

## Size Adaptive Apparel that grow with the ‘Growing ones’

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### ABSTRACT

The paper aims to develop size adaptive apparel that supports sustainability goals. The study is based on designing extendable clothing that can grow along with the child's growth and can be used over multiple ages. Devising such clothing to tackle the fast outgrown and sizing issue in children's apparel. This will bring a worthwhile and positive change to consumer's shopping experiences, especially as parents who face challenges in finding garments compatible with their children's proportion and are adaptive to fit various body size and types. The study was conducted using a survey method in which a total of 100 respondents were approached to know the preferences of mothers for their children's clothes. Convenience sampling was used to select mothers having child that falls in the age group of 0 to 6 years. Descriptive statistics such as frequency and percentage were used to analyse the data. Fifteen garments were designed keeping the extendable component. Evaluation of 10 designs was done by academicians and industry experts. The most preferred three garments were created for children of 2 to 6 years and acceptability was evaluated by the mothers. The study recommends to mass produce such clothing and bring easily accessible in the market. This will also cater to the need of sustainability.

Keywords: Size adaptive apparel, kids apparel, extendable clothing, outgrown clothing, sustainable apparel

### INTRODUCTION

In today's society, resources are consumed in a large amount and therefore, endless new products are available. As the children's ready to wear industry was becoming popular, more and more fashion designers focused exclusively on designing clothes for young children and babies. Soon, the offer became more and more diversified, supermarkets and clothing stores began to fill up with colourful clothing articles for children, lots of shops even specializing in exclusively selling children's clothes opened.

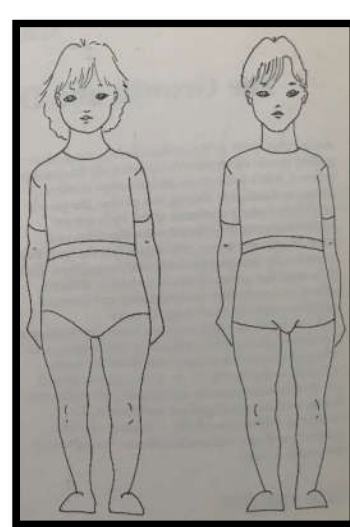
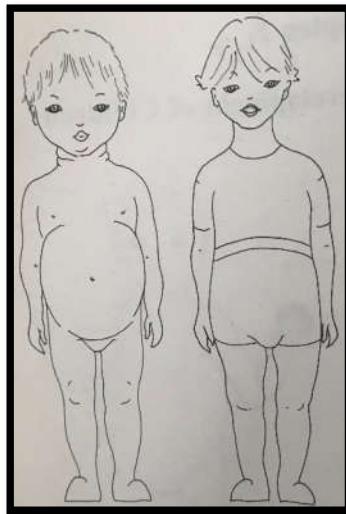
Children's clothing is a new trend nowadays. The kids wear sector is a major part of the textile industry and is growing faster day by day. Children nowadays form an important segment of clients in the fashion industry, enjoying an extensive and varied range of clothing according to their age. Indian parents are becoming more brand conscious, educated and aware of baby health, and quality seekers. They are influenced by the western culture along with the increased disposable income, is one of the major reasons for the growth of kids apparel market in India. Clothing waste is a concern for children wear. The babies and toddlers are grown up fast. Their clothing size is constantly changing. Growth is one of the biggest challenge for parents when it comes to dressing kids. In fact, some clothes are never worn. According to a study conducted by Évéea (2019), 64% of babies' clothes are not stained, not damaged, or worn, and instead they could be used by others. Moreover, many clothes are lightly stained and ended to landfill sites. Kids grow up an average of 6-7 sizes in their first 2 years. ([www.dogonews.com](http://www.dogonews.com))

The main physical characteristics of children's different age groups are:

- **Baby:** - The first year is a period of rapid growth dominated by the lengthening of the trunk and the accumulation of subcutaneous fat, and body form is characterised by a large head, heavy trunk and protuberant abdomen. There is a general chubbiness and the upper part of the body is proportionately longer than lower. Typically, the lower limbs of a baby are approximately one-third of the total body length, whereas in the adult, the lower limbs comprise about one-half of the total height.
- **Infants:** - The physical growth and development are not as dramatic during this period as that achieved during the first year. Growth rate slows considerably, and whilst the birth weight is generally quadrupled by two and a half years of age, the incremental increase in half years of age, the incremental increase in height is lower than that during infancy. On average, adult height is about twice the child's height at two years of age. After the second year, the chest girth exceeds that of the abdominal girth, which together with the growth of the lower extremities, gives the child a slightly taller and leaner appearance. However, children in this age group still remain a squat, pot-bellied form because of the less well-developed abdominal musculature and short legs.
- **Children:** - In relation to the first three years of life, physical growth slows down and begins to stabilise during this period. The height increases by 6cm to 7cm per year and generally occurs in the elongation of the legs rather than the trunk. Bodily

proportions no longer resemble those of the infant, and the pre-school child is slender but sturdy with an erect posture. At this period, there is very little difference in the measurements and proportions of boys and girls. (Gerry Cooklin)

Inspired by the problem of short-lived kid's clothes, this study is done to design garments that could grow along with children. Parents can see their children grow without worrying about running out of sizes. Extendable clothes are designed so that children can wear them for longer and provides a flexible fit within the same age group. Resizable clothing make the outfits durable for a longer period of time. Adjustable clothing requires smart design and construction techniques at the manufacturing stage. For parents, the biggest merit of adaptable clothing is its cost-effectiveness. This also supports sustainability goals.



**Figure 1.1.**

**Baby**

**Figure 1.2.**

One year old Two year old

**Infants**

**Figure 1.3.**

Four year old

**Children**

**Source:** Pattern Grading for Children's clothes- The technology of sizing by Gerry Cooklin

**Rationale of the study: -**

This study focused on developing extendable clothing for kids wear that adapted to size changing of children. Present study will promote slow fashion and spread the message of 'longevity'. This will also contribute in reducing carbon footprint and environmental hazards. The biggest advantage of extendable clothing is its cost-effectiveness. The study will

examine consumers' acceptability and usability of such extendable garments for their children.

It is on the basis of above context that the present study has been planned.

### **Objectives: -**

The main objectives of the study are:-

1. To find the preferences of mothers towards clothes of their children.
2. To design, construct and find the acceptability of the constructed extendable apparel for kids.

### **Limitations: -**

- The study will be limited only to unisex kids wear.

