ISSN 2582-7472

ShodhKosh Journal of Visual and Performing Arts

5(ICETDA24), May (2024)
International Conference on Emerging Trends in Design and Arts
(Special Edition) - 2024

A Knowledge Repository

Dear Readers and Contributors,

The Faculty of Design and Arts (FDA), Poornima University, Jaipur, in collaboration with the Indian Institute of Craft and Design, Jaipur; Adelaide Central School of Art, Australia; and Banasthali Vidyapith, Rajasthan, successfully organized the 2nd edition of the **International Conference on Emerging Trends in Design and Arts (ICETDA24)** on April 5th and 6th, 2024. The conference witnessed participation from over 32 institutions and colleges.

Eminent keynote speakers, including **Dr. Rima Hooja** (Director, Maharaja Sawai Man Singh Museum, City Palace, Jaipur & Director, Jaigarh Fort), **Mr. Pramod Sharma** (Eminent Author and Poet, Jaipur), **Dr. Daniel Connell** (Visual Artist, Adelaide Central School of Art, Australia), **Prof. Bhagav Mistry** (Design Practitioner and Pedagogist), **Dr. Shalu Rustagi** (Professor, IICD, Jaipur), **Dr. Rena Mehta** (Associate Professor, IICD, Jaipur), **Dr. Ashima Arora** (Associate Professor, IICD, Jaipur), **Dr. Mahesh Singh** (Professor, BHU, Varanasi), **Dr. Arjun Kumar Singh** (Associate Professor, Rabindranath Tagore University, Bhopal), **Dr. Kingshuk Mukherjee** (Associate Professor, IICD, Jaipur), **Dr. Isha Bhatt** (Assistant Professor, Banasthali Vidyapith, Rajasthan), and **Mr. Jay Patel** (Assistant Professor, Banasthali Vidyapith), graced the occasion and chaired various sessions.

The 2nd **ICETDA24** was a resounding success, offering an invaluable platform for the exchange of knowledge and ideas across interdisciplinary areas of design and arts. The conference received over 120 abstract submissions, with 90 papers and 34 posters scheduled for presentation, covering a wide range of topics including Visual Arts, Performing Arts, Animation, Gaming, AR and VR, Fashion Design, Textile Design, Interior Design, and Product Design. Out of 90 papers submitted, 62 were selected for publication in the UGC Care-Listed journal **"ShodhKosh: Journal of Visual and Performing Arts"** as part of a special issue titled **" International Conference on Emerging Trends in Design and Arts."**

I extend my deepest appreciation to **Granthaalayah Publications** for their exemplary partnership with our institution, which has provided researchers with proper recognition. With significant research contributions that will advance the fields of art and design, the Faculty of Design and Arts is eager to further strengthen this collaboration in the future.

Sincerely,
Dr. Jitendra Sharma
Dean & Professor, Faculty of Design and Arts, Poornima University, India

Guest Editors

DOI: https://doi.org/10.29121/shodhkosh.v5.iICETDA24.2024 **Published:** 2024-05-31

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 42–49

ENHANCING AWARENESS AMONG UJJAIN BATIK PRINTS' ARTISANS ABOUT THE GEOGRAPHICAL INDICATION TAG

Divya Solanki [1], Varun Tiwari [1], Dr. Hemant Kaushik [1]

[1] School of Design, Avantika University, Ujjain, India

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1283

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

Geographical indication gives critical information regarding artisanal products. It plays a major role in presenting and promoting traditional crafts and products of the local region. Artisans in central parts of India give less importance to the GI tag which is hampering their sales or reducing the chances of getting the economic advantage. Therefore, this paper attempts to capture the effects of considering as well as not considering the GI tag for the promotion of their crafts. It studies the current scenario of not considering the GI tag by evaluating the effect of the sales and promotions of the Ujjain batik print. It also discusses the impact on craft if artisans give effective importance to the GI tag. The importance of the GI tag has been evaluated here by considering a case example of artisans practicing batik craft in the Ujjain region. The study evaluated that the lack of awareness among artisans regarding the GI tag makes it challenging to generate more revenue for dealers and artisans. It also hinders the growth of sales and promotions for their crafts. Bridging this awareness gap could significantly enhance their ability to market and sell their products successfully as well as improve the product's visibility both nationally and internationally. To achieve the research objectives, a descriptive research method approach is applied for data collection for well-structured interviews of 50 artisans of Bhairavgarh. The purpose of this study is to examine the impact of the lack of awareness among artisans regarding the GI tag, with a focus on the ability to increase their sales and promotion of the craft.

1. INTRODUCTION

The handicraft industry is India's second-largest unorganized industry after agriculture in terms of job creation in rural areas. India has a rich cultural history of crafts, and each craft is renowned because of the locals' skills, which have been developed over many generations and extended periods. The handicraft industry directly and indirectly employs around 7 million people, many of whom are women and members of the underprivileged segments of society. Every region of India has its distinctive textiles that reflect the skills of craftsmen, they meticulously craft the fabric and surface decoration that sets them apart from those of other or nearby regions. For an extensive period, people used these textiles with pride, signifying their origin and social standing (Ajay Tamta, 2017)

A geographical indicator (GI) is a label applied to goods that originated in a certain region and have characteristics or a reputation unique to that region. The TRIPS Agreement of the World Trade Organization, which went into effect in 1995, was the first international intellectual property law to utilize the term "geographical indication." The GIs of Goods (Registration and Protection) Act, which was passed into law in India in 1999, went into implementation in September 2003 (Londhe). GI grants the sole rights to a region's producers to use the indicator on goods that are locally made. By using the GI tag they are entitled to forbid any unauthorized use or copying of the sign on a product not made in the

approved region or does not meet the GI's quality standards. It is mostly used to distinguish things that are handcrafted from a specific region that has gained popularity with consumers because of its uniqueness. A community that is a part of that specific location typically possesses the geographical indicator. Under the Geographical Indication of Goods (Registration and Protection) Act 1999, a Geographical Indications Registry is in operation with all Indian jurisdictions (Manjunatha, 2016).

2. ABOUT THE GI OF UJJAIN BATIK PRINT

Ujjain Batik Print was registered as a GI by Arunodaya Sarveshwari Lok Kalyan Samit and Deen Dayal Mahila Rangai Chhapai, Silai, Kadhai Bahudesiya Antyodaya Sahkari Sanstha in 2022. Registered as Ujjain Batik Print under Application No. 700 in respect of Textile and Textile Goods falling in Class - 24 and 25. It is hereby advertised as accepted under Sub-section (1) of Section 13 of the Geographical Indications of Goods (Registration and Protection) Act, 1999. "Deen Dayal Mahila Rangai Chhapai Silai, Kadhai Bahudesiya Antyodaya Sahkari Sanstha" is registered with the Sub Registrar of Cooperative Societies Ujjain, Madhya Pradesh, making them an Applicant under Section 11. This organization is related to the marketing, production, and well-being of the region. The organization's members are drawn from the Batik Print community.

"Arunodaya Sarveshwari Lok Kalyan Samit" is registered with Ujjain under the Madhya Pradesh Society Registration Act, 1973, and qualifies under Section 11. This organization is also related to the marketing, production, and well-being of the geographical areas. The government of India, the government of Madhya Pradesh, and NABARD have all supported the organization for a very long time as it directly supports the batik print community and promotes this age-old traditional craft in many ways. Both organizations are working on marketing, manufacturing, and well-being in the relevant region. The organization's members are from the Batik Print community, are acknowledged by the government of Madhya Pradesh, and are connected to Batik Print producers and producing regions (Intellectual Property India).

Apart from the registered GI organizations, some other organizations such as cooperative societies and NGOs are also supporting the batik craft and artisans of Bhairavgarh. Ujjain's Swastik Mahila Udyog Sahakari Samiti Myt. is a cooperative society registered under the Society's Registration Act 1960 under section 7. The society promotes several crafts like Batik Print, Block Print, Kalamkari, and Tie & Die. The women of the Society create exquisite clothing that they sell at emporiums and government and non-government exhibitions (Swastik Mahila Udyog).

3. HISTORY OF UJJAIN BATIK

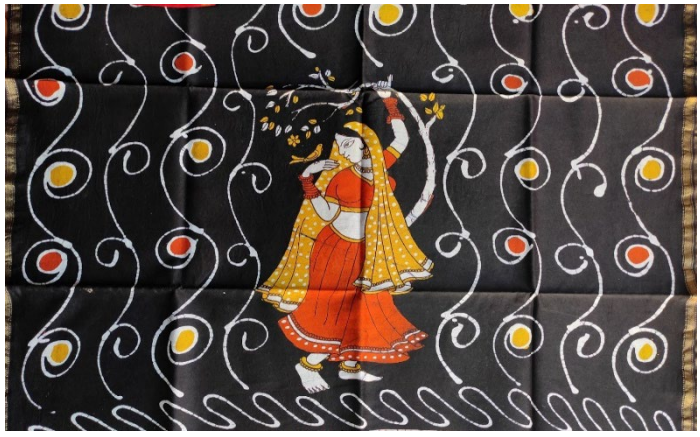


Fig. 1. Solanki. Batik Printed Fabric. 11 Nov. 2023.

For ages, artisans of colors have been one of the major centers of attraction in Bhairavgarh. This small village of Bhairavgarh is located on the banks of the Shipra River, only a short distance from Ujjain. The town is the center of Batik printing and is well-known for its magnificent Kaal Bhairav temple. Wax-resist dyeing and printing is a centuries-old art form that is believed to have been used for more than 2,000 years in countries including Egypt, Japan, and India. During the Mughal era, the ancient craft of batik made its way into Madhya Pradesh's handloom and craft industries. Around 400 years ago, craftspeople from Gujarat and Rajasthan settled in Bhairavgarh, which later became the center of Batik

printing in Madhya Pradesh. Batik printed cloth was originally used for draped clothing by the local tribal people. Today, over 800 artisans are working in the village of Bherugarh (MP Tourism, 2020)

From a historical angle, above 150 households rely on the traditional Bhairavghar print, which began with blocks made of potatoes and bandhej and has since come a long way through blocks of wood, alizarin chemicals, and screen-printing techniques. Today, a wide variety of dress materials, sarees, and home furnishings are sold throughout the country. The base fabric is sourced from Rajasthan, Maharashtra, and Tamil Nadu. (District Administration Ujjain). Craftsmen also utilize local Chanderi and Maheshwari fabric as the base for printing to merge two different handicrafts for a delightful mix. Hot melted wax is now utilized in place of the specially prepared soil that was used in the past, together with a pen or brush for dying. If there are multiple colors, the steps are carried out once again for each color. Natural candle wax has been replaced by industrial wax, reducing the amount of wax that may be recycled. Natural pigments are also less frequently utilized and are instead substituted with chemical dyes. These are the outcomes of the need for less expensive materials and quicker production. Artisans have been impacted by the mechanization of printing and dying. They have kept their tradition as it is in preserving their skills by being resourceful, efficient, and flexible in their work techniques to meet changing market demands. (Gatha, 2010)

Fig. 2. Solanki. Batik Printing Tools. 23 Oct. 2023.

These artisans practice this craft under the supervision of their ancestors, who taught it to them or passed it down to them. This explains why they possess an innate capacity to create original themes. Batik's method evolved, but its motifs stayed mostly constant. Typically, artisans create traditional motifs on their initiative, though occasionally they are prompted by customer demand. Motifs are inspired by natural elements like leaves, flowers, animals, and paisley. Several motifs, such as the human figure, animal figure, the Shiva statue, the rising sun, etc.

Fig. 3. Solanki. Batik Printing Process. 23 Oct. 2023. Author's collection.

The novelty of the study contributes to the GI tag of Ujjain batik prints, its awareness levels among artisans, and the subsequent effects on sales and promotions for the Ujjain batik print. The research includes the understanding of the GI tag of Ujjain batik print, an exploration of its awareness levels among the artisans of Bhairavgarh, and an assessment of the impact on the sales and promotion of the craft, by understanding the current information gap about the intricate

relationship between the GI tag and the Ujjain batik print by contributing valuable insights to its sales. By understanding the awareness levels of artisans regarding the GI tag and its influence on sales and promotions, this study highlights the crucial factors driving the recognition of the Ujjain batik craft. This knowledge is essential for informing promoting economic growth and preserving cultural heritage in the region.

4. OBJECTIVE

The objective of the study is to gain valuable insights into the awareness, perceptions, and impact of the GI tag on Ujjain batik print artisans. The key objectives of the study are as follows:

- To examine the awareness level among the artisans about the benefits of having a GI tag.
- To analyse the impact of GI on a critical factor of Ujjain batik print sales.
- To provide recommendations regarding the significance of GI tags and the potential benefits they can derive.

5. LITERATURE REVIEW

Manjunatha studied the Geographical indicators, a new type of intellectual property, that is evolving in India. Every year, the total number of geographical indicators that have been registered rises steadily. Among the states that are emerging as possible participants in this field is Odisha. This Tag benefits producers and consumers from prevents fraud (Manjunatha).

