition. Early imaginative play begins through imitation and in this way the child learns simple make believe scenarios e.g. pretending to drink from an empty cup. Children like to pretend. This should be encouraged, as it develops their imagination and creativity. It also helps the child understand different ways people behave. He will move on by continuing to imitate everyday activities and starts to recognise dolls and teddies as representing people e.g. when mum baths the baby, the child baths the doll. He also begins to recognise miniature toys. As he matures he will re-enact recent experiences e.g. going to the shops. The child will then start to engage in make-believe play involving invented people and objects. At this stage he can pretend an empty box is a house or boat or spaceship and use small world toys to re-enact social situations.

The adult pretends to talk to the child on the toy telephone and offers the child the receiver to see if he or she will imitate. The child may copy the action without saying anything and hopefully will move on by responding with spoken language. The adult has modelled pretend play by showing how an action with a toy can symbolise a real life action and backing it up with language to clarify the meaning of the action.

Social Play

In social play a child undergoes following stages:

Solitary

Early on a child's play tends to be solitary. He explores and learns about the objects he plays with but does not engage with others around him. As he becomes older he may still have periods when he needs to play alone but it is important he does not become stuck at this stage.

Parallel Play

Children start to play alongside each other e.g. standing around the water tray. They watch each other and may attempt occasional interactions. Towards the end of this stage they may begin to co-operate with other children by sharing toys and they may take turns with at least one other child.

Co-operative Play

Children enjoy the friendship of other children and want to interact with them. They learn to play together, share and take turns in small groups. Disagreements will sometimes still occur. Later the children can take part in activities without close adult supervision. Their play routines become more imaginative – social understanding has developed alongside their communication skills and they should be able to take part in meaningful conversations.

Through play the child is being encouraged to become more social and make friends, thus increasing his confidence in communicating and other activities.

Play is an intrinsic behaviour in children; it comes naturally to them right from childhood. Children learn life's most important skills while playing. Toys act as a catalyst for the learning process. Toys are vital tools that help foster the mental, physical, emotional and social development of children. Toys are basic instruments for the development of children's fantasy, thoughts and creativity. Age appropriateness is an important criterion in toys. Developmental stages occur rapidly in early childhood. The broad areas of development also show certain patterns of play behaviour.

Sensory-motor stage

From 0-3 years children experience this stage. They experience the world through movement and senses and learn object permanence. They understand the world through their senses and try to make contact with them through sensory-motor activities.

Zero to six months

Infants use their senses to learn about their world. For the first few months of life, babies are unable to grasp objects with their hands, but enjoy exploring with their ears and eyes. Therefore, toys that make noise or feature high-contrast, black-and-white or brightly coloured images are especially appealing to new-borns and young infants. Once infants can reach for objects, they enjoy toys that are textured and safe for mouthing.

Six to twelve months

In the second half of the first year, infants master the motor skills that enable them to play with toys in new and exciting ways. When babies can sit up, they enjoy toys they can manipulate – to bang, drop, and stack, put in and take out, and open and shut. Once they can crawl, “cruise” (walk while holding furniture) and walk, they enjoy things that move along with them. Toys that show cause and effect are also thrilling at this age.

One to two years

In the second year of life, children are explorers, curious and wanderers, toddlers possess the physical skills that make it easy for them to play and learn. A busy toddler needs toys for physical play – walking, climbing, pushing and riding – and ones that encourage experimentation and manipulation. At this age, children imitate adults and enjoy props that help them master life skills.

Two to three years

Older toddlers love testing their physical skills – jumping, climbing, and throwing – and enjoy toys for active play. This age group also possesses good hand and finger coordination and enjoys putting these skills to work

with basic arts and crafts, puppets, blocks and simple puzzles. Imaginative play also begins in the third year.

Pre-operational stage

From ages 3 to 6 children acquire motor skills and enjoy imagination and fantasy. Children are also found to be egocentric at this age.

Three to six

After the age of three, children begin to play actively with each other. Pre-schoolers and kindergarteners are masters of make-believe. They like to act out grown-up roles and enjoy costumes and props to help them bring their imaginations to life. It is quite common for children this age to develop strong attachments to favourite toys, expressing feelings to a special doll or teddy bear. Materials for arts and crafts are also popular with this age group, which enjoys creating things with their hands.

Role of play in education

True learning brings a sense of joy and fulfilment to a child in the same manner that play does. Play way methods and approaches play a very important role in true learning. Two famous educationalists Friedrich Froebel and Gijubhai Badheka advocated the importance and role of free play in childhood.

Friedrich Froebel

Friedrich Froebel was a German educationalist, best known as the originator of the 'kindergarten system'. Froebel sought to encourage the creation of educational environments that involved practical work and the direct use of materials. Through engaging with the world, understanding unfolds. Free play is a creative activity and through it children become aware of their place in the world. This came with his belief that humans are essentially productive and creative. He also developed special play material for children known as Froebel gifts. Each of the gifts is actually a toy/puzzle which the child is supposed to play with and develop various abilities. The principle behind the same is 'from real to abstract' and 'learning by doing'. He also recommended a series of activities like games, songs, construction activities and free play, gardening etc. His strong belief in elements from nature led him to the concept of 'kindergarten' or garden for children. Activities involving imagination and creative thoughts were to be carried out before the development of basic knowledge. There were activities which could be carried out alone or in a group. Thus the Froebel system of education was able to integrate play and the use of toys effectively for learning in kindergarten system. The emphasis of Froebel education system is on imagination-creativity development, sensory-motor development and cognitive development