## **LITERATURE REVIEW**

### **Designing**

Aflatoony (2020) aims to explore techniques for creating size adaptable clothing for kids that can grow along with the kids' growth and can be worn over multiple ages. This research focus on the United States children's wear size and to generate body adaptive garments to fit different shapes. The author believes that the diversity of children's growth patterns are related to infant's feeding, geographical region, and urban versus rural location. The objective of the study was to explore parental need for an adaptive garment for their children, to explore parent's views on the concept of adaptive garments, and to determine the idea of sustainable consumption attitudes and shopping experience. Final objective was to create sample garments for testing. Both quantitative and qualitative methods were adopted and survey questions were organized. The research was conducted in Child Development Laboratory and 25 parents answered the online questionnaire. The results showed that only 30% purchased exactly the same size/age garment for their child. The rest stated that they purchase one or more than one size larger to best fit their child's body structure. The majority of parents stated that they would like to increase the life of their child's garment due to economic concerns, sustainability and better fit. The researcher implemented adjustment techniques in garments and did a feedback process.

Pargai, Gahlot, Rani (2015) states that India has 20.2 lakh disable children aged between 0 and 6 years (Census 2011). There is a shortage in the marketplace of specially designed, functional clothing for disabilities. WHO report of 2012 describes Disabilities as an umbrella covering impairments, activity limitations and participation restrictions. Clothing for disable children require both functional and aesthetic features. Functional features give more independence in dressing and more self-sufficiency in day to day activities. Aesthetic features distract attention from disabled part and also provide psychological satisfaction to the wearer.

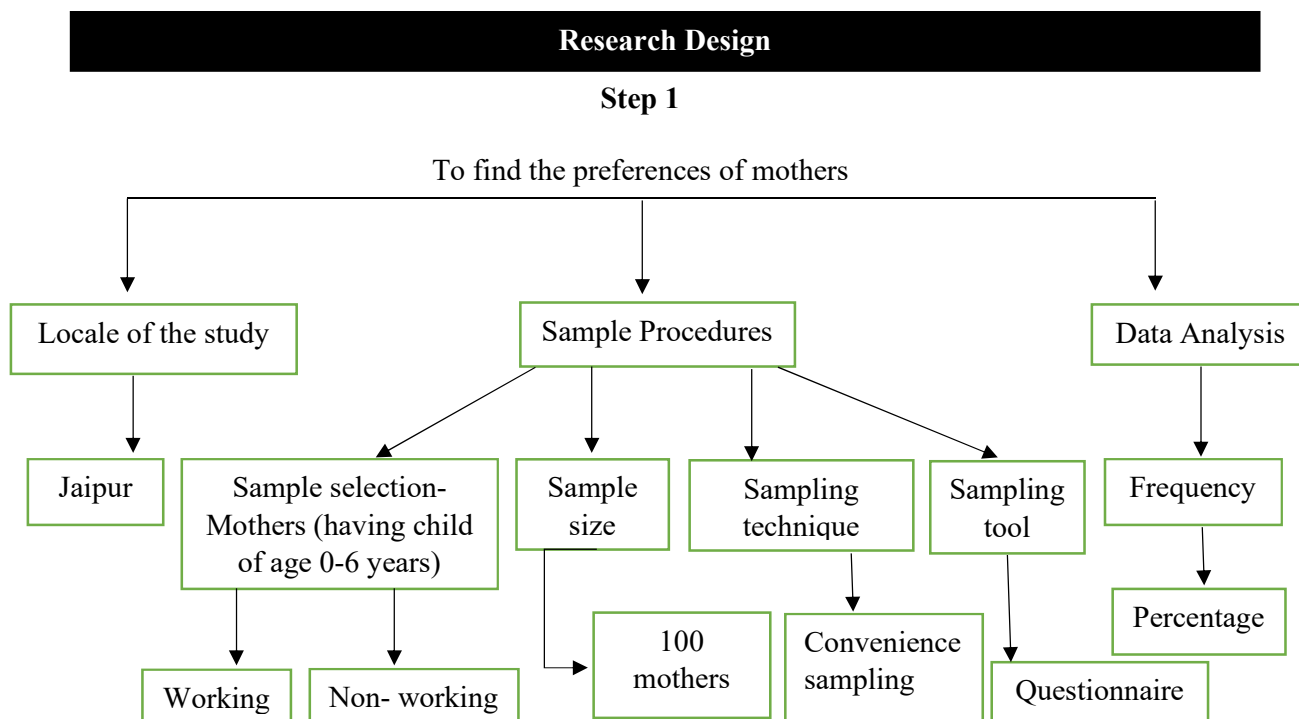
The objective of the study was to design and develop functional winter clothing for children with paralysis of hands and legs. Personal interview was scheduled using questionnaire to assess clothing requirements of 1 differently abled child. 2 designs were made out of which 1 was constructed and given to the child for wear trial. The researcher found the designed and constructed garment to be highly suitable with the suitability level of 2.66.

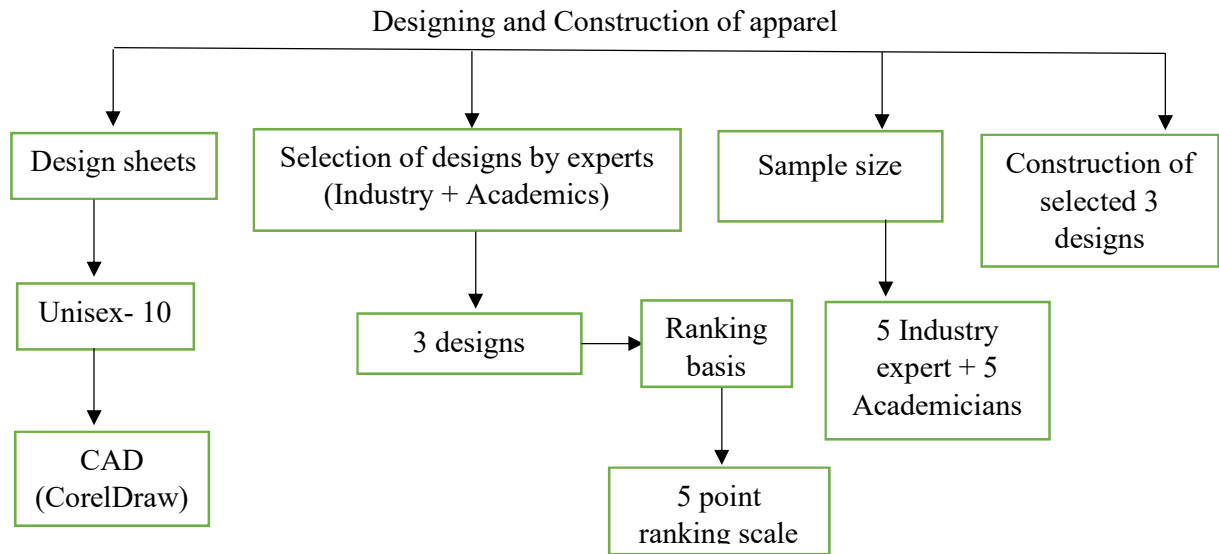
**Consumer Behaviour**

Rajvanshi and Mittal (2019) describes that consumers choices are changing and functional fabrics are demanded higher. Mothers want clothes that are comfortable and hygienic. “During the development of curative kid’s textile products, all stages of processing were done in a natural way” (Chandrasekaran et al., 2012). According to the authors, the antimicrobial property of fabric finish is considered more important for kids’ body. The study focussed on types of fabrics used in kid’s garment, preferences, health problems caused by clothing and knowledge about antimicrobial finish. A pre-designed, pre-tested and structured schedule was used to collect data from 200 mothers of Udaipur district. During interview, the various aspects of hygiene and health problems were asked, which include knowledge, attitude, perception and practice. The researchers concluded that the mothers were so concerned about their kid’s healthy and hygienic clothing. The study showed that 98% mothers were worried about toxins in clothing, 88% woman were interested in accepting eco-friendly clothing and 93% mothers demanded antimicrobial kids clothing.