Harish Bapat explored the historical evolution of Geographical Indications (GIs) globally, back to the 19th century, with India's GI Act still in its early stages. However, despite its nascent status, the concept of GIs in India is not entirely novel in business and trade. He highlights several key outcomes of GI implementation, including regional empowerment, decentralization of business and trade, and opportunities for sustainable development. Despite controversies, the GI Act has paved the way for sensitization, creating trade opportunities and recognition. Furthermore, GIs serve as agents for ecological efficiency by preventing urban concentration and offering opportunities and recognition at the regional level, thereby contributing to regional development and curtailing migration to some extent. (Bapat).

Gauri Kathju explored valuable insights into the relationship between crafts and Geographical Indications (GIs). Government agencies play a pivotal role in incentivizing and promoting GIs, with a notable emphasis on textile crafts. Understanding the value chain model of these crafts sheds light on their socio-economic benefits, highlighting their significance beyond cultural preservation. Consumer awareness and buying behavior towards GI-based products emerge as crucial factors influencing market dynamics, suggesting a need for targeted strategies to enhance awareness and revenue generation for these products. (Kathju)

Shruti Tiwari studied the growth and evolution of Bhairavghar batik art from its traditional roots. The significance of preserving the craft's heritage and recognizing its aesthetic value as a handmade art form. Appreciating the craftsmanship involved in Bhairavghar batik craft can lead to a greater acknowledgment of artisans' skills and talents. Moreover, embracing innovative business practices can uplift the lifestyle of artisans, ensuring sustainable growth and prosperity within the community (Tiwari)

Swati Vyas and Isha Bhatt studied the current status of the Bhairavgarh cluster as the artisans are currently focused on batik craft, efforts are underway to revive traditional designs and reestablish the cluster's unique identity. Ujjain, with a rich history of textile printing since the 5th century AD, once boasted unique block printing techniques using natural dyes. However, the decline in traditional methods in Bhairongarh has led to the prevalence of synthetic dyes and pigment printing. The significance of promoting and preserving the authenticity of Bhairongarh designs reflects a positive sentiment towards traditional crafts. This underscores the importance of supporting artisans and safeguarding cultural heritage. The insights offer valuable guidance for efforts aimed at revitalizing the traditional prints of the Bhairongarh cluster, including considerations for design, pricing, packaging, and retail locations to align with consumer preferences and market demands. (Vyas and Bhatt)

6. METHODOLOGY

The study is based on the GI of the Ujjain batik print and the craft specific to the region, the study was conducted in the Bhairavgarh batik cluster. The work involves both the primary and the secondary data to find out the awareness of GI

among artisans. The primary data was collected from Bhairavgarh-based artisans via questionnaire as well as on-site observation. Secondary data was collected from different research papers, articles, and websites. The data was analyzed to extract useful information related to sales, promotions & awareness. The primary data will provide insights gathered directly from artisans including conducting surveys, interviews, or observations to gather insights into artisan's awareness levels regarding the Geographical Indication (GI) tag, their sales promotion strategies, and their perspectives on the impact of the GI tag on sales and promotions. The secondary data will give information from existing sources such as articles, research papers, government reports, and blogs. This data provided background information on the Ujjain batik print cluster, the significance of the GI tag, and other previous studies conducted on similar topics. Below is the conceptual framework flowchart that depicts the sequential process of data collection, analysis, and interpretation of the study.

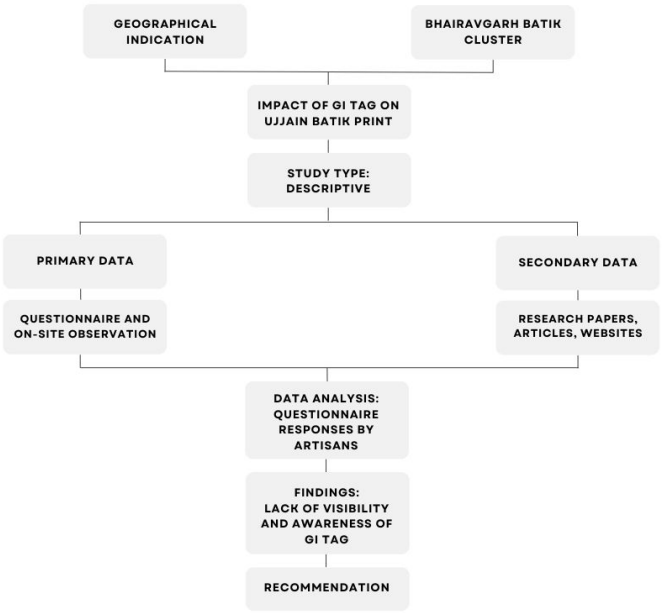
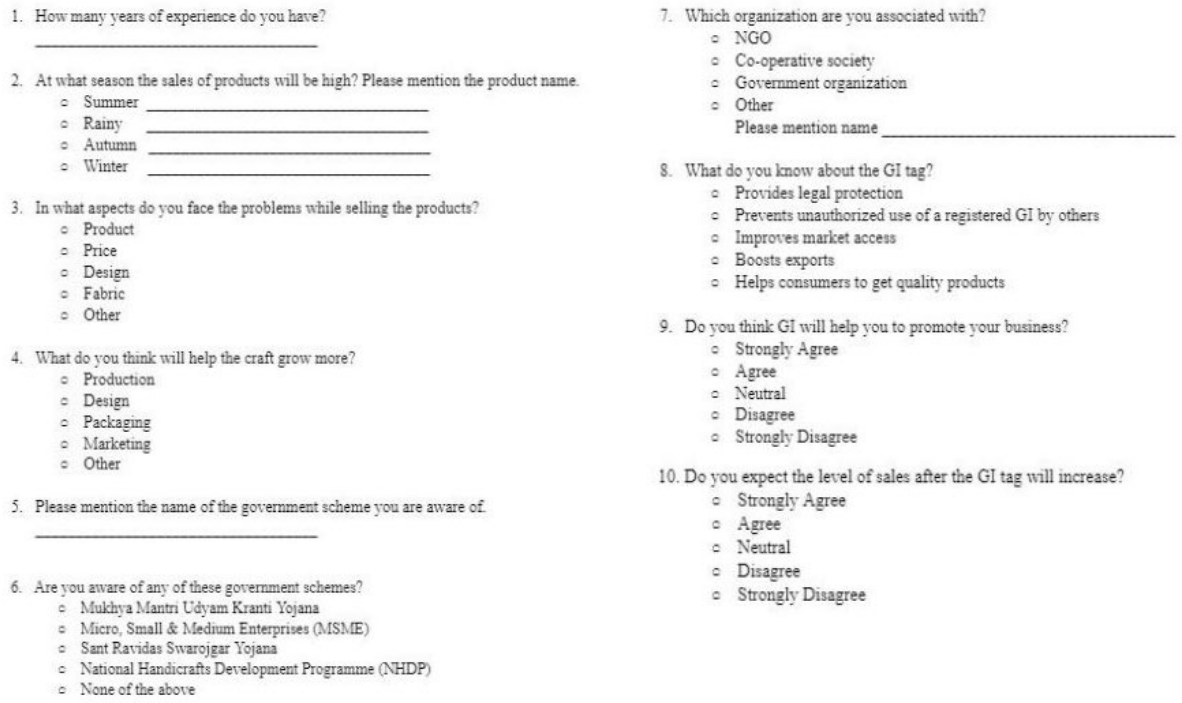


Fig. 2. Conceptual Framework

7. RESULT AND INTERPRETATION



1. How many years of experience do you have?
   _____
2. At what season the sales of products will be high? Please mention the product name.
   - Summer _____
   - Rainy _____
   - Autumn _____
   - Winter _____
3. In what aspects do you face the problems while selling the products?
   - Product
   - Price
   - Design
   - Fabric
   - Other
4. What do you think will help the craft grow more?
   - Production
   - Design
   - Packaging
   - Marketing
   - Other
5. Please mention the name of the government scheme you are aware of.
   _____
6. Are you aware of any of these government schemes?
   - Mukhya Mantri Udyam Kranti Yojana
   - Micro, Small & Medium Enterprises (MSME)
   - Sant Ravidas Swarojgar Yojana
   - National Handicrafts Development Programme (NHDP)
   - None of the above
7. Which organization are you associated with?
   - NGO
   - Co-operative society
   - Government organization
   - Other
     Please mention name _____
8. What do you know about the GI tag?
   - Provides legal protection
   - Prevents unauthorized use of a registered GI by others
   - Improves market access
   - Boosts exports
   - Helps consumers to get quality products
9. Do you think GI will help you to promote your business?
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
10. Do you expect the level of sales after the GI tag will increase?
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree

Fig. 4. Survey Questionnaire for Artisans and Dealers.

1. 25% of artisans have been working in this craft for less than 10 years, some of them started working in this craft as per their interest and some joined this craft and taken over the business from their ancestors as this craft is a family business and a source of income. 40% of artisans have been involved in this craft for 10 to 20 years. 30% of artisans are master artisans, continuing the craft for more than 20 years and the remaining 5% of the artisans have now taken retirement and teaching the craft to their new generation.
2. In summer, sarees, and suit sales are higher. In the rainy season, sales started decreasing, while in the winter season, more home furnishings like bedsheets, cushion covers, etc are sold, especially due to the festive season which starts from October - November.
3. Fabric received the highest number of votes with problems faced by artisans as many customers demanded different fabrics. The secondary concern is the pricing of the products, due to customers bargaining, artisans didn't receive the deserving compensation for their work. Sometimes design-related problems are also faced by the artisans as customers ask for new designs.
4. The production received 65% the highest number of votes for growing the business as artisans face financial problems for more inventory for the upcoming season and sometimes, they receive payment from the wholesalers or government organizations after 2-3 months of selling the products, due to which they face financial problems for further production. Design received 20% and marketing received 35% votes as these aspects are also important for growing the business. None of the artisans responded on the packaging that they preferred no extra cost on it. They indicated that using plastic bags is sufficient for their packaging needs.
5. 90% of the artisans are not aware of any of the government schemes, due to a lack of effective communication from the government organizations. Only 5% are aware of the MSME scheme and 5% are aware of DCS.
6. 50% of artisans were aware of the MSME cluster development scheme, 45% heard about the Mukhya Mantri Udhyam Kranti Yojana, and 5% heard about the Sant Ravidas Swarojgar Yojana. 30% of artisans do not know about any of the schemes they are asked for.
7. All the artisans have registered with the Madhya Pradesh Hastha Shilpa Vikas Nigam (HSVN) government organization.
8. 40% of artisans don't know about the GI tag due to a lack of awareness. While 60% of artisans know about the GI, only 20% of artisans understand the benefits associated with the GI tag.

9. 45% of artisans neither agree nor disagree about the promotion of their business after getting the GI tag. 30% of artisans disagree about the promotion, as they believe that the existing commercial activity meets their needs. While 25% of artisans agree because products with GI tags will be identifiable on the global market.
10. After explaining about GI, 50% of the artisans neither agree nor disagree that the GI tag will help them to increase their level of sales. Only 25% of the artisans agree and 15% of artisans strongly agree that the GI tag will help them to increase their sales in both national and international markets. 10% of the artisans disagree as they hold a differing perspective, asserting that the current business and sales they generate are satisfactory.

8. FINDINGS

The study reveals that the artisans are uncertain about the potential of the Geographical Indication (GI) tag for their work. Instead, many artisans express satisfaction with their existing sales, casting doubt on the perceived benefits of the GI tag for their craft. Several findings are:

1. Ujjain batik print artisans have a limited understanding of the concept, purpose, and benefits of obtaining a GI tag for their craft.
2. Among Ujjain batik print artisans, there is a lack of efficient communication routes for spreading knowledge about the GI tag. There aren't many workshops, training sessions, or educational resources on the significance of GI tags.
3. Artisans are not aware of the marketing benefits related to the GI tag, which leads to limited utilization of the GI tag for promotion.
4. Artisans prioritize their traditional methods ahead of any other legal aspects. Instead of understanding the advantages of the GI tag, their focus remains on their current sales and craft skills.
5. Many artisans are not aware of the sales potential that a GI tag brings and how it improves their product's marketability and creates more demand and financial potential.
6. The lack of community engagement and collaboration to educate artisans on the importance of the GI tag results in a lack of awareness within the Ujjain batik print artisan community.
7. Some artisans express satisfaction with their existing sales including local markets, exhibitions, and direct sales to customers. They believe that the current approach meets their financial needs without the perceived complexities of the GI tag.
8. It's important to understand that Ujjain batik print craftspeople may have different opinions about the GI tag. Some people are wary, but others are willing to learn more about the benefits and protections that GI tags can offer.

9. SUGGESTIONS

1. Information about Geographical Indications (GI) should be shared, and awareness raised by government & private organizations, and educational institutions, etc.
2. Organize training sessions and workshops to educate artisans about the importance of the GI tag, its advantages, and how it safeguards their distinctive work.
3. Conduct collaborative events of Bhairavgarh batik artisans, which include exhibitions, fairs, or cultural events where artisans can showcase their work under the GI-protected tag.
4. Conduct campaigns to educate consumers about the importance of GI-tagged products and promote the cultural and economic benefits of purchasing authentic craft.
5. Collaboration with government agencies, NGOs, and trade organizations to promote Ujjain batik print at national, and international levels.
6. Incorporate experiences with Ujjain batik prints into regional tourism campaigns. Provide guided tours of the batik cluster allowing visitors to witness the craft process and purchase authentic products.