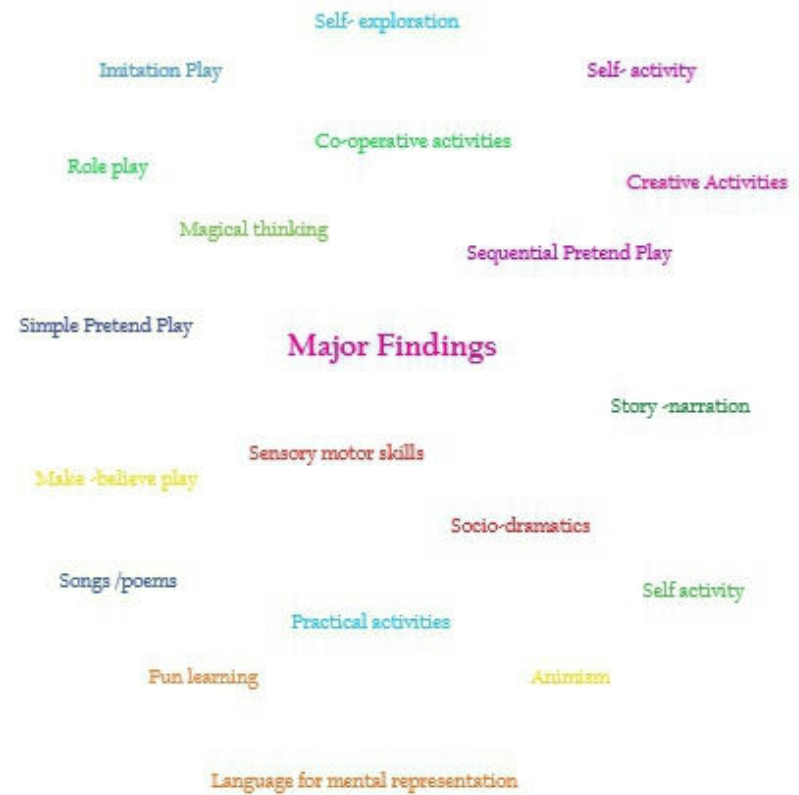
Gijubhai Badheka

In India one of the pioneers of education Gijubhai Badheka started his experiments with learning. He was an educationalist and author who continue to be praised for his playful innovations and inspirational work in the field of teaching. Gijubhai system is based on the foundation and principles of Montessori education and oriented to fit Indian requirements. He insisted on enjoyable way of education by including a lot of stories and poem recitation, which made learning a good experience. It is interesting how he extended it and incorporated elements like storytelling, puppetry etc, as a part of education. His basic premise came from the Montessori system which believed that children have a natural love for learning and will find joy and fulfilment in new discoveries. Freedom and love was the twin principles around which the system revolved. For children, learning is the intrinsic award and there is no need for any other material award in terms of prizes or rank. Learning and growth also helps the child to increase his/her self-worth. The process of child discovering new knowledge is as important as the end learning. The basic activities for learning are centred on practical life activities, activities for sensory development, language skills and mathematics skill. Gijubhai encouraged the use of stories as a means of learning. In fact he himself wrote the stories, encouraged students to enact the same. This model was very successful as it placed emphasis not only on learning language skills but also on the social-emotional development of children. Gijubhai Badheka placed emphasis on the conventional Montessori system of sensory motor and cognitive development as well as on the social – emotional development of children through storytelling, drama, puppets etc.

Play-way method

- Play is the characteristic activity of childhood. It is the highest phase of child-development-of human development to this period, for it is self-active representation or the inner-representation of the inner form, inner necessity and impulse. Play cultivates the habits of action, feeling, thinking, courage, instinct and motivation.
- Self-activity fills the gap between knowledge and action; it gives joy, freedom, contentment and peace of mind. Self-activity is promoted through song, movements and construction. At pre-school stage they should be allowed to see, handle, arrange, rearrange, make and unmake things themselves.
- Besides spontaneous self-activity and play activities, Froebel has also recommended manual work, nature study, natural sciences, languages, art and religious instruction.
- Child is creative by nature. If he is given some material, he will at once try to create new forms and combinations with that material. Children should be exposed to more and more creative stuff; thinking must express itself in doing.
- Children should be indulged in co-operative activities so that the child receives physical training as well as intellectual, social and moral education.
- The child should be enabled to use his senses, limbs and muscles and to make him familiar with the objects, around him. Froebel emphasized sense-training, against merely verbal instruction. Since senses are the gateways of learning, their training must form the first step in the child's education.
- Respect the child's individuality and work it out by means of the child's own initiative and effort.
- Gijubhai's system liberally borrowed from the educational philosophies of Montessori, Frobell, and others and oriented the admixture to fit Indian requirements.
- Freedom and love were the twin principles around which the system revolved. With the introduction of equipment for sensory development,

Coupled with the use of music, dance, travel, story-telling and play-ground as instantly acquired popularity with children and parents.



Inferences

- Kids get influenced by their caregivers and peer group, they closely observe their actions and accordingly make rules in their mind.
- Kids generally are very independent (at least they pretend to be) they like to make choices of their toys and clothes on their own
- Kids love to be surrounded by people, they need constant attention and gets upset if they think that proper attention is not given to them
- Kids imitates their caregivers and friends.
- Kids love to explore things on their own and feel very happy when they achieve what they were exploring for, it could seem to be a very small thing for grownups.
- Kids loves outdoor activities like running, jumping, enacting, dancing, and singing.

Inferences from experts

- Children have an amazing capacity of learning and they learn very faster if the learning process is enjoyable for them.
- Children learn a lot of things simultaneously, some are directly visible, some project later.
- The preschool concept is taken from foreign countries and is transformed according to Indian scenario in which there is a lot of rush at the time of admission and a kid has to be very well prepared for admission , this some- times over burden a child from a very tender age.
- Preschool age is the most formative years of a child and ideally he/she should be given a lot of time to explore on its own to be creative about the situations

- Kids are least interested in learning from books at this age. They love colourful aids to learn and the best way is when they don't realize that they are studying, learning while playing is fun.
- Children by nature have an urge for learning, their process is very fast as in less amount of time they have to learn a lot. A toy should not overburden a child for learning, it should act as a supporting element in the self-learning process of a child
- Every child has its own learning speed, they accumulate information in their minds and reflect that information with their own will, hence some information is said to be learnt earlier and some later.

Pre-school

Preschool education is the foundation of a child's education. And today, with both the parents working, preschool is becoming a part of a child's life. It commences before a child starts kindergarten. At play schools, children are exposed to a lot of basic preschool learning activities that help them to get independent faster. These preschool activities help develop in children many self-help qualities like eating food themselves, dressing up, maintaining cleanliness and other such basic qualities. There are year-lesson plans prepared by the playschool teachers. This annual pre nursery school lesson plan helps the teachers in understanding what needs to be done throughout the year. Preschool lesson plans usually revolve around various interesting themes. In a preschool setting the ideal teacher child ratio would be 10:1 but this differs from school to school. Too many children are not good as the teacher would not be able to concentrate on each and every child. So the lesser number of kids the more better it would be for the child.

Ideal age to start Preschool 3-4 years of age (in Indian context)

Inferences

- Preschool children want to touch, taste, smell, hear, and test things.
- They are eager to learn by experiencing and exploring.
- Pre-schoolers learn and developed skills from their play.
- Fear can develop during the preschool years, their common fears include new places and experiences and separation from parents and other important people.
- At this age, they are establishing themselves separate from their parents, they can express and demand for their needs.
- They use silly or forbidden words while speaking.

- Pre-schoolers sometimes have trouble in getting along with other children and sharing may still be more difficult.
- Because of their developing imaginations and rich fantasy lives, they do not very well differentiate fantasy from reality, some also talk about imaginary friends.