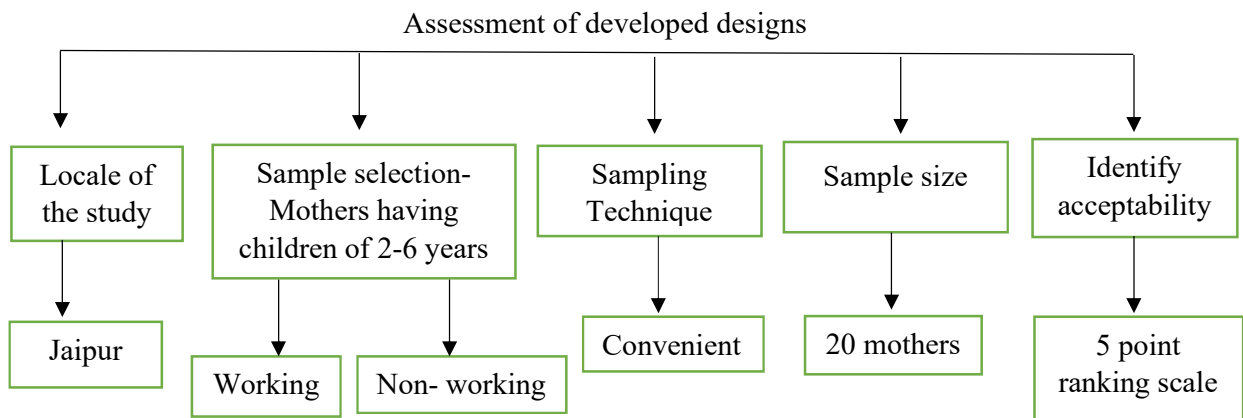
**METHODOLOGY**

Methodology is a scientific way of conducting any research as far as that study is reliable and conducted with accuracy. It involves three different steps: -





**Step 3**



**Step-1**

**I. To identify the preferences of mothers towards clothes of their children**

- i. Selection of Locale-** The area for data collection in the present study was restricted to Jaipur.
- ii. Sample procedures:**
  - a) Sample selection-** The respondents in this study were mothers of children 0-6 years. The selected mothers were both working and non- working mothers.
  - b) Sample size-** A total of 100 respondents were selected.
  - c) Sampling technique-** A convenient sampling technique was followed for selecting respondents from Jaipur.
  - d) Sampling tool-** Questionnaire was used to collect the data from mothers.

- iii. **Data Analysis-** After data collection, the result was analysed using frequency and percentage.
- iv. **Preparation of tool-** Questionnaire was used in view of the objectives of the study for the collection of data. The questionnaire consisted a set of close ended and open ended questions to fulfil the objective. The questionnaire for the mothers contained demographic details such as name, age, family size, occupation, annual income, education. The questions were number of children and their age, fabrics and designs preferred by them, preferred price range, etc. Further, focus was made on preferred fabrics, colours, prints.

## Step-2

### II. Designing & Construction -

The design and development process included design forecasting i.e., preparation of theme and mood board, colour board and fabric swatch board, design sheets, sourcing material, specifications sheets (spec. sheet) and cost sheet drafting, adaptation, cutting and sewing the outfits.

- i. **Design sheets:** - At least 10 design sheets were made under unisex category.
- ii. **Selection of designs:** - Out of 10 designs, 3 designs were finalised. The selection was done by the industry and academic experts on ranking basis using 5 rating scale.
- iii. **Construction:** - 3 most preferred designs by the experts were constructed.

## Step-III

### III. Assessment of developed designs-

The constructed garments were assessed to check acceptability.

- i. **Locale of the study-**The selection of the locale for data collection in the present study was restricted to Jaipur.
- ii. **Sample selection-** Mothers having children of 2-6 years were selected following convenience sampling method. The respondents of this study consisted of both working and non- working mothers.
- iii. **Sample size-** 20 mothers were selected to check acceptability of the constructed apparel.

**Acceptability-** Ranking scale was used to identify acceptability of the constructed apparel by mothers.

## RESULTS AND DISCUSSION

The data analysis and results are in accordance of different objective which are described and discussed under the following heads:

- I. Preferences of mothers towards clothes of their children
- II. Designing, construction and acceptability of the constructed extendable apparel for kids.

### I. The preferences of mothers towards clothes of their children

**Table No. 4.1.1**

*Number of children*

N=100

No. of children	Frequency	Percentage
1	55	55%
2	38	38%
3	4	4%
More than 3	3	3%

Table No. 4.1.1 represents that 55% of respondents have 1 child, 38% of respondents have 2 children, 4% of respondents have 3 children and 3% of respondents have more than 3 children.

**Table No. 4.1.2**

*Age group of child*  
N=100

Age group (in years)	Frequency	Percentage
0-2	24	24%
2-4	41	41%
4-6	35	35%

Table No. 4.1.2 depicts that 41% of the children fall into the age group of 2-4, 35% of the children fall into the age group of 4-6 and 24% of the children fall into the age group of 0-2.



**Table No. 4.1.3***Preference of purchasing garments*

N=100

<b>Age</b>	<b>Frequency</b>	<b>Percentage</b>
Ready-made	88	88%
Custom made	12	12%

Table No. 4.1.3 shows that 88% of the mothers prefer purchasing ready-made garments while only 12% of the mothers purchase custom-made garments. Majority of the mothers prefer ready-made garments because of the variety of brands, design range and availability of their preferred apparel. The one reason behind this is that most of them are working mothers and they don't have enough time for custom made apparel and some find custom made apparel expensive.

**Table No. 4.1.4***Satisfaction with the ready-made garments available in the market*

N=100

<b>Attitude</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	73	73%
No	27	27%

Table No. 4.1.4 represents that 73% of the mothers are satisfied with the ready-made garments available in the market while 27% of the mothers are not satisfied with the ready-made garments available in the market. The reason behind not satisfying with the ready-made garments available in the market is that they do not find designs and style of their choice. Size was the main issue that they mentioned, as there is a huge difference in size even in the same age group. Mothers do not find the perfect size for their kids and hence, are not satisfied with the ready-made garments available in the market.