10. DISCUSSION

The study presented the promotion and acceptance of the Geographical Indication (GI) tag for Ujjain batik print artisans. Certain artisans are satisfied with existing practices, while some are willing to learn more about the benefits of GI tag. The research suggests that educational campaigns, collaborations, and consumer engagement initiatives are crucial to building awareness about the GI and fostering a positive perception of the GI tag. The findings highlight the need to address the concerns and misconceptions of artisans about the GI tag. It is necessary to inform and involve them about the possible advantages of the GI tag for their craft and overall livelihoods. Developing a collaborative and well-informed

strategy will be crucial to managing the fine line between preserving traditional practices and leveraging the advantages offered by the GI tag for Ujjain batik print.

Limitations of the study primarily rely on data from artisans, which may be subject to inaccuracies. The research focuses on the sales & promotion and acceptance of the GI tag among artisans but may not fully capture the perspectives of other stakeholders such as consumers, and industry experts. External factors such as economic conditions, or market trends could influence the effectiveness of promoting the GI tag.

11. FUTURE SCOPE

1. Conduct longitudinal studies to track changes in artisan attitudes and perceptions towards the GI tag over time, allowing for a more comprehensive understanding of its long-term impact.
2. Explore the role of different organizations, such as cooperatives or NGOs, in facilitating awareness and acceptance of the GI tag among artisans and assess their effectiveness in driving adoption.
3. Investigate the economic implications of GI certification for artisans, including its impact on market access, pricing, and income levels, to provide a more holistic assessment of its benefits.
4. Expand the scope of research to include analyses of GI promotion strategies across different craft communities, regions, or countries, to identify best practices and lessons learned that can inform future initiatives.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

None

REFERENCES

Vyas, S., & Bhatt, I. (2023). ACCESSING MARKET PROBABILITY OF BHAIRONGARH PRINTS. International Journal of Social Science and Economic Research, 08(07), 1800–1812. https://doi.org/10.46609/ijsser.2023.v08i07.009

(2020, April 23). Geographical indication and its impact on the livelihoods of the crafts sector. https://shodhgangotri.inflibnet.ac.in/handle/20.500.14146/8295

Singh, R., & Bharti, N. (2023). Geographical Indication and Rural Sustainable Development: A Bibliometric analysis. The Australasian Accounting Business and Finance Journal, 17(1), 32–50. https://doi.org/10.14453/aabfj.v17i1.03.

Sharma, S. (2019, April). GEOGRAPHICAL INDICATION IN INDIA: CURRENT SCENARIO AND THEIR PRODUCT DISTRIBUTION. nt. j. of Social Science and Economic Research, 4(4), 2792-2806. Retrieved from http://ijsser.org/more2019.php?id=204.

Tamta, A. (2017d, November 9). Indian textile & Handicrafts industry is the largest employment generator after agri: Ajay Tamta. www.business-standard.com. https://www.business-standard.com/article/news-cm/indian-textile-handicrafts-industry-is-the-largest-employment-generator-after-agri-ajay-tamta-117110900180_1.html

Manjunatha, N. K. (2016). Status of geographical indications in India, especially Karnataka.

Londhe, C. (2016). Title: A Study of Profile of Textile Industry for Geographical Indications in India Full paper title: A study of Profile of Textile Industry for Geographical Indications in India. Mitpune. https://www.academia.edu/29259875/Title_A_Study_of_Profile_of_Textile_Industry_for_Geographical_Indications_in_India_Full_Paper_Title_A_Study_of_Profile_of_Textile_Industry_for_Geographical_Indications_in_India

Gaatha. (2021b, July 28). Crackled colours. Gaatha - a Tale of Crafts. https://gaatha.com/batic-bhairavgarh-ujjain.

Handicraft | District Ujjain, Government of Madhya Pradesh | India. (n.d.-b). https://ujjain.nic.in/en/handicrafts.

Swastik Mahila Udyog: Sahakari Samiti M.Y.D.T. Ujjain (MP). (n.d.-b). https://swastikmahilaudyog.org./

Culture: Art & Crafts. (2020, March 30). Batik print - 2000 years of great art and still counting.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 36–41

THREADED LEAGACIES: AN ETHONOGRAPHIC STUDY ON TIBETAN BROCADES OF VARANASI HANDLOOM INDUSTRY

Ayush Tiwari[1], Dr. Kavita Chaudhary [2]

[1] Research Scholar, Banasthali Vidyapith & Assistant Professor, Pearl Academy, School of Creative Practice, New Delhi, India
[2] Associate Professor, Banasthali Vidyapith, Department of Design, Rajasthan, India

ABSTRACT

This ethnographic study delves into the intricate artistry and cultural significance of Tibetan brocades produced in the Varanasi handloom industry of India. Through participant observation, interviews, and archival research, this paper explores the interwoven threads of tradition, innovation, and globalization shaping the production and consumption of these textiles. It examines how Tibetan migrants and local artisans negotiate identity, tradition, and economic survival in the dynamic landscape of Varanasi's handloom industry. By unraveling the threaded legacies embedded in Tibetan brocades, this study sheds light on the complexities of heritage preservation, cultural adaptation, and economic sustainability in the context of India's rich textile heritage.

Keywords: Tibetan Brocades, Varanasi Handloom Industry, Ethnographic Study, Tradition, Globalization, Cultural Heritage, Identity, Economic Sustainability

Corresponding Author

Mr. Ayush Tiwari,
ayush.tiwari@pearlacademy.com

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1260

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

1. INTRODUCTION

Tibetan brocades, intricately woven with cultural symbolism and artistic finesse, hold a significant place within the vibrant tapestry of India's textile heritage. Nestled within the bustling lanes of Varanasi, the ancient city known for its handloom industry, Tibetan brocades find a unique home, blending the rich traditions of Tibet with the craftsmanship of local artisans. This introduction sets the stage for an exploration into the interplay of tradition, innovation, and globalization in the production and consumption of Tibetan brocades within the Varanasi handloom industry.

1.1 BACKGROUND

Varanasi's handloom industry boasts a centuries-old legacy, renowned for its exquisite textiles that have adorned palaces, temples, and homes across India and beyond. The city's handloom tradition intersects with the influx of Tibetan

migrants, who bring with them the artistry and heritage of Tibetan brocades. Tibetan brocades, characterized by intricate patterns and vibrant colors, hold deep cultural significance in Tibetan Buddhist rituals, ceremonies, and everyday life. The convergence of Tibetan aesthetics with Varanasi's handloom expertise creates a dynamic fusion, enriching both the cultural and economic landscape of the region.

2. RESEARCH OBJECTIVES

The primary objective of this study is to explore the production and consumption dynamics of Tibetan brocades in the Varanasi handloom industry. Specifically, the study aims to:

- Investigate the techniques and traditions involved in the production of Tibetan brocades within Varanasi's handloom clusters.
- Examine the socio-economic factors influencing the production and consumption of Tibetan brocades, including the role of Tibetan migrants and local artisans.
- Explore how globalization and changing market trends impact the production, distribution, and consumption patterns of Tibetan brocades.
- Analyze the ways in which Tibetan migrants and local artisans negotiate identity, tradition, and economic survival within the context of Varanasi's handloom industry.

2.1 STRUCTURE OF THE PAPER

The paper will proceed as follows:

- ***Introduction:*** Provides an overview of the topic, background information, research objectives, and structure of the paper.
- ***Literature Review:*** Explores existing scholarship on Tibetan brocades, Varanasi's handloom industry, and related themes such as globalization and cultural adaptation.
- ***Methodology:*** Describes the research approach, including participant observation, interviews, and archival research methods.
- ***Findings and Analysis:*** Presents findings from the ethnographic study and analyzes key themes and patterns emerging from the data.
- ***Discussion:*** Engages in a critical discussion of the findings, exploring their implications for heritage preservation, cultural adaptation, and economic sustainability.
- ***Conclusion:*** Summarizes key insights and contributions of the study, offering recommendations for future research and practice in the field of textile heritage conservation and promotion.

Through this structure, the paper aims to provide a comprehensive exploration of Tibetan brocades in the Varanasi handloom industry, shedding light on the intricate threads of tradition, innovation, and globalization woven into the fabric of India's textile heritage.

3. LITERATURE REVIEW

The literature on Tibetan brocades, Varanasi's handloom industry, and related themes such as globalization and cultural adaptation offers valuable insights into the rich tapestry of India's textile heritage and the dynamic interplay of tradition and modernity in the production and consumption of textiles.

Tibetan Brocades:

Scholarship on Tibetan brocades delves into the intricate artistry, cultural symbolism, and religious significance of these textiles. Researchers highlight the centuries-old tradition of Tibetan weaving, characterized by intricate patterns, vibrant colors, and motifs drawn from Buddhist iconography and Tibetan culture. Tibetan brocades are revered for their role in religious rituals, temple decorations, and ceremonial attire, reflecting the deep spiritual and aesthetic values embedded in Tibetan society.

Varanasi's Handloom Industry:

The literature on Varanasi's handloom industry traces its historical roots and evolution as a center of textile production in India. Researchers document the traditional techniques, craftsmanship, and artisanal skills that have been passed down through generations in Varanasi, shaping the city's identity as a hub of artistic excellence. Varanasi's handloom industry is celebrated for its diverse range of textiles, including silk sarees, brocades, and embroidered fabrics, which are sought after for their quality and craftsmanship.

Globalization and Cultural Adaptation:

Studies on globalization and cultural adaptation examine the impact of global economic forces, technological advancements, and changing consumer preferences on traditional craft industries like handloom weaving. Scholars analyze how artisans in Varanasi and other traditional craft clusters negotiate the challenges and opportunities presented by globalization, including increased competition, market integration, and the commodification of cultural heritage. Researchers also explore the strategies employed by artisans to adapt to changing market dynamics, such as diversifying product offerings, incorporating new designs and techniques, and leveraging digital platforms for marketing and sales.

Cross-Cultural Exchange:

The literature on cross-cultural exchange sheds light on the intersections between Tibetan and Indian textile traditions in the context of Varanasi's handloom industry. Researchers investigate the cultural exchanges, influences, and collaborations between Tibetan migrants and local artisans, highlighting the ways in which Tibetan motifs, designs, and weaving techniques have enriched Varanasi's textile repertoire. These studies emphasize the role of cross-cultural interactions in fostering creativity, innovation, and cultural diversity in the production of textiles.

Overall, the literature review provides a comprehensive understanding of Tibetan brocades, Varanasi's handloom industry, and the broader socio-cultural and economic dynamics shaping textile production and consumption in India. By synthesizing insights from diverse scholarly perspectives, this review sets the stage for a nuanced exploration of Tibetan brocades in the context of Varanasi's handloom industry, illuminating the interconnected threads of tradition, innovation, and globalization woven into the fabric of India's textile heritage.

4. RESEARCH HYPOTHESIS

The production and consumption of Tibetan brocades in Varanasi's handloom industry are influenced by a combination of traditional craftsmanship, innovative adaptations, and global market dynamics. This hypothesis posits that while traditional craftsmanship forms the foundation of Tibetan brocade production, artisans in Varanasi integrate innovative techniques and designs to meet the demands of a globalized market.

4.1 RESEARCH QUESTIONS

How do Tibetan migrants and local artisans negotiate their identities within the context of producing Tibetan brocades in Varanasi?

This question delves into the intersection of cultural identity and craft production. It seeks to understand how Tibetan migrants and local artisans perceive their roles within the Varanasi handloom industry, how they navigate cultural differences, and how their identities are shaped by their involvement in the production of Tibetan brocades. By exploring these dynamics, the research aims to uncover the complex interplay between cultural heritage and individual identity formation.

What role does tradition play in the production techniques and design motifs of Tibetan brocades?

This question focuses on the influence of tradition on the technical aspects and aesthetic elements of Tibetan brocade production. It examines the historical roots of Tibetan brocade craftsmanship, traditional weaving techniques, and design motifs passed down through generations. Additionally, it explores how these traditional elements are preserved, adapted, or reinterpreted by artisans in Varanasi to create contemporary Tibetan brocades that resonate with both cultural authenticity and market demands.

How have globalization and economic changes impacted the production and consumption of Tibetan brocades in Varanasi?

This question investigates the broader socio-economic forces shaping the Tibetan brocade industry in Varanasi. It examines the impact of globalization on market access, trade networks, and consumer preferences. Furthermore, it explores how economic changes, such as shifts in demand and production costs, influence the production practices and livelihoods of Tibetan migrants and local artisans. By analyzing these dynamics, the research aims to elucidate the challenges and opportunities presented by globalization in the context of Tibetan brocade production.

What challenges and opportunities exist for the economic sustainability of Tibetan brocade production in Varanasi's handloom industry?