Collective Analysis

- Children by nature have an urge for learning; their process is very fast as in less amount of time they have to learn a lot. A toy should not overburden a child for learning; it should act as a supporting element in the self-learning process of a child
- Children have an amazing capacity of learning and they learn faster if the learning process is enjoyable for them, they learn a lot of things simultaneously; some are directly visible, some project later.
- Preschool age is the most formative years of a child and ideally he/she should be given a lot of time to explore on its own to be creative about the situations, they are least interested in learning from books at this age.
- They love colourful aids to learn and the best way is when they don't realize that they are studying, learning while playing is fun. pre-schoolers are explorer and imaginative; they don't like to follow rules, they are very energetic and hence a product should utilize their energy in a good way.
- Every child has its own learning speed, they accumulate information in their minds and reflect that information with their own will, hence some information is said to be learnt earlier and some later.

- A kid starts going to play school when he/she is only 2.5 years old, hence there is not much need of educational toys at home because he/she is already getting his/her kind of education in the preschools, parents buy toys with a mind-set that it has to be broken, they only see that the toy should not be toxic and hazardous.
- Kids should play outdoors after school and they should not be given homework, kids love outdoor activities like running, jumping, enacting, dancing and singing.
- Imaginative plays and storytelling is the best way to teach children, they take most interest and remember things.
- Children have short attention span, hence they tend to lose interest in any- thing which is not exciting them, and hence the toy should be of a kind that it indirectly instigates learning.
- Kids love to explore things on their own and feel very happy when they achieve what they were exploring for, it could seem to be a very small thing for grownups.

Important Keywords

From the initial research, following keywords have emerged, these are the basis of my concept building, all my final concepts evolved from these keywords

- Pretend play
- Imitation
- Sensory stimulation
- Role play
- Language and communication
- Expression

Development Milestones

Milestones: 3-Year-Olds

Motor Development:

- Walk, climb, run
- alternates feet when climbing stairs
- assembles simple puzzles
- manipulates clay; finger paints
- copies simple shapes, such as a cross or circle
- stacks blocks

Language and Thinking Development

- understands most of what is said
- speaks in complete sentences of three to five words
- matches pictures to objects
- learns by doing and through the senses
- understands concepts of "now," "soon," and "later"
- begins to recognize cause-and-effect relationships

Social and Emotional Development

- follows simple directions; enjoys helping with household tasks
- begins to recognize own limits — asks for help
- likes to play alone, but near other children
- does not cooperate or share well
- able to make choices between two things
- begins to notice other people's moods and feelings



Challenges

- Transitions are difficult at this age.
- Rituals are important. Routine will give a 3 year old a feeling of security.
- Recognition of colours and numbers in daily life/
- Encourage independent activity to build self-reliance.
- Provide lots of sensory experiences for learning and developing coordination — sand, mud, finger paints, puzzles.

Milestones: 4-Year-Olds

Motor Development

- running is more controlled
- can easily catch, throw, and bounce a ball
- can brush teeth, comb hair, wash, and dress with little assistance
- copies crosses and squares
- prints some letters
- uses table utensils skillfully
- cuts on a line

Language and Thinking Development

- uses a 1,500-word vocabulary; speaks in relatively complex
- understands words that relate one idea to another — if, why, when
- continues to learn through experience and the senses
- understands, mostly, the difference between fantasy and reality
- understands number and space concepts — more, less, bigger, in, under, behind
- thinks literally; starting to develop logical thinking

- begins to grasp that pictures and symbols can represent real objects
- starts to recognize patterns among objects — round things, soft things, animals
- grasps the concepts of past, present, and future but does not understand the duration of time

Social and Emotional Development

- takes turns, shares, and cooperates
- expresses anger verbally rather than physically
- can feel jealousy
- may sometimes lie to protect herself, but understands the concept of lying
- enjoys pretending and has a vivid imagination

Milestone- 5 years old

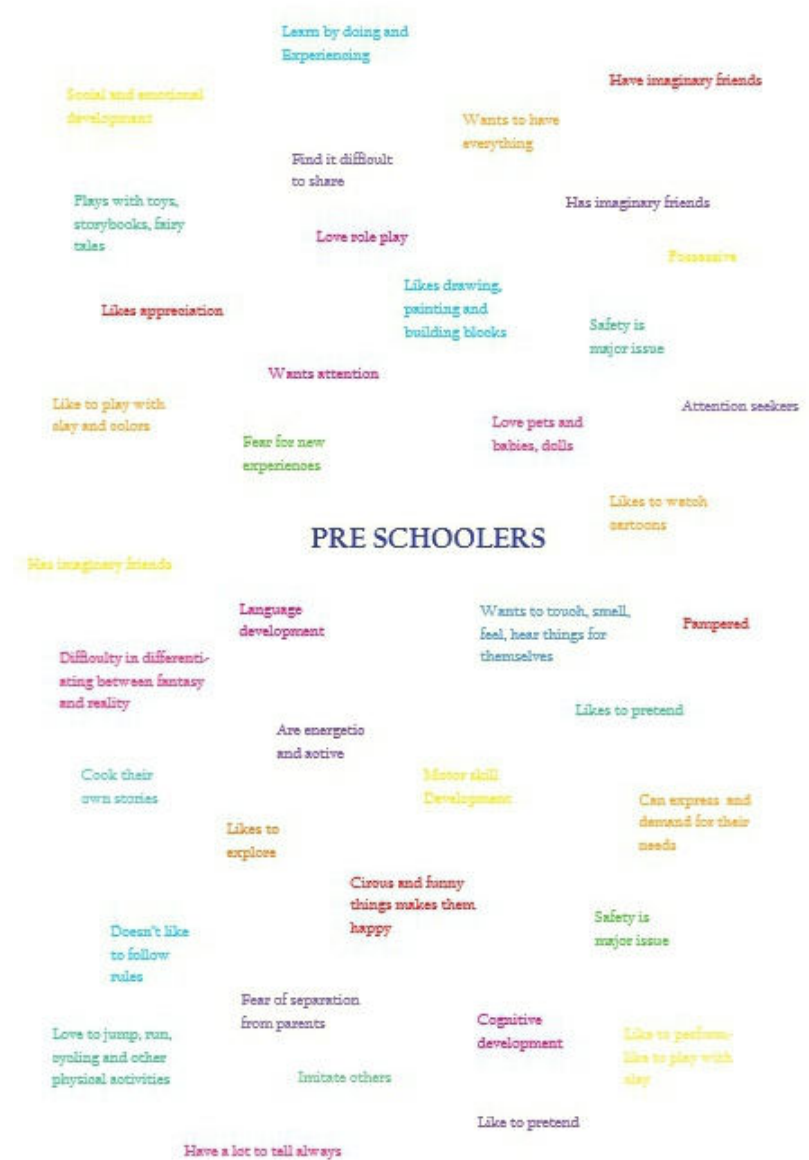
- Speak clearly using more complex sentences
- Count ten or more objects
- Correctly name at least four colors and three shapes
- Recognize some letters and possibly write his or her name
- Better understand the concept of time and the order of daily activities, like breakfast in the morning, lunch in the afternoon, and dinner at night
- Have a greater attention span
- Follow two- to three-part commands. For example, "Put your book away, brush your teeth, and then get in bed."
- Recognize familiar words, such as "STOP"
- Know his or her address and phone number.