**Table No. 4.1.5***Number of times for purchasing*

N=100

<b>Preference</b>	<b>Frequency</b>	<b>Percentage</b>
Once a week	8	8%
Once a month	32	32%

Every 3 months	39	39%
Every 6 months	19	19%
Once a year	2	2%

Table No. 4.1.5 depicts that 39% of the mothers purchase kids clothes in every 3 months, 32% of the mothers purchase kids clothes once a month, 19% of the mothers purchase kids clothes every 9 months and only 2% of the mothers purchase kids clothes once a year. The reason behind purchasing frequently is that the clothes run out of size so quickly. Children are constantly changing their size and this generates the need to purchase new and more clothes for them.

**Table No. 4.1.6**

*Money spend annually for outfit of a child*

N=100

Price range (in Rs.)	Frequency	Percentage
Below 5000	37	37%
5000-10,000	38	38%
10,000-15,000	18	18%
Above 15,000	7	7%

According to the Table No. 4.1.6, 38% of the mothers spend Rs.5000-10,000 annually for outfit of a child, 37% of the mothers spend below 5000 annually for outfit of a child, 18% of the mothers spend Rs.10,000-15,000 annually for outfit of a child and 7% of the mothers spend above 15,000 annually for apparel for child.

**Table No. 4.1.7**

*Preference for buying unisex clothing*

N=100

Preference	Frequency	Percentage
Yes	61	61%
No	39	39%

Table No. 4.1.7 represents that 61% of the mothers prefer buying unisex clothing while 39% of the mothers do not prefer buying unisex clothing. The result shows that majority of the mothers are buying unisex clothes which shows their thinking is changing with time. Unlike the earlier times, the belief to dress a child in a certain way according to gender has changed now.

**Table No. 4.1.8**

*Colour preferences for unisex clothing*  
N=96

<b>Colours</b>	<b>Frequency</b>	<b>Rank</b>
Blue	57	II
Black	59	I
White	36	III
Yellow	32	V
Red	33	IV
Green	13	VII
Pink	16	VI
Grey	5	VIII
Brown	5	VIII
Cream	1	X
Purple	3	IX
Orange	1	X
Nude	1	X

Table No. 4.1.8 shows that black is the most preferred colour by mothers for unisex clothing followed by blue, white, red, yellow, pink and green while cream, orange, and nude are the least preferred colours for unisex clothing followed by purple, grey and brown. According to the mothers, black, blue and white colours are considered best for unisex clothes as they can be worn by both boy and girl.

**Table No. 4.1.9**

*Preferred prints for children wear* N=100

Prints	Frequency	Percentage
Cartoon	29	29%
Floral	23	23%
Natural	38	38%
Geometric	6	6%
Abstract	4	4%

Table No. 4.1.9 represents the preferred prints for children of 2-6 years. The table shows that 38% of the mothers prefer natural prints for 2-6 year child, 29% of the mothers prefer cartoon prints, 23% of the mothers prefer floral prints, 6% of the mothers prefer geometric prints and only 4% of the mothers prefer abstract prints.

**Table No. 4.1.10**

*Preference for selecting fabrics*

N=100

Fabrics	Frequency	Weight mean score
Cotton	442	4.42
Linen	326	3.26
Rayon	300	3.0
Polyester	186	1.86
Wool	303	3.03
Silk	267	2.67

Table No. 4.1.10 depicts the preferences of mothers for selecting fabrics for their child. Cotton was highly preferred with 4.42 WMS, Linen was second most preferred fabric with 3.26 WMS. Wool, Rayon and Silk were less preferred with WMS of 3.03, 3.0 and 2.67 respectively. Wool was least preferred. The reason behind highest preference for cotton fabric is because it is lightweight, breathable, durable, soft and allergy free.

**Table No. 4.1.11**

*Disposal of the kids clothing when they run out of size*

N=100

Preference	Frequency	Percentage
Give it to someone you know	47	47%

Donate them	29	29%
Throw away	3	3%
Store for further use	19	19%
Recycle/Upcycle	2	2%

Table No. 4.1.11 shows the different ways used by mothers to dispose the kids clothing when they run out of size. The data depicts that 47% of the mothers prefer giving clothes to someone they know, 29% of the mothers donate the outgrown clothes, 19% mothers store them for further use, 3% throw them away and 2% recycle/upcycle the kids clothing when they run out of size. The majority of mothers give it to someone they know as they think that their child's clothes should be worn by anyone whom they don't know. Another reason behind this is the joint families where there are so many kids in their own family. Few of the mothers donate them which shows lack of awareness towards donation of clothes.

**Table No. 4.1.12**

Preference	Frequency	Percentage
Everything	33	33%
Only material/ trimmings in best condition	51	51%
Nothing	16	16%

*Attitude to save outgrown kids clothes* N=100

Table No. 4.1.12 depicts the attitude of mothers to save outgrown kids clothes which shows that 51% of the mothers save only material/ trimmings that are in best condition, 33% of the mothers save everything and 16% of the mothers do not save at all. The majority of mothers keep only best conditioned material and throw the rest of the material or give it to someone. Some of the mothers keep everything with them because they do not want to give away something which belongs to their kids.

**Table No. 4.1.13**

*Availability of extendable clothing in the market* N=100

Availability	Frequency	Percentage
Yes	42	42%
No	58	58%

Table No. 4.1.13 represents that 58% of the mothers have not seen extendable clothing in the market while 42% that of the mothers have seen such clothing in the market. Maximum mothers have not seen which is a reason to design and develop extendable clothing.

**Table No. 4.1.14**

*Preference for buying clothes that can be increased in size as the child grows* N=100

Attitude	Frequency	Percentage
Yes	93	93%
No	7	7%

According to the Table No. 4.1.14, 93% of the mothers are interested in buying clothes that can be increased in size as the child grows while 7% of the mothers are not interested in buying such clothes. This was a positive feedback from mothers towards extendable clothing. They want to buy such clothing because of its long usability, functionality and cost effectiveness.

**Table No. 4.1.15**

*Interest to pay extra money for extendable clothing* N=100

Price range (in Rs.)	Frequency	Percentage
Below 500	38	38%
500-1000	52	52%
Above 1000	10	10%

Table No. 4.1.15 shows the price ranges that mothers are interested to pay extra for extendable clothing. The data represents that 52% of the mothers are interested to pay Rs.500-1000 extra money for such clothing, 38% of the mothers are interested to pay below Rs.500 and 10% of the mothers are interested to pay extra money above Rs.1000 for extendable clothing.

