Cocoon Finger Puppets: Fostering Creativity and Innovative Teaching Through a Participatory Pedagogical Method

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ABSTRACT

Fostering creativity has been the main emphasis in 21st-century educational discourses, leading to engaging innovative teaching approaches and methods. More often, materials used in such activities are unsustainable and offer limited creative manoeuvring possibilities. Considering the size and scale of educational activity worldwide, it would become a significant concern. Puppetry proved efficient in improving communication, narrating concepts, and helping learning outcomes in education. Finger Puppets are relatively modern and easy to make among various puppetry forms, which offers scope for participatory pedagogy. In earlier attempts, silkworm cocoons have been used in handicrafts, value-added products, and limited teaching explorations. The sericulture industry extracts only ~18-23 % of silk filament wrapped around each cocoon, leaving the inner shell (~80%) unutilized, which unwraps an enormous opportunity to explore this unique natural material for its qualities and abundance. The article explores the potential of 'Silkworm Cocoons' as the primary material for creating finger puppets to aid the teaching process at the preschool stage. The insights gained in the study and feedback from educators motivated us to design various character options using a locally available cocoon breed, *Bombyxmori L.,* as a primary resource, envisioning a novel approach to pedagogy. That included identifying the gap, demonstrating the creative possibility of Cocoon Finger Puppets (CFP), and piloting a study to check feasibility at the foundational stage. The iterative design process exposed infinite possibilities that could aid effective pedagogy across educational stages, offering staggered complexity of making and performing. Hence, we propose CFP, a novel 'material-centric' 'make-and-learn' framework, as a 'participatory pedagogical method.' That is creative, appropriate, nature-friendly, and simple to implement in schools at various stages identified in NEP2020, supporting global Sustainable Development Goals.

Keywords - Creativity, Innovation, Make and Learn, Cocoon Finger Puppets, Handmade-Toys, Participatory Pedagogical Method, Education, SDGs,

1. Introduction

Despite being complex, 'Creativity' has gained much traction in educational discourses (Patton, 2023). In general, there seems to be a consensus on the characteristics of creativity and agreement on it being new with some value and that everybody can be creative to some extent (Runco and Jaeger, 2012). Many innovative teaching methods, including toys and activities, have been harnessed to foster creativity. Puppetry proved to be effective in this context ((Mehrotra et al. (2009), Dunst (2012) and (Bernier and O'Hare 2005)). But the traditional repertory of Puppetry still essentially serves religious propagation. The conventional practices no longer appeal to the new generation's audience and are the reason for their decline. Modern forms of entertainment like cinema, television, and web-based media infinitely streamed through various platforms have captured people's attention. Contemporary forms of entertainment serve commercial, cultural, and political communication and consumption. Such influences have altered the indigenous Puppetry forms, transforming them for

secular and educational purposes (Brandon, 2023). The article explores the potential of 'Silkworm Cocoons' (Bombyxmori L.) as the primary material for creating finger puppets and aiding the teaching process at the preschool stage (Ahlcrona, 2012), employing a participatory method (Hedges and Cullen, 2012).

Finger puppetry, a kinaesthetic activity, would be ideal for foundational and primary stages. Due to their ease and less effort, they are preferred handcrafts among parents, children, and educators; however, making and using puppets are sporadic in educational practices. We piloted a study to check the feasibility and demonstrated the other possibilities of creating simple and complex characters. It would be an inventive learning method supporting mediating interactions in elementary educational stages, offering authentic and experiential learning opportunities for educators and students to improve skills, imagination, and collaboration. The paper's second section, covering puppetry's historical and modern significance, leads to the third section, which deals with the participatory pedagogical method and learning theories. The fourth section describes the methodological process that advocates a 'material-centric' make-and-learn framework, which is creative, appropriate, nature-friendly, and simple to implement in the classroom setup. The fifth section, discussing the results, concludes with the proposition for a novel material-centric pedagogical approach and framework.