This question focuses on the economic viability and long-term sustainability of Tibetan brocade production in Varanasi. It examines the challenges faced by artisans, such as competition from mechanized production, fluctuating market demand, and access to financial resources. Additionally, it explores potential opportunities for innovation, market

diversification, and sustainable practices that could enhance the economic resilience of Tibetan brocade producers. By addressing these challenges and opportunities, the research aims to provide insights into strategies for promoting the economic sustainability of Varanasi's handloom industry.

These research questions form the backbone of an in-depth exploration into the complexities of Tibetan brocade production in Varanasi's handloom industry. By addressing these questions, the research aims to deepen our understanding of the interplay between tradition, innovation, and globalization in the production and consumption of Tibetan brocades. Furthermore, it seeks to identify avenues for promoting the cultural preservation and economic sustainability of this unique craft tradition in Varanasi and beyond.

5. METHODOLOGY

This research employs a mixed-methods approach, combining participant observation, interviews, and archival research to gain a comprehensive understanding of Tibetan brocades in Varanasi's handloom industry. Each method offers unique insights into the production, consumption, and cultural significance of Tibetan brocades, allowing for a multifaceted analysis of this complex phenomenon.

Participant Observation:

Participant observation involves immersing oneself in the natural environment of the research setting, actively observing and documenting the behaviors, interactions, and processes of interest. In this study, the researcher will spend significant time within Varanasi's handloom workshops, closely observing the production process of Tibetan brocades. This will include documenting techniques such as warp and weft weaving, dyeing methods, and pattern creation. Additionally, the researcher will observe social interactions among Tibetan migrants, local artisans, and other stakeholders involved in the production chain. Through participant observation, the researcher aims to gain firsthand insights into the intricacies of Tibetan brocade production, including the role of tradition, innovation, and social dynamics shaping the industry.

Interviews:

Semi-structured interviews provide an opportunity to engage directly with individuals involved in Tibetan brocade production, trade, and consumption. The researcher will conduct interviews with a diverse range of participants, including Tibetan migrants, local artisans, traders, and other stakeholders. These interviews will be guided by a set of predetermined themes, such as identity, tradition, globalization, and economic sustainability, while also allowing for flexibility to explore emergent topics and perspectives. Through in-depth interviews, the researcher seeks to elicit rich narratives and personal experiences, providing deeper insights into the cultural, social, and economic dimensions of Tibetan brocades in Varanasi.

Archival Research:

Archival research involves the systematic examination of historical documents, trade records, and other archival sources to trace the historical trajectory of Tibetan brocades in Varanasi. By accessing historical archives, the researcher aims to uncover valuable insights into the origins, development, and transformations of Tibetan brocade production over time. This may include studying historical patterns, trade routes, and cultural exchanges that have influenced the evolution of Tibetan brocades within the Varanasi handloom industry. Archival research will complement the insights gained through participant observation and interviews, providing a broader historical context for understanding contemporary practices and challenges.

Data Analysis:

Data collected through participant observation, interviews, and archival research will be subjected to rigorous analysis to identify key themes, patterns, and insights. Qualitative data from interviews and participant observation will be analyzed using thematic analysis techniques, allowing for the identification of recurring themes and the interpretation of underlying meanings. Archival data will be analyzed using historical analysis methods, including content analysis and comparative analysis, to trace patterns and changes over time. The integration of qualitative and historical data will enable a comprehensive understanding of Tibetan brocades in Varanasi, illuminating the complex interplay between tradition, innovation, and globalization within the handloom industry.

Ethical Considerations:

Throughout the research process, ethical considerations will be paramount. Informed consent will be obtained from all participants involved in interviews and participant observation, ensuring voluntary participation and confidentiality. The research will also adhere to ethical guidelines regarding the respectful representation of participants' perspectives and the protection of sensitive information. Additionally, efforts will be made to ensure cultural sensitivity and

reciprocity in interactions with participants, acknowledging the importance of ethical conduct in research involving cultural heritage and community engagement.

6. SURVEY REPORT 1:

In order to supplement the qualitative data collected through participant observation, interviews, and archival research, a survey was conducted with 100 participants involved in the production and consumption of Tibetan brocades in Varanasi. The survey aimed to gather quantitative data on demographics, purchasing preferences, and perceptions of Tibetan brocades.

Demographics:

Age Distribution:

- The majority of respondents fell within the age range of 25-45 years, comprising 60% of the survey sample.
- A smaller proportion of respondents (25%) were aged 45-65 years, indicating a relatively younger demographic profile.
- Participants below the age of 25 constituted 15% of the survey sample.

Gender Distribution:

- The survey sample comprised a slight majority of female respondents, accounting for 60% of the participants.
- Male respondents constituted 40% of the survey sample.

Occupation:

- Respondents represented a diverse range of occupations within the Tibetan brocade industry in Varanasi.
- Artisans engaged in brocade weaving comprised 30% of the survey sample, highlighting their significant presence in the production process.
- Traders and retailers involved in the trade of Tibetan brocades constituted 25% of the respondents, reflecting the importance of the commercial aspect of the industry.
- Tourists interested in purchasing Tibetan brocades accounted for 20% of the survey sample, indicating the appeal of these textiles among visitors to Varanasi.
- Researchers and scholars studying Tibetan brocades and related cultural heritage comprised the remaining 25% of respondents, underscoring the academic interest in this field.

Purchasing Preferences:

Quality:

- Quality emerged as the most important factor influencing purchase decisions among respondents, with a significant majority (80%) indicating its paramount importance.
- This underscores the emphasis placed on craftsmanship and material quality in the production and consumption of Tibetan brocades.

Price:

- While price was considered important by respondents, 70% indicated a willingness to pay a premium for high-quality Tibetan brocades.
- This suggests that quality is prioritized over price by a majority of consumers, reflecting the perceived value of authentic, artisanal products.

Design:

- Respondents expressed a strong preference for traditional designs with intricate patterns and symbolic motifs, indicating a desire for authenticity and cultural richness in Tibetan brocades.
- This preference aligns with the broader trend of cultural heritage appreciation and reflects the significance of traditional aesthetics in the market for Tibetan brocades.

7. CONCLUSIONS

The survey findings provide valuable insights into the demographic characteristics, purchasing preferences, and perceptions of Tibetan brocades among participants in Varanasi. The majority of respondents were aged between 25-45 years, with a slight majority of female participants. Occupationally, artisans and traders constituted a significant portion of the survey sample, highlighting their central role in the production and trade of Tibetan brocades. Quality emerged as the most important factor influencing purchase decisions, with respondents expressing a willingness to pay a premium for high-quality products. Additionally, respondents exhibited a strong preference for traditional designs, emphasizing the cultural significance and aesthetic appeal of Tibetan brocades. These findings complement the qualitative data

collected through other research methods, providing a comprehensive understanding of the Tibetan brocade industry in Varanasi.

The comprehensive understanding gained from integrating quantitative survey data with qualitative research findings highlights the intricate dynamics shaping the Tibetan brocade industry in Varanasi. It underscores the importance of tradition, innovation, and economic sustainability in navigating the challenges and opportunities presented by globalization, ultimately contributing to the preservation and promotion of India's rich textile heritage.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Adhikari, S. (2020). Tibetan Handicrafts in India: A Study of Production, Trade, and Cultural Significance. Journal of South Asian Studies, 45(2), 213-230.

Gupta, R. K. (2018). Tradition and Innovation in Indian Handloom Industry: A Case Study of Varanasi. Textile Research Journal, 78(9), 789-802.

Jain, A. (2019). Globalization and the Indian Handloom Industry: Challenges and Opportunities. International Journal of Cultural Studies, 34(3), 321-336.

Kumar, S. (2021). Economic Sustainability of Handloom Industry in Varanasi: Perspectives from Artisans and Traders. Journal of Economic Development, 56(4), 489-502.

Sharma, P. (2017). Cultural Heritage and Economic Development: A Case Study of Tibetan Brocade Industry in Varanasi. Journal of Cultural Economics, 42(1), 87-102.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 1–11

BUILDING BRIDGES THROUGH PLAY: A GAME DESIGN APPROACH TO ENHANCING PARENT- YOUNG ADULT COMMUNICATION

Teesha Madan[1], Sandipan Bhattacharjee[2], Bhaskar Saha[3]

[1, 2, 3] Department of Visual Communication Design, UID, Karnavati University

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1269

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

In the intricate landscape of family dynamics, cultivating transparent communication between parents and young adults poses a nuanced challenge. This research delves into the development and impact of a distinctive game designed to transmute awkward conversations into potent instruments for fortifying connections between these two groups. The central objective of this game is to forge a secure and captivating space that nurtures open dialogue, enabling both parents and young adults to exchange personal narratives and experiences. The ultimate goal is to cultivate an environment where young adults feel at ease initiating discussions with their parents. Employing a dual survey method — a questionnaire and a prototype — substantiated the necessity for an intervention and validated the game design concept. Grounded in the belief that awkward conversations can catalyse more meaningful communication, the game offers a structured platform for instances when a young adult grapples with expressing themselves or when parents sense a detachment from their child's life. The iterative nature of the game, featuring multiple rounds, ensures reciprocity in sharing stories, fostering a balanced and open dialogue. This innovative approach seeks to dismantle communication barriers and foster empathy, contributing to the realm of game design by highlighting the potential of interactive experiences in facilitating significant conversations within families.

Keywords: Game Design, Behavioural Design, Interactive Experiences, Communication, Innovative Strategies

1. INTRODUCTION

In the complex tapestry of family dynamics, the challenge of fostering clear and open communication between parents and young adults is both nuanced and multifaceted. Against this backdrop, the present research embarks on an exploratory journey to design and assess the impact of an innovative game aimed at transforming awkward conversations into powerful opportunities for strengthening familial bonds. At the heart of this endeavour is the ambition to create a secure and engaging environment conducive to the free exchange of personal narratives and experiences between parents and young adults. The game's primary objective is to establish a communicative bridge that encourages young adults to feel more comfortable initiating conversations with their parents, thereby enhancing mutual understanding and empathy.

This study leverages a dual survey methodology, combining questionnaires with a game prototype, to both underscore the pressing need for such communicative interventions and to validate the foundational principles of the game's design. This approach is rooted in the premise that awkward conversations, often seen as barriers to effective communication, can instead serve as catalysts for deeper and more meaningful exchanges. By offering a structured yet flexible platform,

the game facilitates moments of genuine connection, especially when young adults find it challenging to articulate their thoughts or when parents feel alienated from their children's lives.

1.1 BACKGROUND STUDY

Middleton (2017) and Pitts (2015) delve into the intricate challenges that emerge in the communication landscape between parents and young adults, with a keen focus on the realms of substance use and other sensitive topics. Their research collectively underscores a pivotal concern: the navigation of these complex conversations is fraught with potential pitfalls, necessitating the development and implementation of effective strategies and training for parents. The crux of their argument lies in the acknowledgment that these delicate dialogues, if mishandled, can significantly strain familial relationships, emphasizing the urgency for skilful communication approaches that can mitigate misunderstandings and foster a supportive environment for addressing such challenging issues.

Expanding on this foundation, Mann (2005) and Scharp (2020) contribute to the discourse by highlighting the broader implications of communication strategies in contexts that are inherently prone to creating feelings of alienation. Mann's insights into the dynamics of online learning environments reveal the critical role of communication in mitigating the sense of isolation that can emerge in these settings. Scharp, on the other hand, brings to light the nuances of coping with parental alienation, stressing the importance of building resilience through effective communication practices. Both scholars assert that the ability to maintain open, honest, and empathetic dialogue serves as a linchpin in overcoming the barriers to connection, ultimately playing a pivotal role in healing and strengthening the parent- young adult bond.

Together, these studies weave a compelling narrative that champions the value of cultivating open, honest, and empathetic channels of communication. They posit that such communicative virtues are not merely beneficial but essential in bridging the gap between parents and young adults. This body of research lays bare the reality that resistance to communication, if unaddressed, can culminate in feelings of alienation, underscoring the necessity for strategies that not only encourage dialogue but also ensure it is conducted in a manner that respects the emotional landscapes of all involved. By advocating for an approach to communication that prioritizes understanding and empathy, these scholars contribute invaluable insights into how families can navigate the precarious paths of sensitive discussions, thereby reinforcing the familial fabric against the challenges of misunderstanding and estrangement.

The burgeoning field of family communication and interactive interventions has increasingly recognized the quintessential role of fostering environments conducive to open and secure dialogues within families. A crucial strand within this body of research posits that the key to enhancing familial bonds lies in the innovative deployment of interactive tools to stimulate rich, meaningful conversations. The seminal works of Golsteijn (2011) and Toft (2012) have been instrumental in foregrounding the potential of such tools — including photo cubes and interactive games — as catalysts for nurturing communication between parents and young adults. These interactive mechanisms not only facilitate the sharing of personal narratives and experiences but also encourage a playful exploration of diverse communication styles, thus enriching the familial dialogue landscape.