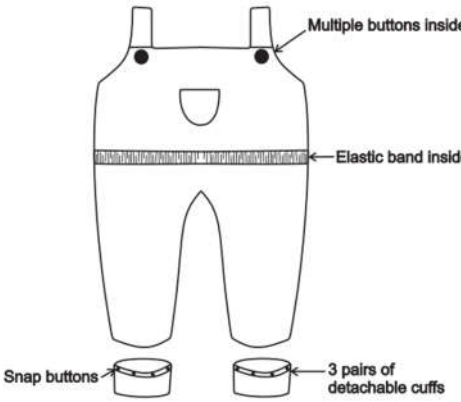
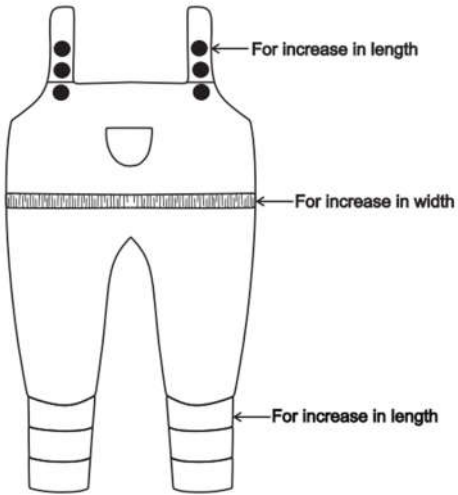
**II. Designing, construction and acceptability of the constructed extendable apparel for kids.**

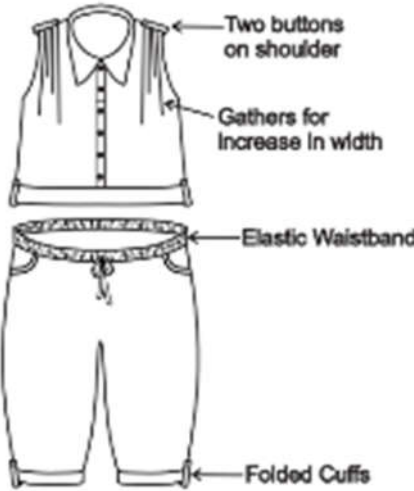
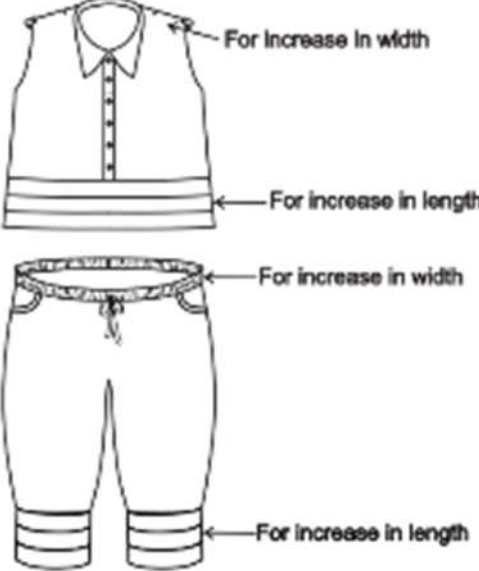
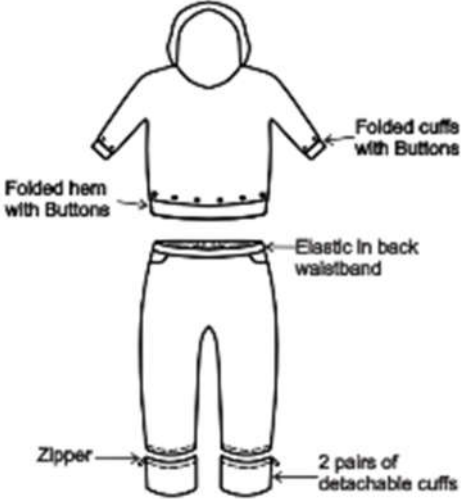
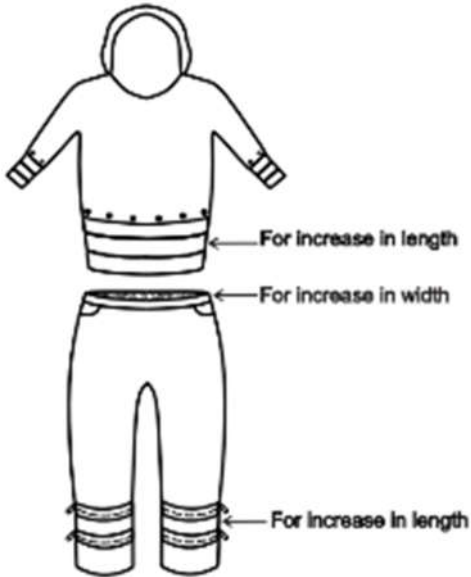
1. Designing

Unisex kids apparel were designed which includes the features of extending in length measurements as well as in width measurements. Garments were designed keeping in mind of the body changes in kids for the first six years. Size chart was followed from the book ‘Pattern Grading for Children’s Clothes- The Sizing Technology’ by Gerry Cooklin. The difference in measurements from 2 to 6 years was calculated and then the designing was done according to the measurements. The garments were designed in such a way that can be worn by both boy and girl child which serves the functionality purpose. The designing focused mainly on the extending size in length wise and width wise.