2. Historical Significance of Puppetry: A Literature Review

The visual and performing arts are expressions of distinct cultures and geographies they represent. Eclectic forms of arts and crafts can be traced throughout recorded human history. We know little about the origins of puppetry; we can only hypothesize about the milieu that motivated our ancestors to use puppetry. Common traits and strong parallels between traditional art forms and regional Puppetry are typical as they imbibe similar attributes worldwide. Unlike in Europe, it is still a living tradition in Asia (p.69) (Orr, 1974). For instance, over twenty such puppetry traditions can be traced in India. Noted are 'Hand Puppetry' (*Punch & Judy type),* String Puppetry (*Marionette*), Rod/Stick Puppetry, and Shadow Puppet Theatre (Foley and Pudumjee, 2013). Hand puppetry is believed to be the oldest form due to its simplicity and is found across Asia (Orr, 1974)—the 'Bunraku Puppet' of Japan roots glove-type puppets (Foley and Pudumjee, 1974). Puppetry amalgamates many artistic domains like painting, sculpture, movements, music, space, light, costume, and accessories. At its core, Puppetry is the art of transforming an inert object into life; the diverse puppet practices have been painstakingly documented (UNIMA) from various regions. Over the years, these were integrated into folklore worldwide. The earlier Puppetry practices were usually an open-air affair commonly practiced in India, Indonesia, and Japan; ordinary village folks believed it was 'auspicious' and effective in escaping droughts, bringing rain, and warding off evil spirits epidemics (p.98)(Iyer, 1960). As Bascom lists,

"[T]he four traditional functions of the Asian puppet theatre are (1) The magico-religious, (2) The educational, (3) The reaffirming of cultural and social institutions, (4) The reinforcing of traditional ethics and moral standards", (p.79) (Bascom, 1954).

Since time immemorial, Puppetry has been a crucial vehicle for religious propagation and entertainment. The inclinations of iconographical traditions in 'Hinduism' might have prompted celestial and demonic manifestations to develop a rich tradition of sculpture that has long been turned into puppets. Archeological evidence reveals several pre-historic (*c. 2500 BCE)* terracotta artifacts*"with moveable limbs (Mechanical Dolls); the toy cow with a moveable head was found at the Harappa"* (Basham, 1959), and recorded that

"The ritualistic use of human and animal figures predated the Vedic Aryan culture and continued on the subcontinent until idol worship became characteristic again of the later Hinduism (from about the 8th-century CE)" (p. 21) (Basham, 1959).

Discoveries in Egypt revealed that puppets were created more than 3,000 years ago. Foley &Pudumjee(Foley and Pudumjee, 1974)indicated that the Indian epic 'Mahabharata' is the oldest reference to puppetry, which can be traced in the oral stories of the 9th Century BCE that got into the written format in ca. 4th Century; Panini and Patanjali works have mention of Puppet conceptions. Richard Pischel (*1849-1908*), a German scholar, emphasized Indian Puppetry and contended that *"India was the origin of Western puppet traditions"*(Foley and Pudumjee, 1974). The traditional forms of Puppetry enacted stories from epics and Puranas, besides fables and local tales. The known stories and memories are reinforced through simple performances that recharge communities' spiritual and moral values. The figurines might have moved hearts and minds through the dancing shadows, gestures, and repeated patterns. The captivating audiovisual storytelling medium survived the test of time and is still relevant. Recent trends to keep up with changing audiences include references to popular media, women in newer roles, themes on corruption, awareness, Family planning, and ecological concerns (Khan et al. 2023), (Babu, 2020). Asher (2009) referred to *"Radical Puppets as a powerful tool to voice current social issues."*

Similarly, Chattopadhyay (Chattopadhyay, 2017) accepted Puppets's potential in mass communication in India. Puppetry breaks down all barriers and directly reaches people and society (Khan et al. 2023). Mehrotra et al.(2009) also ascertained the appropriateness of Puppetry in the multicultural Indian context due to its inclusive and collaborative nature. More recently, Aravind et al. (2015) attempted to rejuvenate this age-old technique and storytelling medium by automating sections of puppet theatre. They employed 'Robot Puppet' manipulators and custom-designing software to give the ancient practice a modern and technological life—an example of a novel approach to interactive Puppetry.