Movement milestones, hand and finger skills

Children learn through play, and that is what your 4- to 5-year-old should be doing. At this age, your child should be running, hopping, throwing and kicking balls, climbing, and swinging with ease.

Other movement milestones and hand and finger skills your child may achieve in the coming year include being able to:

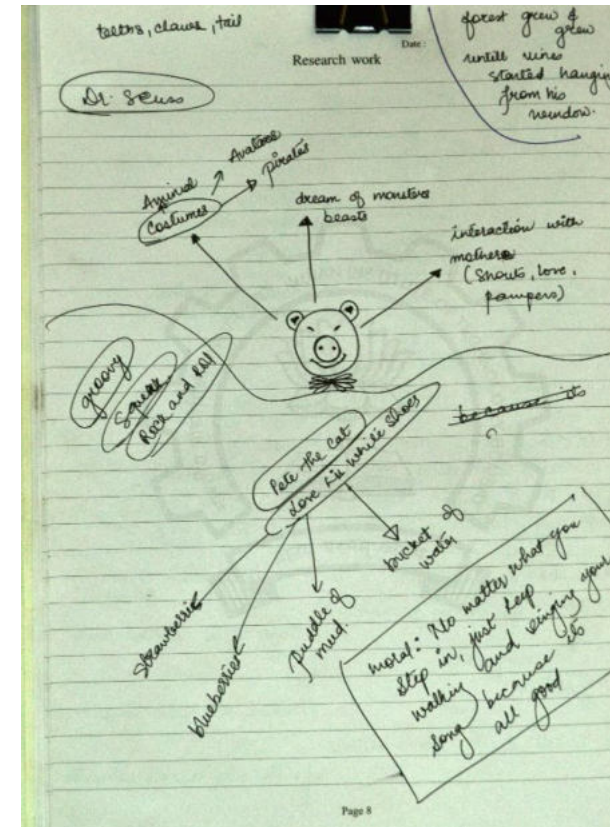
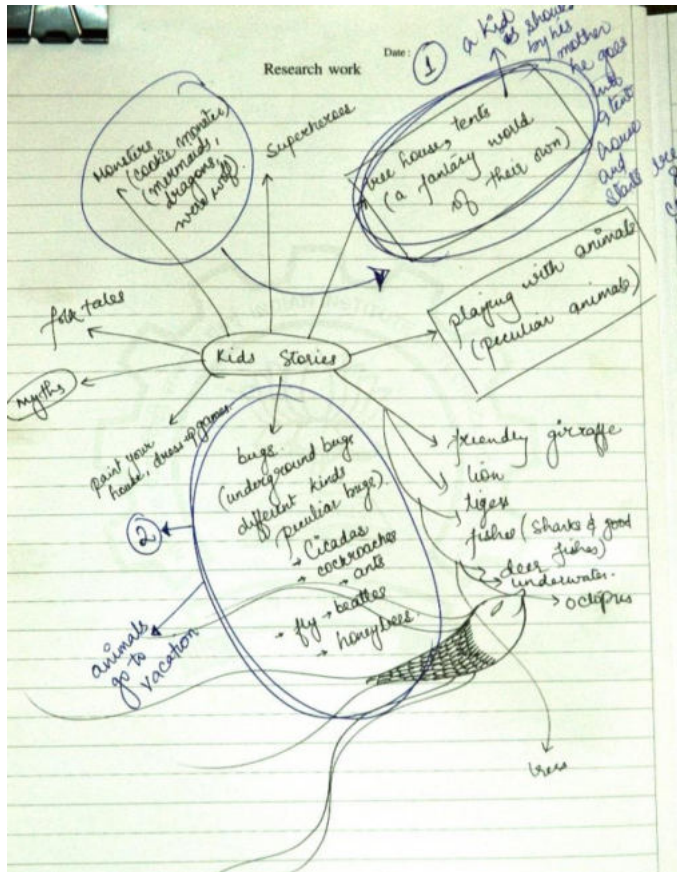
- Stand on one foot for more than 9 seconds
- Do a somersault and hop
- Walk up and down stairs without help
- Walk forward and backwards easily
- Peddle a tricycle
- Copy a triangle, circle, square, and other shapes
- Draw a person with a body
- Stack 10 or more blocks
- Use a fork and spoon
- Dress and undress, brush teeth, and take care of other personal needs without much help





Story Explorations

As my research was growing and so was my understanding on the topic, I started writing drafts of my story. After writing a few stories and themes I came up with two final stories.



STORY I

LEVEL 1

A kid who is really bored in his class, he looks out of the window, it's raining and the weather is amazing. In the background the teacher is teaching about underwater life.

He is staring out of the window and wants to go out and play. Suddenly he notices a strange bird out of his window, the bird comes and sits next to the window and winks at him. The bird gives him a hand and they both jump out of the window. He looks back at his class, the teacher is still teaching about underwater animals.

He sits on his upside down umbrella and using it as a boat he goes on a journey through drain.

He has no idea where he is going but he is extremely excited.

He swims away to a colourful far away land which is full of funny looking animals and plants.

There he'll meet all the underwater animals and plants, he'll meet singing fish, sneezing turtle, pirate octopus, a grumpy fish. He'll meet water monsters, good fishes, bad fishes. He'll see peculiar animals living inside a sunken ship, curious floating objects, a strange city, a world inside a message bottle etc. Then suddenly he'll start listening his teacher's voice coming from nowhere, his dream will get over and he is back to the class. He'll look around, the teacher is teaching about the same animals he made friends with in his adventurous dream, his classmates are still looking at the black board with the same bored look.

Now he loves to go to school.

LEVEL 2

Same situation only this time he takes his umbrella and flies away to an adventurous journey to a world full of stars, moon, constellations, planets etc.

When he comes back from his dream his teacher is teaching about the same thing.

Now he is no more bored in the class.

LEVEL 3

He goes underground and meets all the bugs such as Cicadas, cockroaches, ants, beetles and their neighbours, all the night animals such as Possum the rat, moths, toads etc.

He imagines whatever his teacher is teaching that day and he comes back to the class after the adventure.

Story II- Final Story

A kid is not eating his dinner, so his mom shouts at him and he gets really angry.