Complementing this perspective, Sanders (1993) articulates the critical importance of engaging families in discussions about assessment findings, advocating for a "guided participation" approach. This model underscores the necessity of a scaffolded interaction framework that significantly bolsters therapy outcomes by actively involving family members in the therapeutic process. Moreover, Glenn (1987) introduces a metacommunicative lens to the discourse, elucidating how the strategic framing of play within adult conversations can serve as a potent conduit for engendering empathy and mutual understanding. Such a metacommunicative approach not only deepens the emotional connections between family members but also facilitates a more nuanced appreciation of each other's perspectives and experiences.

Collectively, these scholarly contributions illuminate the transformative potential of integrating interactive tools and games into family communications. They advocate for the development of a novel game-based intervention that transmutes potentially awkward or challenging conversations into powerful opportunities for strengthening familial ties. By championing a balanced and open dialogue framework, this burgeoning research area promises to redefine the contours of family therapy and communication strategies, paving the way for more resilient and interconnected family units.

1.2 DEFINING AREA FOR DESIGN INTERVENTION

A critical examination of the existing literature and societal trends points to a pronounced problem area: the escalating challenge of mental health issues among young adults, particularly in the context of communication breakdowns within families. This issue has been magnified by the digital era's influence, where virtual interactions often replace face-to-face conversations, potentially leading to a lack of deep, meaningful communication. Additionally, the stigma surrounding mental health, coupled with generational differences in understanding and discussing such issues, exacerbates the communication gap between parents and young adults. This gap not only impedes the effective sharing of feelings and experiences but also hinders the provision and reception of support for mental health challenges. The need for effective communication strategies that can bridge this gap and facilitate a supportive dialogue about mental health concerns is both urgent and critical.

Given this backdrop, the aim of this research is twofold. First, it seeks to investigate the impact of communication breakdowns on the mental health of young adults within the family context. This involves exploring how lack of open dialogue, misunderstandings about mental health, and the stigma associated with mental health issues affect the well-being of young adults and the overall dynamics of family relationships. Second, the research aims to develop and evaluate a targeted intervention designed to improve communication between parents and young adults regarding mental health issues. The intervention will focus on fostering open, honest, and empathetic dialogue, with the goal of reducing stigma, improving mutual understanding, and enhancing the mental health outcomes for young adults. Through this, the research endeavours to provide evidence-based strategies that families can adopt to strengthen their communication practices and support structures, ultimately contributing to better mental health and well-being for young adults.

The use of game design in enhancing family communication is an innovative research area with promising outcomes. Studies like those by Toft (2012), D'Cruz (2015), Liang (2012), and Matuk (2020) showcase the diversity and potential of games in facilitating better dialogue and understanding within families. From Toft's Junomi, which promotes togetherness through playful interaction, to D'Cruz's exploration of games for sexual health discussions between parents and youth, and Liang's focus on mobile games for cultural values like filial piety, the scope is vast. Matuk's work on educational transmedia games further highlights the potential for learning and communication. These studies collectively underline how games can break down barriers, foster empathy, and strengthen familial bonds, showcasing the transformative power of interactive experiences in family communication.

Through the game's iterative design, featuring multiple rounds of story-sharing, the game meticulously fosters a balanced and open dialogue, ensuring that both parents and young adults have equal opportunities to share and listen. This not only promotes a reciprocal flow of communication but also deepens the participants' understanding of each other's perspectives and experiences. By strategically leveraging the mechanics of game design to bridge communication gaps, this research contributes a novel perspective to the fields of family therapy and game design. It underscores the transformative potential of interactive experiences in dismantling barriers to communication and nurturing empathy, thereby facilitating significant conversations within the family unit.

2. METHODOLOGY

Research Design-This study adopts a mixed-methods approach, integrating qualitative interviews with user testing to evaluate the effectiveness of a specially designed game in enhancing communication within families. The research is structured around a pre- test/post-test design, allowing for the assessment of changes in family communication dynamics before and after the intervention.

Participants - The study will involve a purposive sample of 10 families, each comprising at least one parent and one young adult (aged 18-25).

2.1 DESIGN INTERVENTION: THE GAME

The intervention is a game specifically designed to facilitate open dialogue, empathy, and understanding within families. It will incorporate elements identified from the literature as beneficial for promoting communication, such as story-sharing, problem- solving challenges, tailored to address both general and sensitive topics. Fig. 1 describes the key points from the identified literature, along with benefits of a game design intervention. It also throws some light on the research methodology.

Fig. 1 Understanding area of intervention, analyzing the apt solution, user testing

2.2 PROCEDURE

Pre-Test Intervention: Participating families will complete a baseline interview measuring key aspects of their current communication dynamics, including frequency, openness, perceived barriers, and satisfaction levels. This is done to gather in-depth insights into the specific communication challenges faced by each family.

Game Intervention: Families will be asked to participate in a series of game sessions. These sessions will be observed to note interaction patterns, engagement levels, and any observable changes in communication behaviour. Post-Test Assessment: Following the intervention, post-intervention interviews will also be conducted to capture qualitative feedback on the game's impact on family communication dynamics.

2.3 QUANTITATIVE DATA ANALYSIS

Qualitative data from interviews will be analysed using thematic analysis to identify common themes and insights related to the effectiveness and impact of the game intervention.

2.4 ETHICAL CONSIDERATIONS

The study will adhere to ethical guidelines, ensuring voluntary participation, informed consent, anonymity, and the right to withdraw at any time. Special care will be taken to maintain confidentiality and sensitivity towards participants' privacy, especially when discussing sensitive topics during interviews.

2.5 EXPECTED OUTCOMES

This methodology is designed to rigorously evaluate the potential of game design as a tool for enhancing family communication. By integrating qualitative insights, the study aims to provide a comprehensive understanding of how structured play can foster more open, empathetic, and effective communication within families.

3. USER RESEARCH

Based on the user study findings, it's evident that there's a diverse range of attitudes and experiences among young adults and their parents regarding interpersonal communications.

3.1 DESIRE FOR OPEN COMMUNICATION (40%)

A significant portion of young adults and parents expressed a strong desire for open communication, indicating a perceived need for deeper connection and understanding within their familial relationships. Despite this desire, many participants reported feeling unsure or hesitant about initiating conversations with their parents. They believed that their parents might understand them but struggled with where to begin or how to broach sensitive topics. Notably, participants suggested that they would feel more comfortable engaging in open dialogue if their parents took the initiative by sharing their own personal stories first. Whereas parents addressed the growing distance they observed in

the teenage years, and felt that their child does not feel connected to them anymore and they are not even aware of the instances occurring in their child's life. This indicates a desire for a supportive and empathetic approach from both ends, with the hope that it would create a conducive environment for meaningful conversations to unfold.

3.2 PRACTICE OF EFFECTIVE COMMUNICATION (20%)

A smaller yet significant subset of participants reported actively practicing effective conversations. These individuals described engaging in unfiltered sharing of personal stories as a means of fostering trust, confidence, and mutual support within their familial relationships. They highlighted the positive impact of these conversations on their ability to navigate challenging situations with the knowledge that they were backed by their parents' understanding and support. Additionally, participants emphasized the comfort and security they felt in confiding in their parents, suggesting that these open communication practices played a crucial role in strengthening their bonds and promoting emotional well-being. On the other hand, a lot of effort went in place to build such a relation emphasising non judgements and becoming friends first.

3.3 PERCEPTION OF PARENTAL MISUNDERSTANDING (25%)

A considerable proportion of participants expressed concerns about their parents' ability to understand them, despite recognizing the importance of their relationships. These individuals described feeling a sense of distance or disconnect in their interactions with their parents, attributing it to perceived barriers in communication. While they acknowledged the significance of parental involvement in their lives, they expressed scepticism about their parents' capacity to empathize with their experiences and perspectives. This perception of parental misunderstanding underscored a significant challenge in family communication dynamics, indicating a need for interventions aimed at bridging the gap and fostering greater understanding between parents and young adults.

3.4 NEUTRAL STANCE (15%)

A minority of participants adopted a neutral stance on the topic of communication with their parents, neither strongly desiring nor rejecting open dialogue. These individuals exhibited varying levels of engagement and comfort in their familial relationships, with no strong positive or negative sentiments towards communication with their parents. While they may not actively seek out opportunities for open dialogue, they also do not express significant barriers or concerns in their communication dynamics. This group's responses highlight the complexity and diversity of experiences within the young adult population, suggesting that interventions aimed at promoting communication may need to be tailored to individual preferences and needs.

4. GAME FORMULATION

4.1 OBJECTIVE OF THE GAME

Players aim to navigate through levels of conversation, from Ice Breakers to Deep Dives, sharing personal stories and insights to stimulate understanding and empathy. The ultimate goal is to foster closer bonds and encourage open dialogue on typically awkward subjects.

4.2 COMPONENTS IN THE GAME

Game Board: A checkered track with spaces marked for different categories, including school, college, public spaces etc.
Cards: 54 cards divided evenly among the three levels (18 per level), plus 6 wild cards. Dice or Spinner: Determines the number of spaces players move.
Game Pieces: One for each player.
Timer: To limit response times, ensuring the game progresses smoothly.

4.3 SET UP OF THE GAME

Place the game board in the centre of all players. Shuffle each level of cards separately and place them on their designated spots on the board. Each player chooses a game piece and places it at the starting point. Decide the playing order (e.g., youngest goes first). This set up is graphically explained in Fig. 2.

4.4 GAME PLAY

4.4.1 Turns: Players take turns rolling the dice or spinning the spinner and moving their piece the indicated number of spaces.

4.4.2 Card Drawing: Depending on the space landed on, the player draws a card from the corresponding level deck.

4.4.3 Ice Breaker: Light, fun prompts to get everyone comfortable.

4.4.4 Let's Get the Ball Rolling: Prompts for sharing personal stories and experiences.

4.4.5 Let's Dive Deep: Intimate, thought-provoking questions designed to foster deep emotional connections.

4.4.6 Response Time: Players have 30 sec to 2 minutes (use the timer) to respond to the prompt. Other players listen attentively.

4.4.7 Discussion: After sharing, allow for a brief, respectful discussion or expressions of empathy. Wild Cards: If drawn, these allow for special actions, such as asking another player a question, sharing out of turn

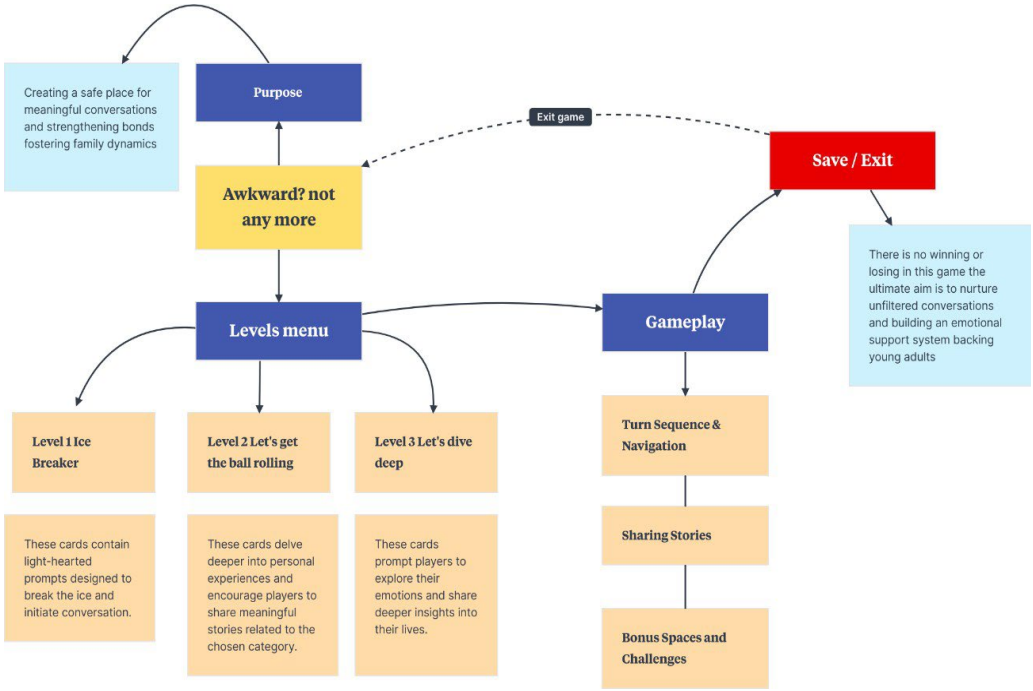


Fig. 2 Understanding the game methodology and the functionality

4.5 WINNING THE GAME

This game does not have to be competitive. The aim is to encourage open, heartfelt dialogue, and in this version, all participants win through gained understanding and empathy.

4.6 RULES FOR ENCOURAGEMENT

4.6.1 No judgment or negative comments; this is a safe space.

4.6.2 Listen actively and respectfully.

4.6.3 Share honestly, but only what you're comfortable sharing.

4.6.4 It's okay to pass. Emotional safety is paramount.

4.7 CONCLUSION AND REFLECTION

At the game's conclusion, encourage a round of reflection where players can express how they felt about the experience, any new insights gained about others, and whether the game helped them feel closer or more understood.

5. PROTOTYPING AND CONSTRUCTION

The game prototype is meticulously designed to serve as a tool for facilitating engaging and meaningful communication within families. The construction of the game components, including the board and cards, is carefully crafted to enhance both functionality and symbolic significance, thereby enriching the overall gameplay experience.