2.1. Puppets in Therapy

Health professionals and researchers have used puppets with children in therapeutic practices. These simple, inexpensive approaches have been effective since the 1950s (Howells and Townsend, 1954). Kurt &Seval (2021) highlighted that Finger puppet plays could effectively be a non-pharmacological aid to decrease postoperative pain in children. Puppet experiences were employed as a healing strategy to familiarize elementary school children with aspects of wellness (Synovitz, 1999), education (Aldiss, 2009), and research (Measelle et al., 1998). Reid et al. (2014) used Puppets as part of the educational framework of undergraduate nurse education programs 'Pup-Ed' (*KRS Simulation*).

2.2. Puppets in Education

Krögera and Nupponenb's (2019) comprehensive literature review on *"Puppet as a pedagogical tool"* complements the aim of this endeavor. They found five potential applied uses of Puppetry in education; they are *"(1) generating communication, (2) supporting a positive classroom climate, (3) enhancing creativity, (4) fostering cooperation in and integration to a group, and (5) changing attitudes"* (ibid.). Similarly, Measelle et al. (1998) describe:

"[P]uppets pedagogical value may be highlighted when combined with children's ability to dramatize, freely express feelings and emotions, creativity, and self-knowledge... Children observed and remembered facts, imitated them, and added personal characteristics and experiences to what they observed" .

Puppets act *"as transitional objects linking children's inner and outer worlds"* (Bernier and O'Hare 2005)). Furthermore, Riyani (2019) used finger puppetry utilizing storytelling techniques to teach vocabulary to the fifth grade and found a correlation between children's development of ideas and concepts and their initial formal schooling experiences. Romanski (2019) states, "*The complexity of form in puppetry allows for play, discovery, imagination, problem-solving, brainstorming, collaboration, and innovation*." Brèdikytè (2000) introduced "the DDP (*Dialogical Drama with Puppets*) method" to promote child-teacher interaction. Puppets could also boost the confidence of the novice teacher by using them "*as a type of cover"* (Remer and Tzuriel, 2015). Marshall (2014) advocated for integration and framing art as a transdisciplinary paradigm to meet the current needs of education. Performing arts such as Puppetry has also been a productive method in informal education in India (Shah and Joshi, 1992). In earlier attempts, artistic shows were arranged for developmental programs (Littlepage, 2006). It helped the audience to be receptive to the new programs due to their metonymic (Tillis, 1992) and liminal properties (Delanty, 2009 and Turner, 1994).

2.3. Barehand Puppetry (Hand Shadows), Make-up hands, Finger Puppetry

Violette recollects hand shadow works of Mario Mariotti, like Animals *(1980)* and Hu-mains *(1982),* and acknowledges Make-Up Hands' tremendous possibilities of Bare Hand Puppetry (Violette and March, 2009). The finger puppetry type is relatively modern and less explored than traditional forms. As the name suggests, the Puppet is animated using one or two fingers occupying the Puppet's interior (Finger puppet - Wikipedia); the Puppeteer's fingers constitute the prime form of manipulation (Violette and March, 2009). Finger puppets could also be created simply by placing the ball on the tip of the finger. Sergei Obraztsov similarly performed a number with two characters, and FrédéricO'Brady used a bare-hands puppet with a simple head attached to the index finger (Jarovtseva, UNIMA). Jean-Paul Hubert has performed puppet plays by simply reciting the text as a voice-over and illustrating his interpretations with simple finger puppet manipulations (Jarovtseva, UNIMA). Due to their ease and less effort process, these are favourite handiworks among parents, children, and educators of current times; such well-crafted or industrially manufactured finger puppets are also commercially available with educational kits and often come in a set of 5. They are designed to fit all fingers of one hand. However, imaginatively creating puppets for the given context is invaluable.