He goes to his small tent house which he has made out of his mom's saaree and refuses to come out.

Suddenly he'll see that his small tent house is converting into a giant jungle, trees are growing beside his pillow and bushes are growing next to his feet, he is surprised, He finds himself in the middle of a thick dark forest.

There he'll see a lot of wild hungry monsters eager to eat him, but he is not afraid.

Because of his smartness, he tames the angry ones and makes friends with the gentle ones. Now all the monsters want him to stay here with them but he has started to miss his mother and her hand cooked food. He has to go back.

He says goodbye to his new friends and goes back to his house, he goes to the dinner table and eats the dinner with pleasure.

The Characters

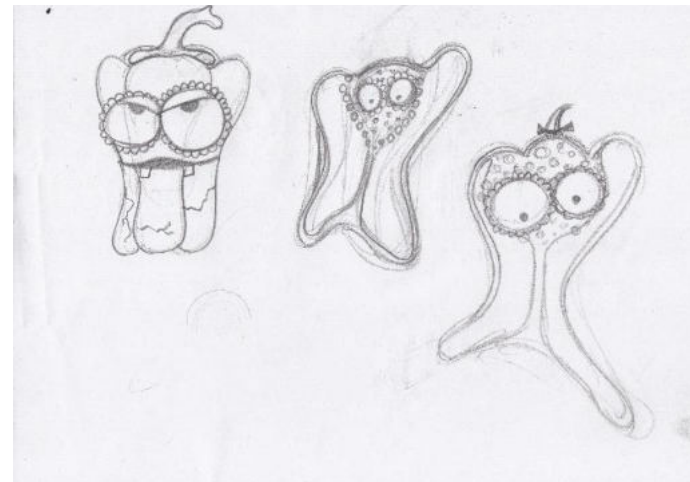
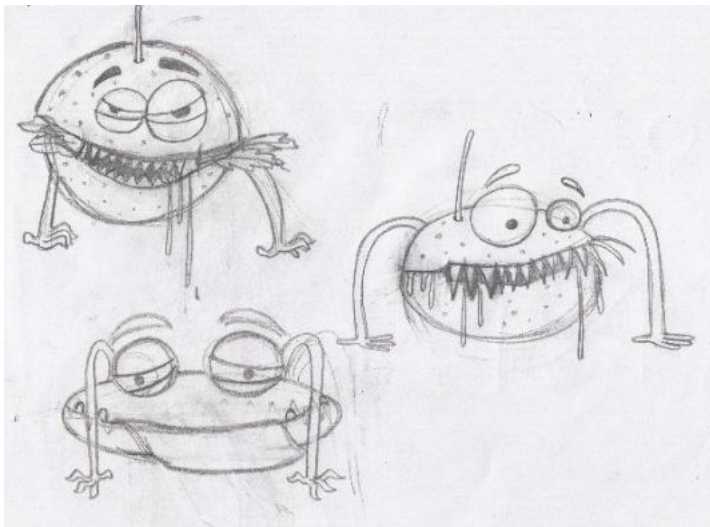
Main Character, Bunny

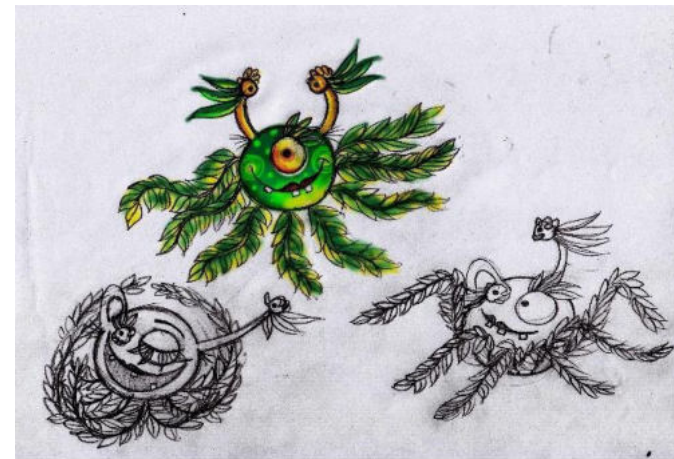
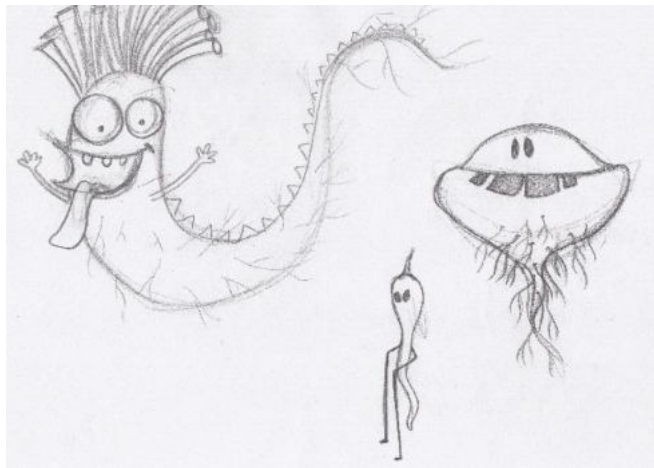
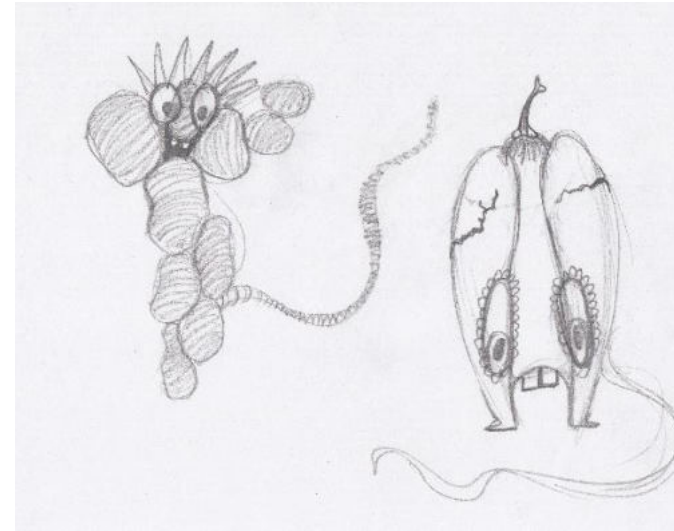