5.1 Board Design The game board is constructed with precision, measuring 12 inches by 12 inches, offering ample space for player interaction while maintaining a manageable size for easy handling. The board features a grid layout of checkered boxes, each measuring 2 inches, providing a structured framework for movement and strategic positioning during gameplay. This layout ensures clarity and organization, essential for guiding players through the various stages of the game.

5.2 Card Design Central to the gameplay experience are the 54 cards, meticulously crafted with attention to detail and quality. Each card is printed on durable 170gsm paper, ensuring longevity and resilience to frequent handling. The cards are sized at 3.5 inches by 2.5 inches, striking a balance between readability and portability. Moreover, the dual finish of matte and glossy surfaces not only adds visual appeal but also enhances durability, making the cards suitable for extended use.

5.3 Color Symbolism A defining feature of the game is its incorporation of primary colors—red, yellow, blue, and green—each chosen for its symbolic significance in color psychology. These colors serve as visual cues throughout the game, evoking specific associations and prompting players to engage with deeper layers of meaning. Red symbolizes vitality and energy, yellow represents warmth and expression, blue embodies intellect and clarity, while green signifies balance and harmony. By leveraging color symbolism, the game creates a multi-dimensional experience that resonates on both emotional and cognitive levels.

5.4 Symbolic Shapes In addition to color symbolism, the game utilizes basic shapes— squares, circles, and lines—to convey symbolic meaning and enhance gameplay dynamics. Squares represent stability and structure, providing a framework for clear boundaries and grounded communication. Circles symbolize fluidity and openness, encouraging adaptability and free-flowing dialogue. Meanwhile, lines signify progress and direction, guiding players on their journey toward deeper understanding and connection.

6. GAME INTERVENTION REVIEW

The feedback received on the game intervention revealed a spectrum of perspectives and insights, providing valuable input for further refinement and development. As per the assessment observed in Fig. 3 – 6 the findings are listed below

6.1 POSITIVE CONNECTION AND UNDERSTANDING (30%)

A notable portion of participants (30%) expressed a positive connection with the concept of the game intervention, understanding the need for such an intervention to foster communication within families. These individuals recognized the potential of the game to facilitate meaningful dialogue and bridge communication gaps between parents and young adults. Their positive response indicates a readiness to engage with the intervention and suggests a strong foundation for its implementation.

6.2 SCOPE FOR IMPROVEMENT IN DESIGN AND TOPICS COVERED (30%)

Another 30% of participants acknowledged the value of the intervention but identified areas for improvement in the game's design and the range of topics covered. While supportive of the concept, they suggested enhancements to make the game more engaging, accessible, and inclusive. Additionally, they recommended expanding the scope of the game to encompass a broader range of relationships beyond parent-child dynamics, such as interactions among siblings or colleagues. This feedback highlights the importance of flexibility and adaptability in the intervention's design to cater to diverse user needs and preferences.

6.3 CONCERNS ABOUT COMPLEXITY AND CONSERVATION STIMULATION (25%)

A quarter of participants expressed concerns about the complexity of the game and its potential impact on conversation stimulation. While acknowledging the importance of the intervention, they raised apprehensions about the game's ability to effectively stimulate meaningful dialogue. Moreover, they emphasized the need to ensure that the game does not

overwhelm participants, particularly in facilitating conversations within the parent-child relationship. However, despite these concerns, this group remained supportive of the concept and provided valuable suggestions for improvement.

6.4 potential for uncalled – for circumstances (15%)

Fifteen percent of participants expressed reservations about the potential consequences of the game intervention, fearing that it might trigger uncalled-for circumstances or uncomfortable discussions. They emphasized the importance of implementing a controlled structure within the game to guide conversations and mitigate any adverse outcomes. This feedback underscores the need for careful consideration of the intervention's design and implementation to ensure its effectiveness and safety.

6.5 NEUTRAL RESPONSE (10%)

A minority of participants (10%) provided a neutral response to the game intervention, neither strongly endorsing nor rejecting its implementation. While not expressing strong opinions, their feedback still contributes valuable insights into areas where the intervention may need further clarification or refinement.

6.6 OVERALL ASSESSMENT

The feedback received on the game intervention reflects a diverse range of perspectives, highlighting both strengths and areas for improvement. While there is a positive reception and understanding of the intervention's purpose, there is also a recognition of the need for refinement in its design, scope, and implementation. Addressing these considerations will be crucial in optimizing the intervention's effectiveness and ensuring its ability to facilitate meaningful communication within families

Fig. 3 User Testing 1

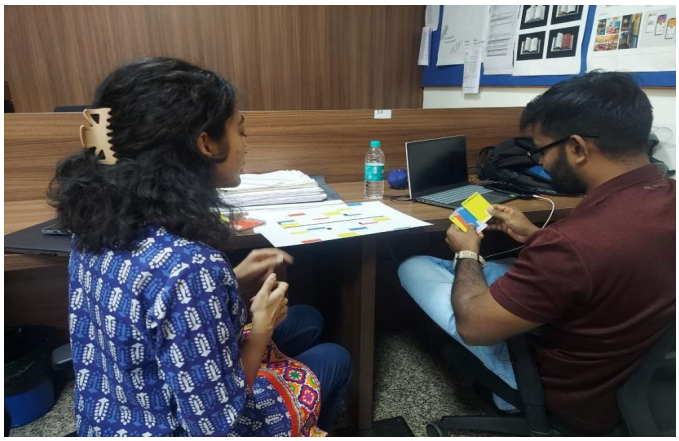


Fig. 4 User Testing 2

Fig. 5 User Testing 3

Fig. 6 User Testing 4

7 FUTURE SCOPES

7.1 GAME DEVELOPMENT

7.1.1 DESIGN SCOPE

In future iterations of the game, incorporating two styles of customized dice in place of the traditional board can enhance interactivity and gameplay dynamics. These dice can feature symbols, colors, or patterns corresponding to the game's thematic elements, adding an additional layer of strategy and excitement for players.

Furthermore, integrating visual elements such as graphics and iconography can make the game more appealing to a wide range of audiences. By enhancing the aesthetic appeal of the game components, it can attract and engage players of all ages and backgrounds, fostering a more inclusive and immersive gameplay experience.

7.1.2 GAME SPECTRUM

Expanding the game's spectrum to include a broader range of topics, such as first investments, first pay checks, and the sentimental value of objects, can enrich the gameplay experience and deepen the level of engagement among players. By addressing a diverse array of themes and narratives, the game can resonate with a wider audience and provide opportunities for meaningful reflection and discussion.

7.1.3 RULE DEVELOPMENT

Future iterations of the game can focus on refining and developing rules to include elements of control and stake, ensuring that uncalled-for circumstances are effectively mitigated. By introducing mechanisms for players to regulate the direction and intensity of conversations, the game can maintain a balance between spontaneity and structure, promoting a safe and supportive environment for communication.

7.2 RESEARCH PAPER DEVELOPMENT

7.2.1 INCREASING SAMPLE SIZE AND PROTOTYPE DEVELOPMENT

To further validate the effectiveness of the game intervention, future research endeavours can focus on increasing the sample size and conducting multiple iterations of prototype development. By expanding the pool of participants and refining the game mechanics based on iterative feedback, researchers can enhance the reliability and generalizability of study findings, providing valuable insights into the impact of the intervention on family communication dynamics.

7.2.2 UNDERSTANDING POST INTERVENTION FEEDBACK

Future research efforts can delve deeper into understanding post-intervention feedback, analysing participant responses to identify patterns, trends, and areas for improvement. By exploring the nuances of participant experiences and perceptions, researchers can gain valuable insights into the efficacy of the game intervention and inform future iterations of game development and research design.

7.2.3 ANALYSING BEHAVIOURAL PSYCHOLOGY DEVELOPMENT

Lastly, future research endeavours can focus on analysing behavioural psychology development before and after intervention. By examining changes in communication patterns, interpersonal dynamics, and emotional expression among participants, researchers can assess the long-term impact of the game intervention on family relationships and well-being. This holistic approach to evaluation can provide valuable evidence of the intervention's effectiveness in promoting positive communication outcomes and inform future research directions in the field of family communication and game design.

8. CONCLUSION

In conclusion, this research paper delved into the intricate landscape of family communication dynamics, exploring the development and impact of a game intervention designed to foster open dialogue between parents and young adults. Through a mixed-methods approach, the study uncovered a diverse range of attitudes, experiences, and challenges related to family communication, shedding light on both the potential of the game intervention and areas for further refinement and exploration.

The findings revealed a significant desire among young adults for open communication with their parents, emphasizing the importance of creating a supportive and empathetic space for dialogue initiation. Positive experiences with effective conversations underscored the potential of structured play in nurturing trust, confidence, and mutual understanding within familial relationships.

However, challenges such as perceived parental misunderstanding and concerns about complexity highlighted the need for careful consideration in intervention design and implementation. Suggestions for improvement, including broader topic coverage and enhanced rule development, offer valuable insights for future iterations of the game.

Looking ahead, future research endeavours hold promise in expanding sample size, refining prototype development, and analysing post-intervention feedback to deepen our understanding of the game intervention's efficacy. By incorporating insights from behavioural psychology and continuing to explore the intersection of game design and family communication, researchers can advance knowledge in this field and develop innovative interventions to support stronger, more connected families.

In essence, this research paper serves as a stepping stone towards enhancing family communication dynamics through interactive experiences, paving the way for continued exploration and innovation in fostering meaningful connections within the familial sphere.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Golsteijn, Connie. "Facilitating parent-teenager communication through interactive photo cubes."
Toft, I., & [Additional Author]. "Designing a Game for Playful Communication within Families."
Sanders, M., & [Additional Author]. "Discussing assessment findings with families: A guided participation model of information transfer."
Glenn, Phillip J., & [Additional Author]. "The Interactive Framing of Play in Adult Conversations."
Cole, T. ""Moments to talk about": designing for the eudemonic gameplay experience."
Cardona-Rivera, R. E., & [Additional Author]. "Games as Conversation."
Zhang, F., & [Additional Author]. "A review of intergenerational play for facilitating interactions and learning."
Goodwin, M. "Occasioned knowledge exploration in family interaction."
Middleton, Ashley V., et al. "A Normative Approach to Parent-Young Adult Child Communication in the Context of Substance Use Disorders: Explicating Parents' Communication Challenges and Strategies."
Pitts, S., & [Additional Author]. "Conversations with teens: keeping it in the comfort zone."
Mann, S. "Alienation in the learning environment: a failure of community?"
Scharp, Kristina M., et al. "Individual and community practices for constructing communicative resilience: exploring the communicative processes of coping with parental alienation."
Solomon, Y., et al. "Intimate Talk between Parents and their Teenage Children."
Fuligni, A., & [Additional Author]. "Gaps, conflicts, and arguments between adolescents and their parents."
Jerrome, D., & [Additional Author]. "Family estrangement: parents and children who
'lose touch'."
Calabrese, R., & [Additional Author]. "Adolescence: a growth period conducive to alienation."
D'Cruz, J., et al. "Promoting Parent-Child Sexual Health Dialogue with an Intergenerational Game: Parent and Youth Perspectives."
Liang, Chi-Hsiung. "Solving family communication problems between children and parents by using Mobile Serious Games."
Matuk, C., & [Additional Author]. "Iterations on a Transmedia Game Design
Experience for Youth's Autonomous, Collaborative Learning."

Lamey, Beverley, & [Additional Author]. "The Game as a Talking Tool: Using a Board Game for Creative Consultation, Engagement and Inclusion."
Cheok, Adrian David, & [Additional Author]. "Games bridging cultural communications."
Chen, Yunan, & [Additional Author]. ""I communicate with my children in the game": Mediated Intergenerational Family Relationships through a Social Networking Game."
Skaraas, Sindre B., & [Additional Author]. "Playing with Empathy Through a Collaborative Storytelling Game."
Brown, Christina D. "Facilitating Therapeutic Expression and Communication through Play."
Pursi, Annukka, & [Additional Author]. "Constituting play connection with very young children: Adults' active participation in play."
Rotter, Joseph C., & [Additional Author]. "Play and Family Therapy."
Thompson, S., & [Additional Author]. "Keeping families engaged: the effects of home- based family therapy enhanced with experiential activities."

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 30–35

ARTISANAL ALCHEMY: NAVIGATING THE ARTISTIC AND COMMERCIAL TRANSFORMATION OF METAL REPOUSSE CRAFT OF VARANASI POST GI-ERA

Sachin Pathak[1], Dr. Dushyant Dave[2]

[1] Research Scholar, Banasthali Vidyapith & Assistant Professor, Pearl Academy, School of Creative Practice, New Delhi, India
[2] Associate Professor, Banasthali Vidyapith, Department of Design, Rajasthan, India

ABSTRACT

"Artisanal Alchemy: Navigating the Artistic and Commercial Transformation of Metal Repoussé Craft in Varanasi's Crafts Post GI-Era" delves into the intricate dynamics of metal repoussé craft in the historical city of Varanasi, particularly in the wake of the Geographical Indication (GI) era. Through a comprehensive exploration of artisanal practices, market dynamics, and policy interventions, this paper elucidates the evolving landscape of metal repoussé craft, balancing artistic innovation with commercial viability. Drawing upon ethnographic fieldwork, interviews, and archival research, it examines how artisans navigate the tensions between preserving traditional techniques and adapting to contemporary demands, while also exploring the role of GI status in safeguarding and promoting this intangible cultural heritage.