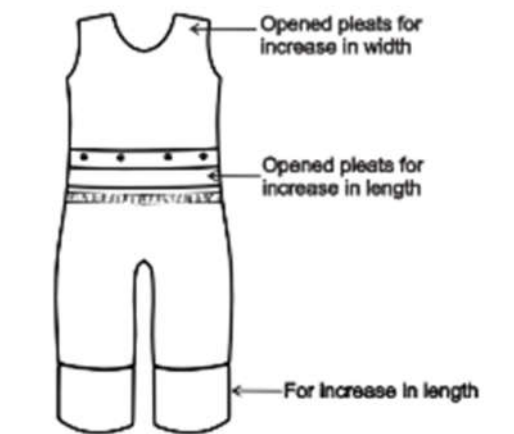

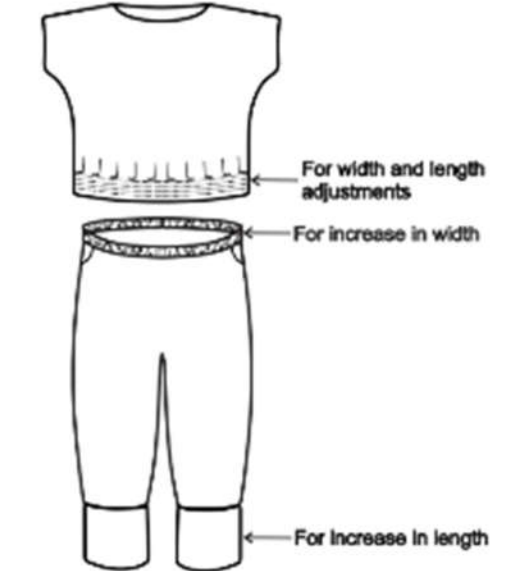
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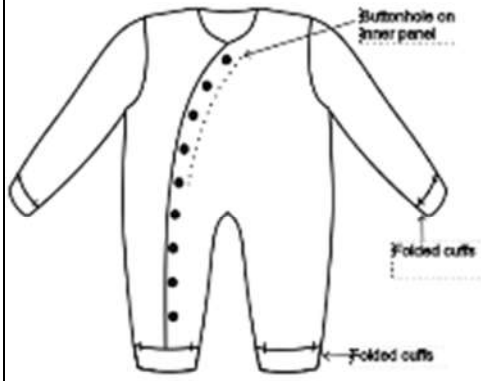
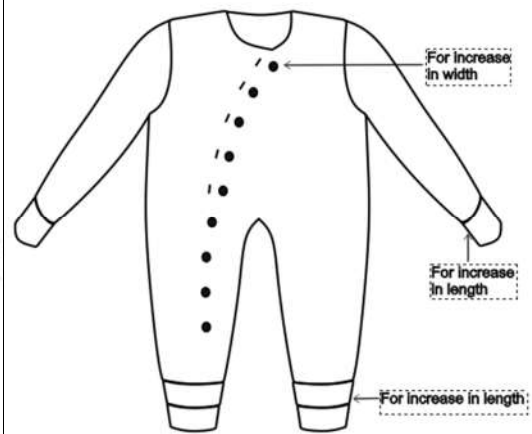
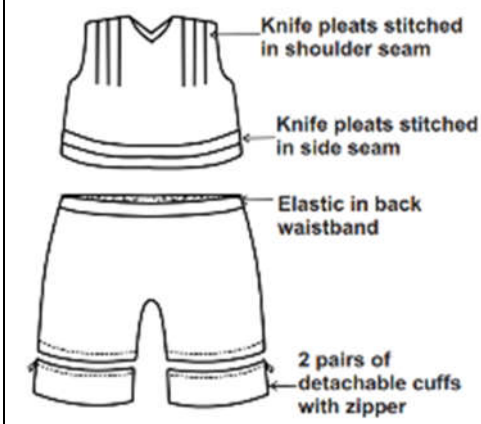
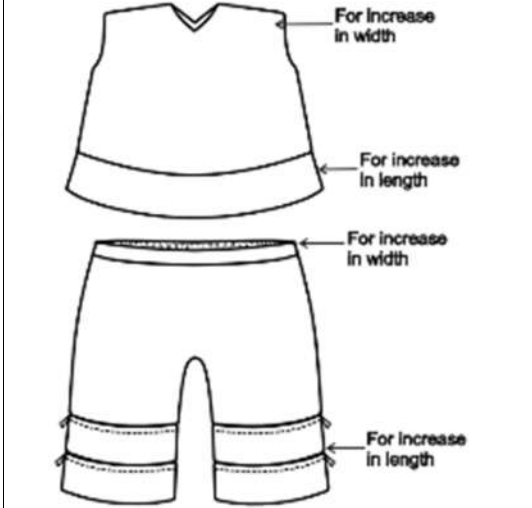
*Designs for unisex clothes*

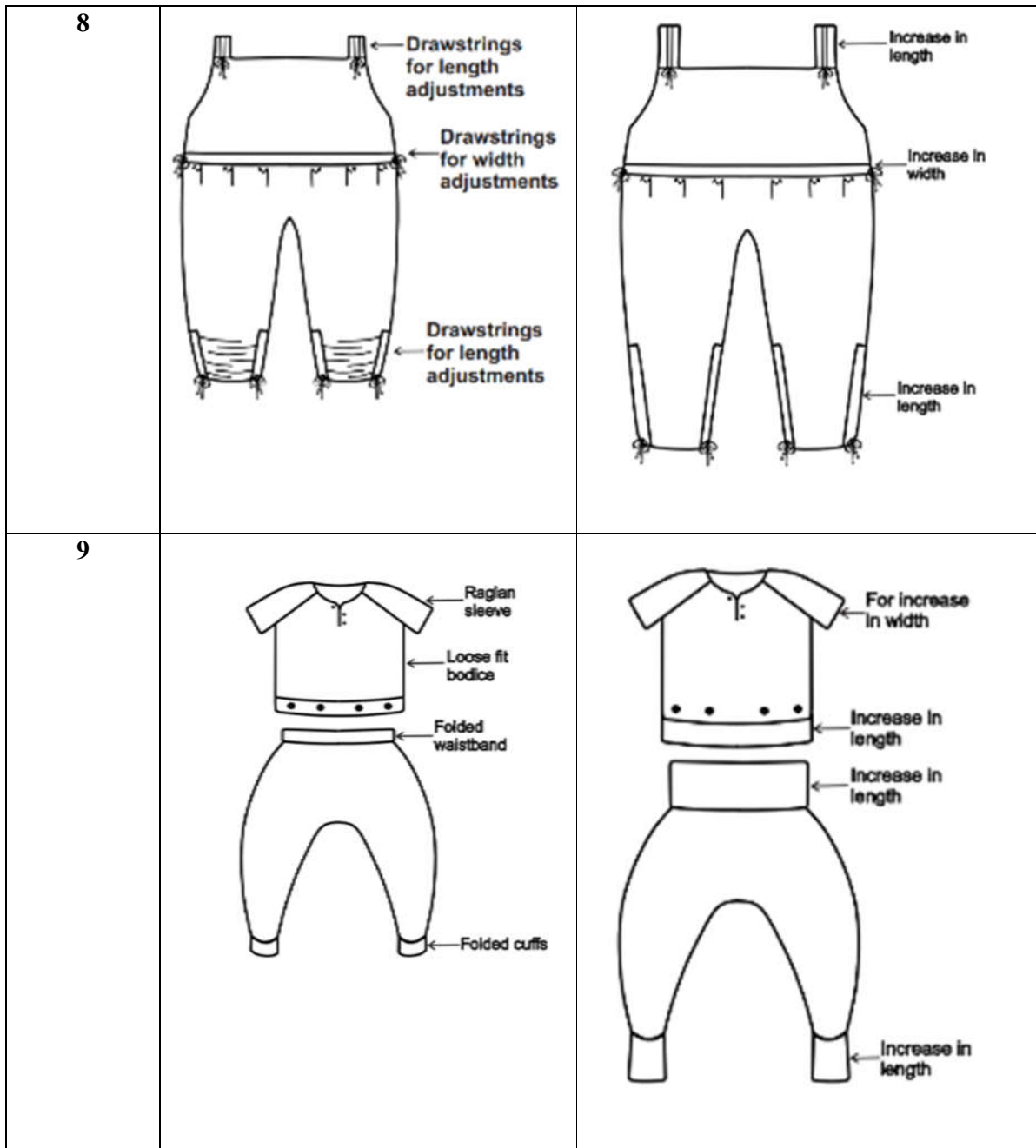
Design No.	Before adapting size	After adapting size
1		