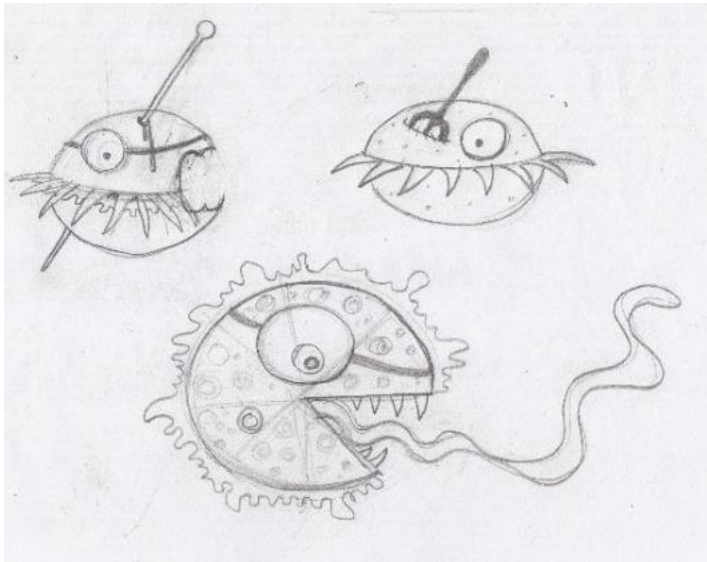
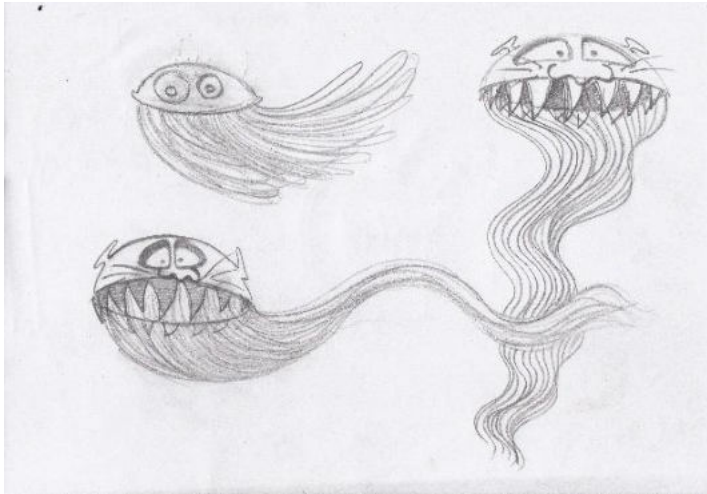




Characters For Food Monsters







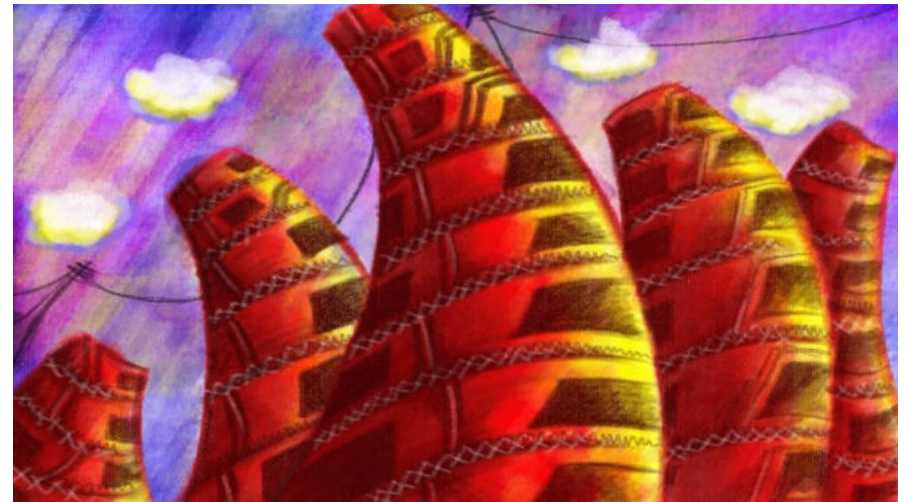
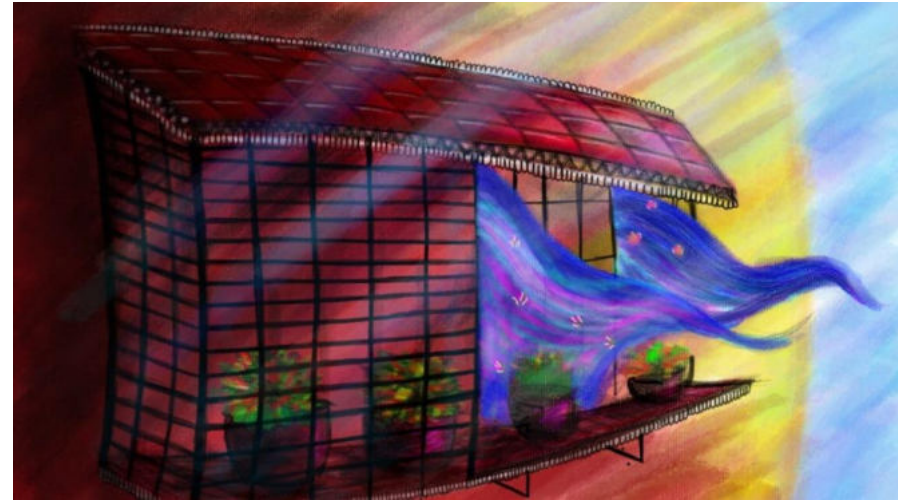
The development of these characters was a fun process where I just went crazy thinking about how food can be perceived as an evil or a good character. During the execution part I happen to simplify all the characters a lot because of time and design constraints we were supposed to design a 2D game play like Tetris or Mario.

The Look and Feel of the Animation

I wanted to give the entire animation a very hand-drawn crayon (pastel) look to it. The colour palette is very bright and quirky so that it is attractive for 4 to 6 years old kids.