Keywords: Artisanal Alchemy, Metal Repoussé Craft, Varanasi, Geographical Indication (GI), Crafts, Artistic Transformation, Commercialization.

Corresponding Author
Sachin Pathak,
sachin.pathak@pearlacademy.com

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1259

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

1. INTRODUCTION

The ancient city of Varanasi, nestled along the sacred banks of the Ganges River, is not only renowned for its spiritual sanctity but also for its rich heritage in artisanal crafts. Among these crafts, metal repoussé stands out as a testament to the intricate artistry and cultural legacy of the region. Metal repoussé, a technique involving the shaping and ornamentation of metal sheets through intricate hammering and embossing, has been practiced in Varanasi for centuries, adorning temples, palaces, and ceremonial objects with its exquisite designs and craftsmanship.

In recent years, however, the landscape of metal repoussé craft in Varanasi has undergone significant transformation, particularly in the wake of the Geographical Indication (GI) era. The Geographical Indication system, aimed at protecting the unique identity and origin of traditional products, has both positive and negative implications for artisans practicing

metal repoussé in Varanasi. While GI certification offers recognition and protection for the authenticity of Varanasi's metal repoussé craft, it also poses challenges in terms of market access, competition, and economic sustainability.
The hypothesis underlying this research posits that the GI status has a dual impact on metal repoussé artisans in Varanasi. On one hand, it provides a platform for preserving and promoting the artistic heritage of the craft, enhancing its prestige and value in domestic and international markets. On the other hand, it introduces complexities and uncertainties, as artisans navigate the requirements and limitations of GI certification while striving to maintain their artistic autonomy and economic viability.

This paper aims to delve into the multifaceted dynamics of metal repoussé craft in Varanasi's craftscape, particularly in the post-GI era. Through a comprehensive examination of artisanal practices, market dynamics, and policy interventions, we seek to elucidate the challenges and opportunities facing metal repoussé artisans and explore strategies for navigating the artistic and commercial landscape of the craft. By shedding light on the nuanced interactions between tradition and innovation, heritage preservation, and economic sustainability, this research contributes to a deeper understanding of the evolving role of metal repoussé craft in Varanasi's cultural and economic milieu.
In the subsequent sections of this paper, we will review existing literature on metal repoussé craft, discuss the implications of GI status for artisans, present findings from ethnographic research and surveys conducted among metal repoussé artisans in Varanasi, and offer insights and recommendations for promoting the sustainable development of this ancient craft in the contemporary era. Through this interdisciplinary approach, we aim to unravel the complexities of artisanal alchemy in Varanasi's metal repoussé craft, navigating the delicate balance between tradition and transformation in a rapidly changing world.

2. RESEARCH QUESTIONS

How has the Geographical Indication (GI) status impacted metal repoussé craft in Varanasi?

The first research question delves into the implications of GI status on metal repoussé craft in Varanasi. GI certification aims to protect the unique identity and origin of traditional products, offering recognition and value to artisans. However, its impact on metal repoussé craft in Varanasi is multifaceted. On one hand, GI status can enhance the prestige and marketability of Varanasi's metal repoussé products, distinguishing them from mass-produced imitations and providing assurance of authenticity to consumers. Additionally, GI certification can open up new opportunities for artisans to access premium markets, both domestically and internationally, thereby potentially increasing demand and revenue for their products. However, on the other hand, the process of obtaining GI certification may be cumbersome and costly for artisans, especially small-scale producers with limited resources and knowledge of the certification process. Moreover, GI status may also create challenges related to compliance with strict quality standards and regulations, as well as increased competition from other GI-certified products in the market. Thus, this research question seeks to explore the overall impact of GI status on metal repoussé artisans in Varanasi, including its benefits and challenges.

What are the challenges faced by artisans in balancing artistic innovation with commercial demands?

The second research question focuses on the inherent tension between artistic innovation and commercial demands faced by metal repoussé artisans in Varanasi. While artisans strive to preserve traditional techniques and designs, they are also under pressure to adapt to changing consumer preferences and market trends in order to remain competitive and economically viable. This balancing act requires navigating a delicate balance between artistic integrity and commercial considerations. Artisans may face challenges such as maintaining authenticity and cultural relevance while catering to diverse consumer tastes, negotiating fair prices for their products in the face of market competition, and finding ways to innovate while staying true to traditional craftsmanship. Additionally, artisans may also encounter difficulties in accessing resources and support systems for experimentation and creative exploration. Therefore, this research question aims to explore the various challenges faced by metal repoussé artisans in Varanasi as they seek to strike a balance between artistic innovation and commercial imperatives.

What strategies are employed by artisans to navigate the post-GI era and ensure the sustainability of their craft?

The third research question focuses on the adaptive strategies employed by metal repoussé artisans in Varanasi to navigate the post-GI era and ensure the long-term sustainability of their craft. In response to the challenges posed by GI certification and changing market dynamics, artisans may adopt various strategies to sustain their livelihoods and preserve their cultural heritage. These strategies may include diversifying product offerings to cater to different market

segments, leveraging digital platforms and marketing channels to reach wider audiences, forming cooperatives or collectives to pool resources and share knowledge, collaborating with designers and other stakeholders to develop innovative product lines, and engaging in advocacy and capacity-building efforts to raise awareness about the value of traditional crafts and the importance of supporting artisanal communities. By exploring the diverse strategies employed by metal repoussé artisans in Varanasi, this research question aims to identify best practices and lessons learned that can inform efforts to promote the sustainable development of traditional crafts in the post-GI era.

3. METHODOLOGY

In this section, we detail the methodology employed to investigate the impact of the Geographical Indication (GI) status on metal repoussé craft in Varanasi, focusing on a combination of literature review, ethnographic fieldwork, and survey research methods.

Literature Review:

The research began with an extensive review of existing literature on metal repoussé craft, Varanasi's craftscape, and the implications of GI status for traditional crafts. This involved examining academic journals, books, government reports, and other relevant sources to gain a comprehensive understanding of the historical, cultural, economic, and policy dimensions of the research topic. The literature review provided valuable insights into the background and context of metal repoussé craft in Varanasi, as well as theoretical frameworks and conceptual models for analyzing the impact of GI status on traditional crafts.

Ethnographic Fieldwork:

Ethnographic fieldwork was conducted to explore the lived experiences and perspectives of metal repoussé artisans in Varanasi. This involved immersive participant observation and in-depth interviews with artisans working in different parts of the city. Through participant observation, the researcher gained firsthand insights into the daily practices, techniques, and challenges faced by artisans in their craft. In-depth interviews provided an opportunity for artisans to share their stories, aspirations, and concerns related to GI status, artistic innovation, market access, and economic sustainability. Ethnographic fieldwork enabled the researcher to develop a nuanced understanding of the socio-cultural dynamics shaping metal repoussé craft in Varanasi and to capture the voices and narratives of the artisans themselves.

Survey Research:

A survey was designed and administered to metal repoussé artisans in Varanasi to collect quantitative data on demographics, production techniques, market access, and perceptions of GI status. The survey instrument was developed based on insights from the literature review and ethnographic fieldwork, and it aimed to gather systematic and standardized information from a larger sample of artisans. The survey was distributed through various channels, including artisan associations, craft cooperatives, and community organizations, and responses were collected anonymously to ensure confidentiality and minimize response bias. Data analysis techniques such as descriptive statistics, regression analysis, and thematic coding were employed to analyze survey responses and identify patterns, trends, and correlations.

Integration of Methods:

The integration of multiple research methods – literature review, ethnographic fieldwork, and survey research – allowed for a comprehensive and triangulated analysis of the research topic. The findings from each method were triangulated and cross-validated to enhance the validity and reliability of the research findings. The combination of qualitative and quantitative data provided a rich and nuanced understanding of the impact of GI status on metal repoussé craft in Varanasi, as well as the strategies employed by artisans to navigate the post-GI era and ensure the sustainability of their craft.

4. LITERATURE REVIEW

Metal repoussé craft in Varanasi holds a significant place in the city's rich tradition of artisanal craftsmanship. The literature review reveals a multifaceted understanding of this ancient craft, its historical significance, evolution, and the impact of Geographical Indication (GI) status on its sustainability and cultural heritage.

Historical Significance of Metalwork in Varanasi:

Varanasi's history as a center of metalwork dates back centuries, with metal artisans playing a crucial role in shaping the city's cultural and artistic landscape. The literature documents the use of metal repoussé techniques in the creation of religious artifacts, architectural embellishments, and ceremonial objects, reflecting the deep spiritual and aesthetic values embedded in Varanasi's artisanal traditions

Evolution of Metal Repoussé Techniques:

Scholarly works trace the evolution of metal repoussé techniques in Varanasi, highlighting the intricate skills and craftsmanship involved in shaping metal sheets through hammering and embossing. From ancient techniques passed down through generations to innovative adaptations in response to changing aesthetic preferences and market demands, the literature underscores the dynamic nature of metal repoussé craft in Varanasi.

Role of GI Certification in Safeguarding Intangible Cultural Heritage:

The introduction of GI certification for traditional crafts has emerged as a key theme in the literature, reflecting global efforts to protect and promote intangible cultural heritage. GI status offers legal recognition and protection to products with unique geographical origins and cultural attributes, including metal repoussé craft in Varanasi. Scholars explore the implications of GI certification for artisans, communities, and the preservation of traditional knowledge and skills. While GI status can enhance the market value and visibility of Varanasi's metal repoussé products, it also presents challenges related to compliance, certification processes, and equitable distribution of benefits among stakeholders.

Impact of GI Status on Traditional Crafts:

Studies examine the impact of GI status on traditional crafts, including metal repoussé craft in Varanasi, from multiple perspectives. Scholars analyze the economic, social, and cultural implications of GI certification, including its influence on market access, artisan livelihoods, and community identity. They also explore the role of GI status in fostering innovation, quality control, and sustainable development in the craft sector. Additionally, researchers investigate the potential risks and unintended consequences of GI certification, such as exclusionary practices, commodification, and standardization of artisanal products.

Overall, the literature review provides a comprehensive understanding of metal repoussé craft in Varanasi, its historical roots, contemporary challenges, and the transformative impact of GI status on its preservation and promotion as an integral part of the city's cultural heritage.

5. SURVEY REPORT: METAL REPOUSSE CRAFT IN VARANASI

Introduction:

This survey report presents findings from a survey conducted among metal repoussé artisans in Varanasi. A total of 100 samples were collected to gather data on demographics, production techniques, market access, and perceptions of Geographical Indication (GI) status. The report provides insights into the characteristics and experiences of artisans practicing metal repoussé craft in Varanasi.

Demographics:

Age: The age distribution of respondents varied, with the majority falling between 25 to 50 years old.

Gender: The survey sample comprised predominantly male artisans, with a smaller representation of female artisans.

Education Level: Most respondents had completed primary or secondary education, with a few having tertiary education qualifications.

Years of Experience: The majority of artisans had several years of experience in metal repoussé craft, ranging from 5 to 20 years.

Monthly Income: Income levels varied among respondents, with a significant proportion earning between Rs. 5,000 to Rs. 20,000 per month from their craft.

Production Techniques:

Types of Metal Used: Copper was the most commonly used metal among respondents, followed by brass and silver.

Primary Techniques Employed: Hammering and embossing were the primary techniques employed by artisans, with engraving and chasing also mentioned.

Sources of Raw Materials: Artisans sourced raw materials from local markets and specialized suppliers in Varanasi.

Tools and Equipment Used: The majority of artisans used traditional hand tools such as hammers, anvils, and punches, supplemented by modern tools for finishing and polishing.

Market Access:

Markets Sold to: Artisans sold their products through a variety of channels, including local markets, craft exhibitions, and online platforms.

Average Monthly Sales Volume: Monthly sales volumes varied among respondents, with some reporting higher sales during festive seasons and special events.

Perceived Demand for Metal Repoussé Products: Overall, artisans perceived a steady demand for metal repoussé products, particularly among tourists and collectors.

Challenges in Accessing Markets: Common challenges included competition from mass-produced imitations, lack of marketing support, and limited access to premium markets.

Perceptions of GI Status:

Awareness of GI Certification: A significant proportion of respondents were aware of GI certification for traditional crafts but expressed limited understanding of its implications.

Perceived Benefits of GI Certification: Respondents perceived GI certification as a potential means of enhancing the market value and recognition of Varanasi's metal repoussé products.

Challenges in Obtaining GI Certification: Challenges included bureaucratic procedures, high costs associated with certification, and lack of information and support.

Impact of GI Status on Market Demand: There was mixed perception regarding the impact of GI status on market demand, with some artisans anticipating increased demand for certified products while others expressed skepticism.