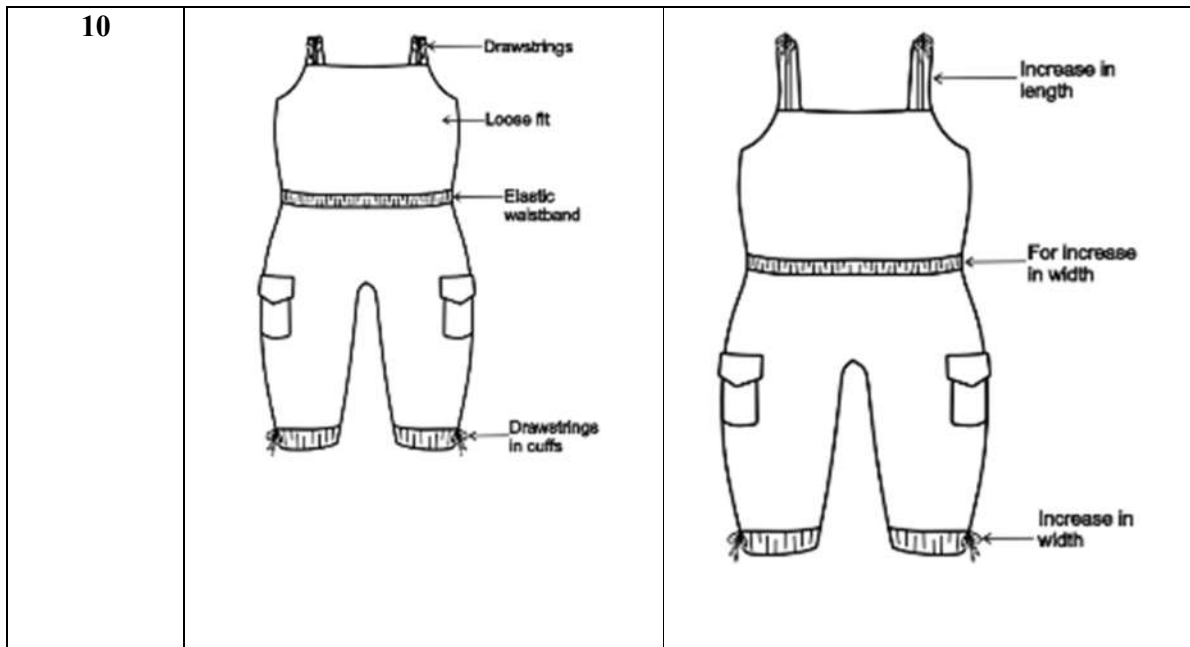
<p>2</p>	 <p>Two buttons on shoulder</p> <p>Gathers for increase in width</p> <p>Elastic Waistband</p> <p>Folded Cuffs</p>	 <p>For increase in width</p> <p>For increase in length</p> <p>For increase in width</p> <p>For increase in length</p>
<p>3</p>	 <p>Folded cuffs with Buttons</p> <p>Folded hem with Buttons</p> <p>Elastic in back waistband</p> <p>Zipper</p> <p>2 pairs of detachable cuffs</p>	 <p>For increase in length</p> <p>For increase in width</p> <p>For increase in length</p>



<p>4</p>	 <p>Inverted pleat</p> <p>Elastic waistband</p> <p>Box pleat inside bucked with buttons</p> <p>Folded Cuffs</p>	 <p>Opened pleats for increase in width</p> <p>Opened pleats for increase in length</p> <p>For increase in length</p>
<p>5</p>	 <p>Kimono sleeve</p> <p>Shirring</p> <p>Elastic in waistband</p> <p>Folded Cuffs</p>	 <p>For width and length adjustments</p> <p>For increase in width</p> <p>For increase in length</p>

<p>6</p>		
<p>7</p>		





**Evaluation of 10 design sheets by 10 industry and academic experts using 5 point rating scale.**

The design sheets were shown to the experts for evaluation. 10 experts were approached, i.e. 5 industry experts and 5 academicians. They evaluated the designs using 5 point rating scale.

**Table No. 4.2.2**

*Evaluation of designs*  
N=10

Design No.	Design	Concept	Neatness	Functionality	Aesthetic Appeal	Total (Max . 250)	Mean	Rank
1	48	49	45	46	46	234	46.8	<b>I</b>
2	43	38	40	40	41	202	40.4	IV
3	38	39	39	36	37	189	37.8	VII
4	47	44	49	42	44	226	45.2	<b>III</b>

5	35	31	35	34	33	168	33.6	VIII
6	29	31	35	28	29	152	30.4	X
7	49	47	47	43	46	232	46.4	<b>II</b>
8	41	39	41	36	38	195	39.0	VI
9	32	31	32	28	31	154	30.8	IX
10	41	34	39	38	42	194	39.8	V

Table No. 4.2.2 represents the evaluation of 10 unisex design sheets by 10 experts (5 industry and 5 academicians). It was concluded that Design No. 1, 7 and 4 were the most preferred designs of extendable kids apparel and were constructed. Design No.1 dungaree was ranked first because of its detachable cuffs style. The experts liked the designing and felt that it serves the purpose correctly. The t-shirt and shorts set of Design No. 7 was ranked second as it has multiple pleats design which attracted them the most. The detachable cuffs using zippers was also liked by them. Design No.4 romper dress was third most liked design by the experts. It has hidden pleat in the bodice which impressed them and its extendable cuffs was also liked by the experts.

## 2. Construction

After the evaluation of designs by the experts, the most preferred 3 designs were selected for construction. The fabric was sourced from local market and the selection of fabric and colour was according to the results of survey. The preferences of mothers were followed and fabric was purchased accordingly. The construction was done according to the size chart and design sheets. After construction and finishing, the garments were then evaluated by the mothers.

## 3. Acceptability

To check the acceptability of the constructed garments, the garments were evaluated by 20 mothers, both working and non-working mothers. 5 point rating scale was used and ratings was given on certain criteria of Design, Comfort, Neatness, Fabric, Purpose and Aesthetic appeal of the garment.