Explorations of The Environment





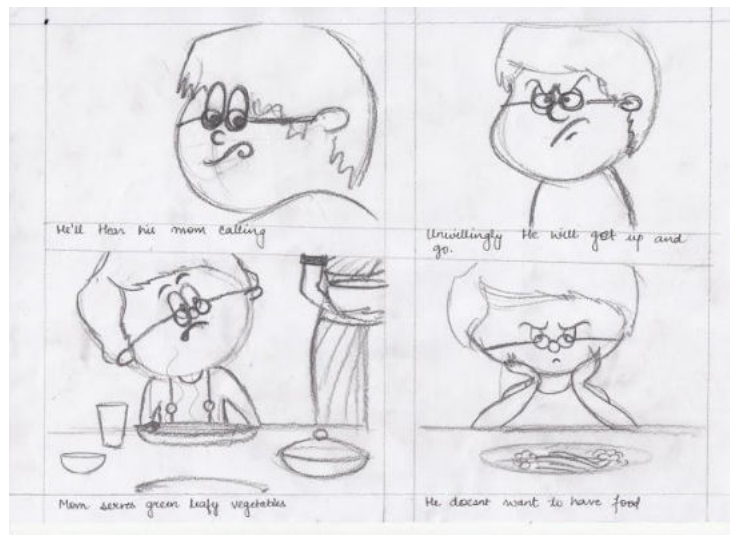
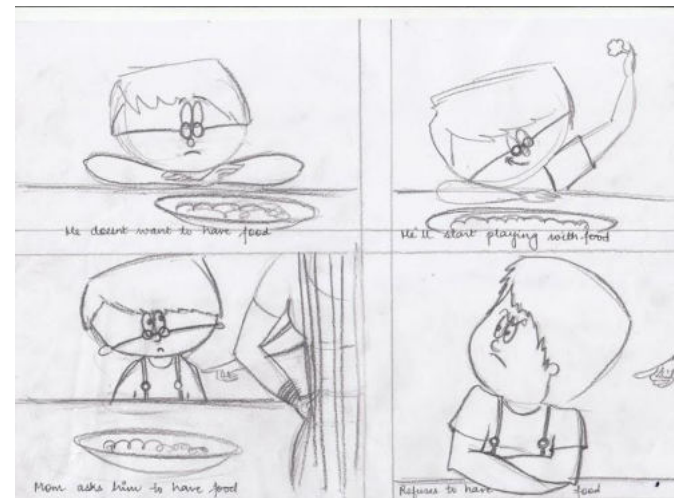
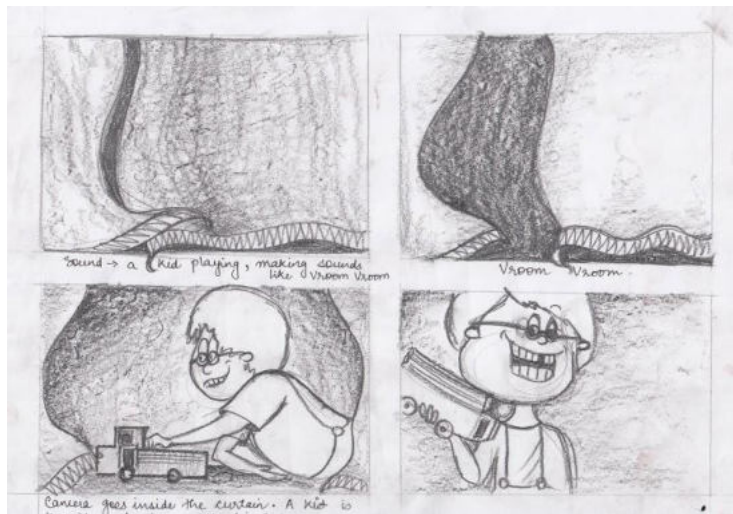
The Technique and the Medium

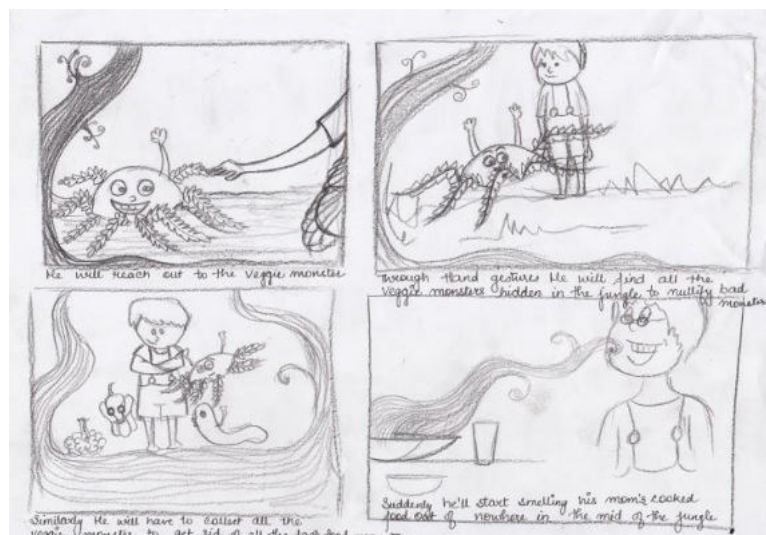
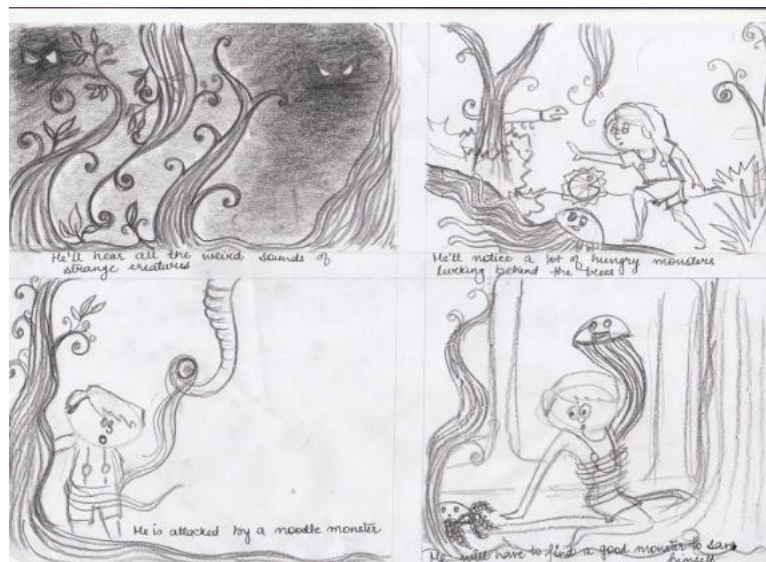
To achieve the look I had in mind, I decided to do the entire animation in Photoshop since the pastel feel was easily achievable in that software. I have done compositing in Aftereffects Pseudo 3D layers and final edit in Adobe Premiere.