2.4. Silkworm Cocoons and Present Usage

The cocoon is formed in distinct shapes, textures, and colors depending on the racial features of the silkworm breed. 'Indian silks' are renowned for their artistic sophistication, designs, and distinctive colors (Vikaspedia). India is "the second-largest silk producer of raw silk and the world's largest consumer of pure silk." Since independence from the raw silk production level of *1,437 MTs* during the first *'Five-Year Plan'* period to *31,831 MTs* till 2018, and planned to augment to *48,800 MTsby* 2023-24 (Vikaspedia). The Sericulture industry is banking only ~18-23% of silk filament wrapped around each cocoon (Mascarenhas and Suvidha (D'Source)),leaving the inner shell (~80%) unutilized, which unwraps an enormous opportunity to explore this unique natural material for its qualities and abundance. The cocoons are perfect for handcrafting, and there have been many attempts to use this humble material in value-added products like flowers, bouquets, garlands, Jewelry, and various other accessories (Mascarenhas and Suvidha (D'Source)).

2.5. Cocoon and Finger puppetry

The cocoons are pierced at one end while extracting silk in the Sericulture process, creating a small opening. The oval shape and natural form of the Silkworm cocoon allow us to insert fingers into them, complementing the idea of 'Finger Puppetry.' The plain light surfaces are excellent for creating rich surface details by drawing. Prihatin et al. (2018) investigated learning outcomes in biology subjects using Brain-Based Learning, applying role-play through Finger Puppets made of cocoons. However, the activity did not extend its scope to the design development process. Also, the authors did not use them as the primary resource material or propose a comprehensive educational approach that can aid across age groups, subjects, and skills. We have attempted to create and demonstrate exciting characters and discover the possibilities of CFP in pedagogical practice. This paper complements the earlier attempts to use finger puppets in education (Riyani, 2019), (Romanski, 2019) and the use of the cocoon as material in an educational aid Prihatin et al. (2018) and proposes a prospect as a generalized participatory pedagogical method (PPM) for educators and learners alike.

3. Participatory Pedagogical Method and Participatory Learning Theories

Scholars have urged alternative and coherent theoretical frameworks for developmental psychology that underpins culture in learning, Burman (2001) cited in Hedges and Cullen (2012). Most scientific studies are devoid of sociocultural dimensions and historical contexts. A more recent understanding of the developmental stages informed by the research in natural contexts acknowledges the role of culture and social values, suggesting cultural psychology as an alternative (Vygotsky, 2012). Vygotsky's early seminal work (1934) explains children's learning of simple concepts without any formal or explicit instruction just by participating in the experiences, a critical concept in play, in puppet creation and usage. Further, it affirms Vygotsky's idea that learning should be authentic and relevant to the daily life of the child, its community, and its culture. In Vygotsky's view (Vygotsky, 1978), sociodramatic plays have been the primary sources of learning. The elements of the imaginative and symbolic nature of play assume the thinking, emotions, actions, and language of the roles they are enacting. Though Vygotsky is credited for being a proponent of the cultural dimension in child learning, he did not claim this (Cole and Gajdamaschko, 2007)

According to Wells (2008), teaching-learning is inseparable and occurs through co-creation in a joint activity with cultural artefacts. The Participation Plus model (Hedges and Cullen (2012)) of pedagogy also acknowledges that creative learning and knowledge building occur through active participation in complex cultural activities. The common feature of Participatory Learning Theories (Hedges and Cullen (2012)) that built upon this understanding imbibes observation, participation, Language, Dialogue, and learning construction. In this context, the Participatory Pedagogical Method (PPM) complements the PLTs in action mediated by the facilitators. Puppetry is a cultural practice, and creating puppet characters promotes learning as a dynamic pedagogy. That involves co-construction, dialogue, and belonging: incorporates knowledge, attitude and skills and comprises constructs such as 'dispositions,' 'funds of knowledge,' and 'working theories.' Hence, the proposed participatory pedagogical method, at least in the foundational and primary stages where the educators and students create the characters or enact them using the narratives rooted in the immediate context that are ontologically different from what is in practice. For example, students learn without a clear objective to apply their creation or complete the activity in isolation from the context it is created for.