**Figure 1.6.** Design No. 1  
Source: Field data

**Evaluation of 3 constructed garments by 20 mothers using 5 point rating scale.**

**Table No. 4.2.4**

*Evaluation* of *garments*  
N=20

Criteria	Design No.1	Design No.4	Design No.7
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**Figure 1.7.** Design No. 4  
Source: Field data

**Figure 1.8.** Design No. 7  
Source: Field data

Design/Style	94	92	92
Comfort	92	92	98

Colour Combination	98	96	98
Neatness	98	96	96
Fabric	94	98	96
Purpose	98	96	94
Aesthetic Appeal	98	94	94
Total	672	664	668
Mean	33.6	33.2	33.4
Rank	I	III	II

Table No. 4.2.4 depicts the acceptability of the constructed garments by mothers. The results shows that Design No.1 was most liked by the mothers followed by Design No.7 and Design No.4 respectively. Design No.1 was a unisex dungaree which was mostly preferred by mothers because it has multiple buttons at top for increasing length. It has elastic band at waist which adjusts according to the width changes. The pairs of detachable cuffs was most liked feature in the garment. Design No.7 was liked for its pleats design and detachable zipper cuffs. Design No.4 was a romper dress with pleat inside which was most preferred by mothers. The detachable upper with lower garment design also attracted the mothers.

### **SUMMARY AND CONCLUSION**

Children's clothing sector is a major part of the textile industry and is growing faster day by day. The kids are grown up fast and their clothing size is constantly changing. This generates the need of buying more and more new clothes and hence discarding the old ones. Clothing waste is a concern for the society. The purpose of this study is to find alternatives to reduce the waste and device small steps in which children contributes towards sustainability.

This design-based research aims to focus on designing and constructing unisex extendable apparel to fit different sizes and diverse body shapes. The objective of the study was to find the preferences of mothers towards clothes of their children. The study also aims to design,

construct and find the acceptability of extendable apparel for kids. Following the objectives of the research, a survey was done and 100 mothers having child of 0 to 6 years age were selected using convenience sampling method. A pre-tested questionnaire was filled and the data was analysed using frequency and percentage. The results showed that some mothers were not satisfied with the ready-made garments available in the market. The reason is that they do not find size, design and style of their choice. Mothers purchase kids clothes frequently because they run out of size so quickly. Majority of the mothers prefer unisex clothes which shows their thinking is changing with time. At the time of discarding outgrown clothes, majority of mothers give it to someone they know and only a few donate them. The results showed that mothers want to save more of outgrown kids clothes because they are related to their sentiments. Most of them have not seen extendable apparel in market and the results showed positive response for purchasing such clothing.

10 Unisex design sheets in this study were created for kids, age range from 2 to 6 years. The evaluation of designs was done by experts which consists of 5 academicians and 5 industry experts. Top three preferred designs by the experts were selected for the construction. According to the preferences of mothers regarding fabric, colour and prints which was concluded from the survey, the fabric was sourced. 3 garments were constructed following the measurement chart and were evaluated by 20 mothers.

The discarded clothes has serious impact on the environment. Thus, creating a need for smarter ways to reduce the waste. Everyone talks about different ways of how we as adults can save the planet for future generations but the coming new and future generations can also be a part in saving the planet. The smarter designing techniques can be a useful step towards sustainability in which children can contribute too.

The study concludes that maximum mothers buy kids clothing frequently because of the fast changing size and hence want to see extendable apparel in market. The mothers are ready to pay extra money for such size adaptive features in clothing. The subjects of this study were limited to unisex kids of 2-6 years but there is a need to expand a study to boys and girls of other ages. Further studies on this area is recommended. Some other innovative techniques in fabric development and apparel construction can be studied.

## REFERENCES

- Aflatoony, L. (2020). Size Adaptive Garments for Toddlers as an Approach to Maximize Fit and Durability, *International Textile and Apparel Association*



Retrieved from: <https://www.researchgate.net/publication/344014799>

- Archana (2020). Designing Kids Wear: Summary of Research & Recommendation for Kids Wear Designers, *Global Journal of Researches in Engineering*, 20(5), 2249-596.

Retrieved from: <https://engineeringresearch.org/index.php/GJRE/article/view/2072>

- Dogbey, R. et al. (2015). The effect of Fabrics and Designs on the Physical Comfort of Children Clothes in the Accra Metropolis, *International Institute for Science, Technology and Education*, 30, 2225-059X.

Retrieved from: <https://iiste.org/Journals/index.php/ADS/article/view/21265>

- Massey, S. and Jahan, S. (2011). Infant's clothing selection practices followed by mothers, 54, 43-45.

Retrieved from:

[https://www.researchgate.net/publication/290753466\\_Infant's\\_clothing\\_selection\\_practices\\_followed\\_by\\_mothers](https://www.researchgate.net/publication/290753466_Infant's_clothing_selection_practices_followed_by_mothers)

- Pandya, M. (2016). Consumer buying behaviour for children apparel: A critical review, *International Journal of Management*, 7(5), 188-199.

Retrieved from:

[https://iaeme.com/MasterAdmin/Journal\\_uploads/IJM/VOLUME\\_7\\_ISSUE\\_5/IJM\\_07\\_05\\_018.pdf](https://iaeme.com/MasterAdmin/Journal_uploads/IJM/VOLUME_7_ISSUE_5/IJM_07_05_018.pdf)

- Pargai, D., Gahlot, M. and Rani, A. (2015). Designing And Construction Of Functional Clothing For A Child With Diasability: A Step Towards The Social Responsibility, *The International Journal of Social Sciences and Humanities Invention*, 2(9), 1534-1541.

Retrieved from: <https://valleyinternational.net/index.php/our-jou/theijsshi>

- Rajvanshi, R. and Mittal, K. (2019). A study of the kids wears clothings problems among mothers of Udaipur district of Rajasthan, *Indian Journal of Research*, 8(9), 2250-1991. doi: 10.36106/paripex

- Rita, A. (2018). Specific requirement for development in children's clothing: customer's preference and satisfaction for buying, *International Journal of Business Marketing and Management*, 3(8), 20-29.

Retrieved from:

[https://www.researchgate.net/publication/327011802\\_Specific\\_requirement\\_for\\_development\\_in\\_children's\\_clothing\\_customer's\\_preference\\_and\\_satisfaction\\_for\\_buying](https://www.researchgate.net/publication/327011802_Specific_requirement_for_development_in_children's_clothing_customer's_preference_and_satisfaction_for_buying)

- Tripathi, V. et al. (2019). An Empirical Study in the Indian kids apparel market, *A Journal of Composition Theory*, 12(9), 0731-6755.

Retrieved from: <http://www.jctjournal.com> › gallery › 222-sep2019

- <https://www.indiantextilejournal.com>
- <https://www.lifestyle.livemint.com>
- <https://www.fastcompany.com>
- <https://www.researchgate.com>
- <https://www.ecotextile.com>
- <https://www.thehindu.com>
- <https://www.shoppingbazar.in/showroom/firstcrycom-store-surat-vesu>
- <https://pmrpresselease.com/kids-wear-market-size-share-and-growth-industry-analysis-report-2025/>
- [www.dezeen.com](http://www.dezeen.com)
- [www.fibre2fashion.com](http://www.fibre2fashion.com)
- [www.dogonews.com](http://www.dogonews.com)