Story Board

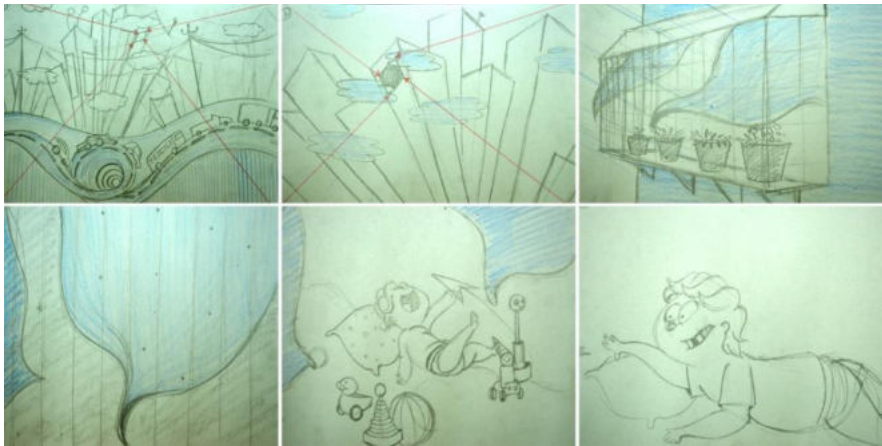
To translate your story from words to visuals we need a storyboard. Right after the story is ready we need to scribble the visuals to arrive on a decision of the events, look, and camera angles etc. This is a very important step during the whole process because decides the flow of the events and a strong story board is very important to tell a powerful story

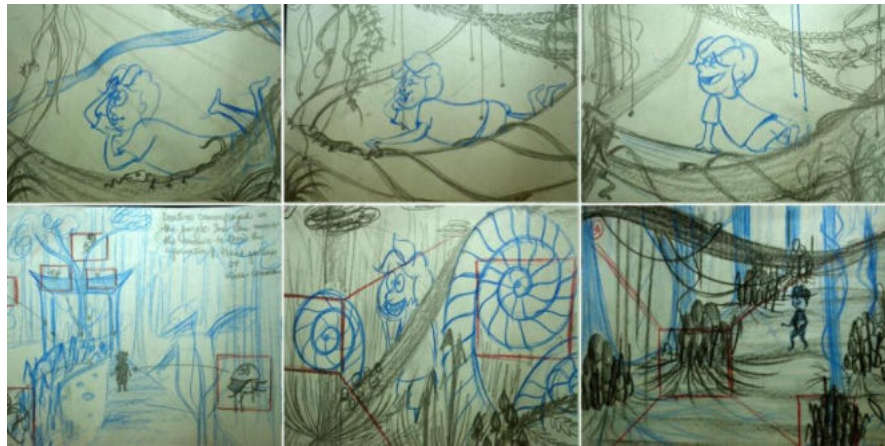
Story Board I





After My first story board, I went ahead and made a detailed storyboard to understand my screen play better.





Animatic

I created each frame keeping in mind the narration behind each visuals to communicate the story entirely and clearly.

I roughly timed the shot as per my judgment showing the transitions motivated by future set of events and actions. I placed the narration on timeline and the timings of fade in and fade out were deliberate. While preparing the animatic I discarded a number of shots in order to form a well-timed sequence matchup with the soundtrack. I fine-tuned the animatic with visuals, scratch sound and music and found the 3 min long animatic for this film.

The Production Plan

Since we had a very strict time constraint, we decided to finish the cut-scenes first so that the story is clear to the viewers and it can be shown as the work-in-progress because it need to be programmed later with hand gesture recognition inputs along with it.

Once the cut scenes will be done, we will proceed to the game play part of the animation, where as an animator my job will be to provide the coders with all the game assets so that they can weave it together and make it a workable full-fledged game for kids to enjoy and learn. Later on we have plans to take it forward and think about different levels of the game in the same lines so that the interest and the learning of the kid can grow. Also, not just hand gestures but voice recognition and colour recognition can also be worked out in the similar concepts. Hand gestures can be taken forward to body gestures such as physical run, jump, pick etc as commands inputs as the technology develops.

Conclusion

This project was a very beautiful learning process as we got the chance to visit and experience an entirely different country and work culture as we had gone to NTU Singapore to work on it.

This wonderful opportunity has opened our minds to new possibilities of animation and understanding of its acceptance as a medium around the world for different purposes. The innovative idea of hand and body gestures, voice recognition and colour recognition has given a new dimension for the application of animation in different fields and for different purposes like making learning and educating a child easy through the medium of story tell.

From the stage of concept building to the execution this project has been a very rigorous learning experience as we struggled with the best suited technique, software, time constraint, adjusting in a completely new environment, getting used to eating habits and work culture in Singapore.

This project has greatly widen my understanding towards the application of animation as a very powerful medium. I sincerely thank IDC, IIT Bombay, NTU Singapore for giving this wonderful and enriching opportunity. Prof. Phani Tetali, Prof. Ravi Poovaiah and Prof Ajanta Sen for being extremely kind to us and treating us like their own family members.

Bibliography

Books referred

Berk E. Laura, Child Development, Prentice-Hall (2010)

Montessori Maria, Secret of Childhood, Random House Publishing Group (1982)

Montessori Maria, The Discovery of the Child, Aakar Books (2004-12-01)

Merryman Ashley, Bronson Po, NurtureShock: New Thinking about Children, Twelve (2011)

Piaget Jean, The Language and Thought of the Child, Routledge Publishers (2001)

Donaldson C. Margaret, Children's Minds, Harper Perennial (19860501)

Gardner Howard, The Unschooled Mind: How Children Think and How Schools Should Teach, Basic Books (AZ) (2011)

McNichols Chaitin John, (Foreword By), Montessori Maria The Absorbent Mind, Publisher: Holt McDougal (1995)

Kuhl K. Patricia, Meltzoff N. Andrew, Gopnik Alison The Scientist in the Crib: What Early Learning Tells Us about the Mind, William Morrow & Company (20001226)

Fay Jim, Cline Foster, Parenting with Love and Logic: Teaching Children Responsibility, Pinon Press (2006)

Gopnik Alison, The Philosophical Baby: What Children's Minds, Love, and the Meaning of Life, Picador USA (2010)

Web References

<http://www.parenting.sa.gov.au/pegs/peg57.pdf>

<http://www.prel.org/products/products/storytelling.pdf>

http://eprints.qut.edu.au/37305/1/Michelle_Taylor_Thesis.pdf

<https://studentjournals.plymouth.ac.uk/index.php/educator/article/view-File/65/119>

<http://www.extension.iastate.edu/Publications/PM1529F.pdf>

<http://www.september21.com.sg/Promotions/ORT/ORT%20Catalogue.pdf>

<http://www.education.com/reference/article/role-story-language-acquisition/>

www.extension.iastate.edu/Publications/PM1529F.pdf

http://www.ehow.com/list_6619358_stages-physical-development-early-childhood.html

http://www.cradle2kindy.com.au/_bpost_1159/The_Importance_of_Stories,Songs_and_Rhymes_for_children_of_all_ages

<http://www.divinecaroline.com/22106/90586-support-child-s-language-development-enhanced>

<http://education.stateuniversity.com/pages/1826/Child-Development-Stages-Growth.html#ixzz27OHUkfY4>

http://psychology.about.com/od/developmentalpsychology/ss/early-childhood-development_2.htm

<http://ecrp.uiuc.edu/v10n1/thompson.html>

http://www.bhcmhmr.org/poc/view_doc.php?type=doc&id=12755&cn=462

http://www.sevencounties.org/poc/view_doc