4.   Methodology

The initial feasibility study was piloted to determine how children under age seven respond to the material-centric (Silkworm Cocoon) activity—the feasible method to understand children's participation in academic practice. With the class teacher's coordination at '*Novus: Early Learning*

Centre' in Bengaluru, Karnataka, twelve students aged between 3.5 and 6.5 were identified with parents' consent. However, two kids did not turn up on the day, and one child chose not to do anything, with 9 participants (Six girls and three boys) participating in the activity. Of the nine, two kids just played with the cocoons, inserting fingers without drawing any details (Fig 1) on them. The cocoons used in the study are (*Bombyx Mori/ Bivoltine*), a locally available type sourced from a local cocoon market. The pilot study was qualitative and conducted remotely through the Zoom VC platform. The activity spanned 45 minutes at the above-said venue. The outcomes were used in performance (Coordinated by the instructors), weaving all characters (Fig 2) in an impromptu narrative. The data was gathered primarily from observations and visual documentation as per the instructions given to the teachers. The kids' drawings and the CFP-making process were video-recorded and photographed for the observational study. The children's demographic information, anecdotal experiences, and suggestions from class teachers were collected.

4.1. Design and Procedure

The recordings were transcribed to elicit spontaneous reactions from the children. The participatory approach included simple prompts like "*Who is your favourite person?"* "*How does she look*?" or "*Can you draw her*?" are used to induce making. The conscious choice was not to have pre-decided parameters like in the study(Sparapani et al. 2013) or suggest any prescriptive steps. We tried to look through such a lens "to conceive a process without predetermination" and engage younger children freely (Bretherton et al., 1990). We employed the "mosaic of techniques combining the visual with the verbal means," as advocated by Clark el. al. (2003). Moreover, while focusing on younger kids (3-7), we tried to engage them in the present continuous tense (Gallacher and Gallagher, 2008), which required an 'ontological shift' in that the authors offered reflections, debunking some implicit assumptions about the participatory approaches involving children and critically viewing the usefulness of 'participation' as a framework. Punch (2002) also suggested that children should be understood as "autonomous individuals" and encouraged to participate 'actively' rather than 'passively responding in an activity.'

Based on the observations, insights from the literature review, and teachers' observations, an exploratory design development process of CFP was carried out after the study to demonstrate the possibilities (Fig 10) of implementing a similar activity across the educational levels. We used the same type of cocoons in the DD process as the pilot study. Other stationery materials like water-based gum, poster color, markers, cutters, and scissors were utilized. The natural woollen thread and the silk floss scrapped from the surface of the cocoons are also used in making hair and other details (Fig 3). The cocoons are ideal for iterative processes and best suited for large-scale applications as the waste generated is minimal and nature-friendly. The process involved sourcing cocoons and other materials for creating puppets, identifying or creating suitable characters around the themes, visualizing and developing characters by simple line drawings, and crafting details on cocoons (Fig 4, 5, 6). The content for the puppet performance can be elicited from the existing children's literature. Alternatively, the instructor can also create them around the topic of teaching. The verbalized narrative could be enacted, animating with gesticulations of real-life characters with modulated voices. It could be an innovative learning method supporting and mediating interactions.

Few theme-based puppets were made to engage the kids in conversations (Fig 7, 8, 9). The Puppet could be formed using a single finger resembling the body, with a simple oval head stuck on the top or an accessory made of a cocoon. For example, a pointing finger is used for the body, and the adjacent thumb and middle finger become hands, leaving the rare two fingers to form folded legs. Alternatively, each finger could constitute a personality complementing the narrative between two

or more characters. Such a performance, where a single hand becomes an entire theatre, and the palm becomes the stage on which the concert appears. Multiple fingers can also be operated on each hand, letting the performer control many puppets simultaneously as a family of human figures, a crowd, a camp of animals, a zoo (Fig 10), or distinct characters used together in the choir or the story. The cocoons could also be employed as footwear where an inverted hand with a pointing finger and middle finger wearing the shoes and thumb and ring finger can act as right and left hands, respectively.

5.   Results of the pilot study and discussion

The pilot study used locally sourced cocoons. Unlike the 'readymade' toys, the sheer experience of the exotic material was remarkable and well-received. Kids intuitively inserted fingers into cocoons and started waving them. Gallacher and Gallacher's (2008) study recorded that "*children [were] acting in unexpected ways: appropriating, resisting or manipulating our research techniques for their purposes.*" We had a similar experience; a few slightly older (5-7) kickstarted exploring the material.

In contrast, others observed their peers and started exploring. The youngsters could not draw on Cocoons; however, they started drawing on paper with simple prompts and happily wore cocoons and owned them satisfyingly. Children attempted to develop the characters of their choice using the available markers and showed them to their peers and teacher. The puppets' characters represented their teacher, mother, sister, and brother. In one case, on both hands, two different people and subjects like 'Santa Clause' and 'Christmas tree.' Identifying the characters, naming them, speaking to them, or on behalf of the character were spontaneous. We observed the children engrossed in the process of explorations. Puppets could moderate their thoughts and elicit a qualitatively distinct response from kids of different ages. Puppetry proved to be an effective tool to improve communication and narrate concepts, increasing students' enthusiasm and learning outcomes in education. The natural material-based CFP would be an ideal aid at foundational and primary levels of education. That offers a tangible, experiential opportunity for a fascinating teaching-learning process across age levels in varying complexity. Hence, the objective of the design explorations is to ascertain the potential of CFP as one of the educational possibilities where the participation of both the maker and teacher blends. However, we recommend a few categories of age-appropriate activities, keeping the complexity of making CFP while the pedagogic explorations are planned.

The activities meant at the age (of 3-5) could have simple drawing activities on paper and then on the fingertips. Later, the instructor could transfer these creations to the cocoon surface, helping the kid retain their ownership and see them animate. In our experience, the students in this age group are still very raw and imaginative; hence, the teacher could make and demonstrate the characters and use them as props, supplementing the existing children's literature. (The DD process undertaken is aimed at this age segment as a broader reference) The second category of children aged between 5 and 7 could be encouraged to make the characters of their choice autonomously or slightly older, 8–10 years on the existing stories with more details and embellishments. The hands-on activity helps them experience the material and making process. (E.g., Fig 4). The third segment of 10-13 could be encouraged to conceive a narrative and make the characters (E.g. Fig 10) perform individually or in groups for their fellow schoolmates. In addition to the above, young adults aged between 13 and 18 can design a mobile stage and perform among interschool and inter-regional platforms like "Kala-Utsav".

5.1.   Limitations and Future Potentials

The DD exercise made us realize the infinite possibilities of utilizing Cocoons. Due to the pandemic, the pilot study was remotely conducted on a small sample of nine urban-centric children under seven. The pilot study revealed this method's vast strengths and few limitations. Its diverse applications in age-appropriate activities in education are the scope of future research. However, the proposed CFP being a material-centric pursuit, the accessibility of raw material might be limited at places where Sericulture is not in practice. Though the cocoons are available commercially through e-commerce services, the remotely located schools are disadvantaged. The inexperienced and untrained instructor could also impede the full potential of this method since these activities demand unique skills and motivation. According to the 8th AISES report (2009), about 13 lack (1.3 million) "recognized primary, upper-primary, secondary, and higher secondary schools" exist in the country. Puppetry also has enormous potential to integrate into teacher education. Most states of India boast high yields and consumption of silk varieties that can utilize cocoon shells creatively in their pedagogical practice. The creative and naturally appealing small puppets could be made and carried to any place and stored safely in a small container.

6.   Conclusion

The kinesthetic nature of 'Cocoon Finger Puppetry' is an ideal educational aid, and the participatory approach to pedagogy is the most appropriate method at foundational and primary levels of education. Puppets being a 'toy' is both a strength and a weakness. At one end, it could connect diverse fields, such as art, culture, science, technology, communication, media, and ecology, and it might end up being only a fun activity without much thought on its usefulness. The simplicity of CFP allows the blending of fact and fiction, curiosity, and reflection. After extracting silk yarn, the Silkworm cocoon shells are unusable in the sericulture industry and could lead to an unmanageable byproduct ending up in landfills. However, this material is ideal for small, large-scale, and iterative pursuits and demonstrations, generating minimal waste and being nature-friendly. Making and using puppets are sporadic in practice, pedagogy, and publications. The puppets provide enjoyment and fun and stimulate curiosity and conversation. The excitement and the imagination that the making process offers are invaluable. The potential designs and possibilities of handmade toys and characters are demonstrated and documented for use and broader reference—the present paper aimed at the feasibility study in the pre-primary/foundational stage educational context. The second part is the design development process that we conducted, keeping the primary, secondary, and higher secondary stages requirements based on the educators' insights gathered in the discussions. With this background, acknowledging the limitations of the present work, we urge Policymakers, design researchers, and academics to nurture newer explorations in the creative educational ecosystem while preserving and promoting cultural and folk forms that have much to offer to education.

Ethical consideration: The Design Development process did not involve children/human subjects and conformed to the (Level-I) 'IEC- provisions. The pilot study qualified as Level-2 and was excused from IRB-IIT Bombay review, as the only risks of harm to participants posed are 'informational risks.' Hence, the parents were informed about the research aim, ensured the confidentiality of all data collected through the class teachers, and confirmed its future access after the academic scrutiny.

Acknowledgment

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Figures

Fig 1. Few outcomes of the pilot study conducted @ Novus, Bengaluru, on 23rd Dec 2021

Fig 2. The class performances using some of the outputs from the children @ Novus

Fig 3. The material used in the Design Development process

Fig 4. The output of the Design Development process (Christmas theme) that appeared in the Pilot study

Fig 5. Characters with hair attached, The output of the Design Development process.

Fig 6. The output of the Design Development process (Birds and animals)

Fig 7. The output of the Design Development process focusing on Panchatantra tales (Rabbit and Tortoise)
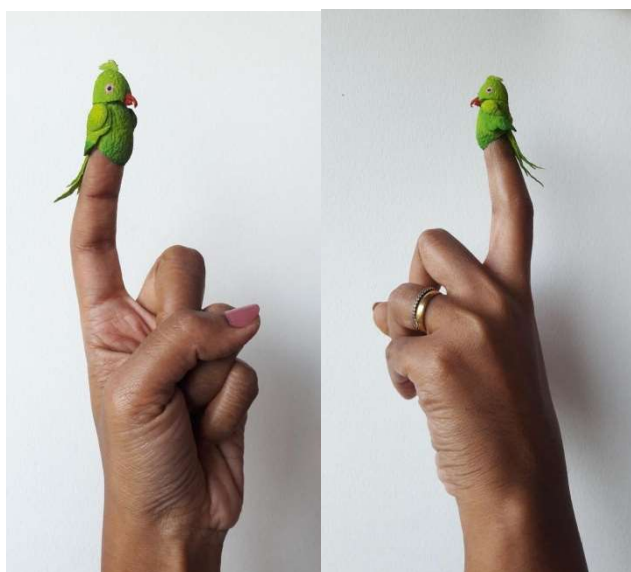

Fig 8 and Fig 9 The output of the Design Development Process (Parrot Story)

Fig 10. The Summary of the Design Development Process and Output (1)

Fig 11. The Summary of the Design Development Process and Output (2)

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