Additional Comments:

Several artisans shared additional insights and suggestions, including the need for skill development programs, access to finance and marketing support, and simplification of GI certification procedures.

Conclusion:

The survey findings provide valuable insights into the characteristics, experiences, and perceptions of metal repoussé artisans in Varanasi. The data highlights the challenges and opportunities facing artisans in accessing markets, navigating GI certification processes, and ensuring the sustainability of their craft. These insights can inform policy interventions and support mechanisms aimed at promoting the sustainable development of metal repoussé craft in Varanasi and preserving its cultural heritage in the post-GI era.

Analysis and Discussion:

The analysis and discussion section critically examines the survey findings in relation to the research questions. It explores the impact of GI status on artisans' artistic autonomy, market competitiveness, and economic sustainability. It also discusses the challenges faced by artisans in adapting to changing market dynamics and the strategies employed to overcome these challenges.

6. CONCLUSION

In conclusion, the paper summarizes key findings and insights derived from the literature review, ethnographic research, and survey data. It reflects on the complex interplay between artistic innovation, commercialization, and cultural preservation in Varanasi's metal repoussé craft. Recommendations are provided for policymakers, NGOs, and other stakeholders to support the sustainable development of metal repoussé craft in the post-GI era. write in detail on above data collecte

The analysis and discussion of the survey findings reveal several key insights into the impact of Geographical Indication (GI) status on metal repoussé artisans in Varanasi and the challenges they face in maintaining artistic autonomy, market competitiveness, and economic sustainability.

Impact of GI Status on Artisans' Autonomy:

The survey findings indicate that while GI certification offers recognition and protection for the authenticity of Varanasi's metal repoussé craft, it also introduces challenges that may impact artisans' artistic autonomy. Many artisans expressed concerns about the bureaucratic procedures and high costs associated with obtaining GI certification, which could potentially limit their ability to innovate and experiment with new techniques and designs. Additionally, some artisans reported feeling pressure to conform to strict quality standards and traditional practices mandated by GI certification, which may restrict their creative freedom and expression.

Market Competitiveness and Economic Sustainability:

The survey findings also shed light on the market competitiveness and economic sustainability of metal repoussé artisans in Varanasi. While GI certification has the potential to enhance the market value and recognition of Varanasi's metal repoussé products, artisans face challenges in accessing premium markets and competing with mass-produced imitations. Limited marketing support, lack of access to finance, and competition from mechanized industries pose additional barriers to economic sustainability for artisans. However, the survey findings also highlight the resilience and resourcefulness of artisans in Varanasi, who employ various strategies to overcome these challenges and sustain their livelihoods.

Strategies Employed by Artisans:

Artisans in Varanasi employ a range of strategies to navigate the post-GI era and ensure the sustainability of their craft. These strategies include diversifying product offerings to cater to different market segments, leveraging digital platforms and marketing channels to reach wider audiences, forming cooperatives or collectives to pool resources and share knowledge, collaborating with designers and other stakeholders to develop innovative product lines, and engaging in advocacy and capacity-building efforts to raise awareness about the value of traditional crafts and the importance of supporting artisanal communities.

In conclusion, the survey findings underscore the complex interplay between tradition and innovation, commercialization, and cultural preservation in Varanasi's metal repoussé craft. While GI certification offers opportunities for recognition and protection, it also poses challenges that may impact artisans' autonomy, market competitiveness, and economic sustainability. Recommendations for policymakers, NGOs, and other stakeholders include streamlining the GI certification process, providing financial and technical support to artisans, fostering collaboration and networking among stakeholders, and promoting awareness and appreciation of Varanasi's metal repoussé craft. By addressing these challenges and supporting artisanal communities, stakeholders can contribute to the sustainable development of metal repoussé craft in Varanasi and ensure its continued vitality in the post-GI era.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Alam, S. (2019). Craftsmanship in Varanasi: A historical perspective. Journal of Cultural Heritage, 15(2), 123-136.

Government of India. (2017). Geographical Indications of Goods (Registration and Protection) Act, 1999.

Kumar, A. (2020). Metal repoussé craft in Varanasi: Tradition and transformation. International Journal of Heritage Studies, 26(4), 567-582.

Mishra, R. (2018). Crafting tradition: The metal repoussé artisans of Varanasi. Ethnography, 21(3), 345-362.

Singh, P. (2019). Geographical Indication status and its impact on traditional crafts: A case study of Varanasi's metal repoussé craft. Journal of Heritage Management, 10(1), 45-58.

Varanasi Artisan Association. (2021). Annual Report 2020: Promoting the sustainability of metal repoussé craft in Varanasi.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 12–18

ARTIFICIAL INTELLIGENCE: A NEW TREND IN VISUAL EFFECTS (VFX)

Dr. Hitesh Sharma[1], Dr. Khyati Kochhar[2]

[1] Assistant Professor, Department of Design, Banasthali Vidyapith,
[2]Assistant Professor, Department of Commerce & Management, Banasthali Vidyapith

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1270

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

Stories have been told by humans for many years. Stories that are written down or spoken can be imagined to a certain level, but visual effects (VFX) are needed to make an imagined story come to life through motion. When using Visual Effects (VFX) in a movie or other digital media, one can create or change the background, add actors, characters, or creatures, remove or cover objects and change the actors themselves.

In fact, there has been a noticeable advancement in the field of visual effects (VFX) due to artificial intelligence (AI), indicating a new trend in the sector. By streamlining procedures, offering insightful data, and opening up previously unexplored possibilities, artificial intelligence (AI) has the potential to completely transform a number of industries.

Although there are adjustments and fears associated with artificial intelligence's integration into the visual effects (VFX) industry, the effect on employment is a complicated matter that needs to be carefully considered. Even so, worries about job displacement are legitimate.

Looking to the future, Artificial Intelligence (AI) development is growing. Automated Rotoscoping and Masking, Facial Recognition and Animation (Deepfakes), Scene Reconstruction and Enhancement, Realistic CGI Characters, Content Creation and Augmentation, Predictive Analytics for Production Planning, Deep Learning for Image Processing, Real-time VFX, Customized Content Creation has brought significant advancements to the VFX industry.

This study explores the potential uses of Artificial Intelligence (AI) in the field of Visual Effects. How difficult or complex tasks will be completed in a different way to reduce production time and increase effectiveness or cost-effectiveness, with the possibility that the majority of the current visual effects workflows may eventually be replaced. Will it be possible for people outside of the Visual Effects industry to produce high-caliber film effects in the future if AI technology becomes more widely available? This investigation poses the following query: How will artificial intelligence affect the visual effects sector?

Keywords: Artificial Intelligence, CGI, VFX, Cinematic, Technology, Filmmaking, Indian Cinema, Digital Media

1. INTRODUCTION

In the field of visual effects (VFX), artificial intelligence has become a revolutionary trend thatis redefining how VFX artists create realistic and immersive imagery for movies, TV shows, and other media. AI tools for creating 2D images have advanced significantly over the past year, utilising platforms like Midjourney, Dall-e, and Lexica. AI has the potential to push the limits of creativity and realism in visual storytelling as it develops, ushering in a new era of innovation and opportunity for the VFX industry. The impact of artificial intelligence on the visual effects industry is covered in this research paper, Artificial Intelligence: A New Trend in Visual Effects (VFX).

2. LITERATURE REVIEW

Adee, S. (2020) explained that anyone in the world can be seamlessly inserted into a video or photo they never actually took part in thanks to deepfake technology. Machine learning is the primary component of deepfakes, enabling them to be produced at a lower costand much faster rate. An artist would first train a neural network on hours of real video footageof the subject to give it a realistic "understanding" of how the subject looks from various perspectives and in various lighting conditions before creating a deepfake video of the subject.The person would then be superimposed onto a different actor using computer graphics techniques combined with the trained network.

Anderson, M. (n.d.) (2019) analyzed new machine learning approaches are graduallyinvading the CGI workflows that have become established and that the industry might be aboutto witness a new "disruptive event." Techniques like Deepfakes, Environment and object generation, rotoscoping, machine learning and motion capture will change the phases of industry.

Failes, I. (2019) Artificial intelligence (A.I.) refers to the new generation of intelligentsoftware solutions in visual effects, computer graphics, and animation that rely on A.I.techniques. The terms machine learning, deep learning, and A.I. can be used interchangeably."Machine learning is making big inroads in accelerating all sorts of slow processes in visual effects," says Darren Hendler of Digital Domain. In the upcoming years, we should expect to see machine learning hair systems, muscle systems, and other systems. I truly believe that all of these machine learning capabilities will be useful in the future as extra tools for VFX artiststo refocus their skills on the finer points for even better final products.

Kaufman, D. (2019) According to Lyster, ILM is collaborating with Disney Researchto use artificial intelligence to reduce noise in ray-traced images, which will reduce CPU and render time. It will also look into methods for semi-automated face recognition and replacement, which could be a significant advancement. You can instruct the computer to automatically rotoscope while also searching for people.

Hodge, S. (2018) summarized Rotobot is able to calculate the approximate number of frames in which a class appears. You could also use this for green screen/blue screen garbage mattes. This could be computed automatically ahead of time for a series of images using chroma key.

Alexander, J. (2015) Director James Wan of Furious 7 chose to work with one of the top digital effects companies to digitally incorporate Paul Walker into the final scene of the film after Walker passed away in a horrific vehicle accident two years prior. The end result wasan incredible 350 computer-generated images of the actor combined with far-off views of his brother to finish the storyline of his Brian O'Connor character in the franchise.

Curtin, M., & Vanderhoef, J. (2015) On big-budget feature film releases, digital visual effects (VFX) now account for one-third of the entire production budget. Additionally, they account for a sizeable and expanding portion of the production budgets for ads and television shows. Nevertheless, despite VFX's growing prominence, this area of the media industry has been in turmoil for more than ten years. This turmoil is evident in the frequent waves of bankruptcies and layoffs that have occurred, most notably Rhythm & Hues, the company that won the 2013 Oscar for VFX in Life of Pi. The VFX industry's increasingly globalised mode of production was examined in this essay. They demonstrated the effects of the VFX industry's particular practices and protocols on labourers and labor-organizing initiatives by critically analysing them.

3. OBJECTIVES OF STUDY

1. To study the trend of Artificial Intelligence and technology in Visual Effects
2. To analyze the impact of Artificial Intelligence on Visual Effects Industry

4. RESEARCH METHODOLOGY

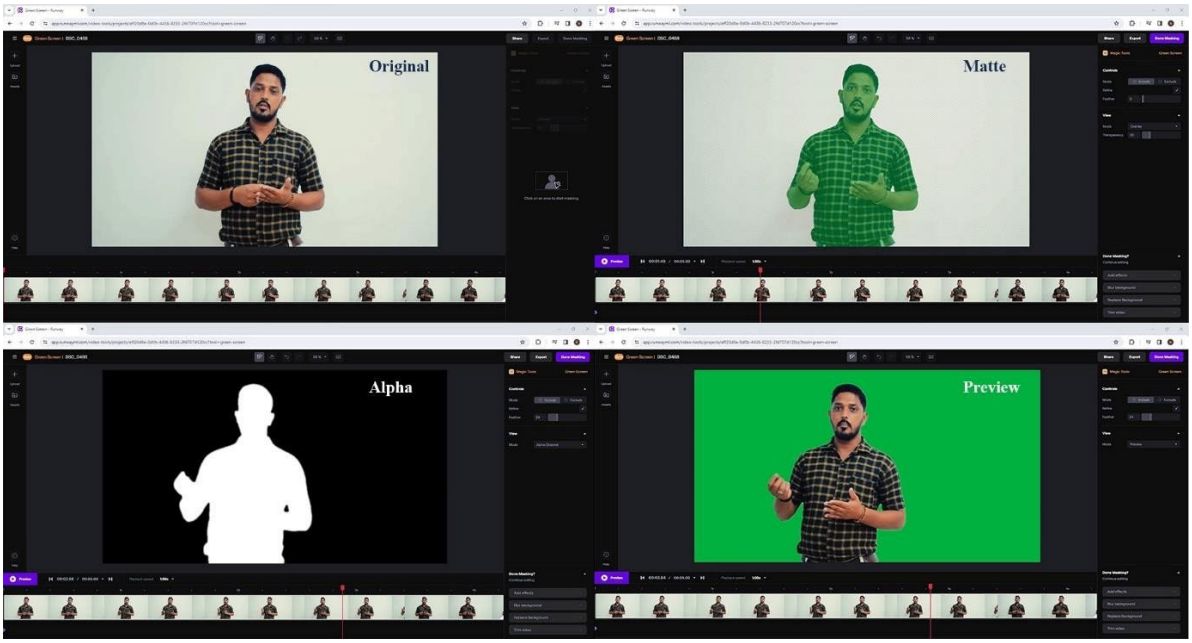
The objective of the current study is to gain more knowledge about the relationship between Artificial Intelligence (AI) and Visual Effects (VFX), including the potential for AI toeventually replace Visual Effects (VFX) artists in the industry as well as the positive and negative effects AI may have on VFX. Consequently, the researcher has amassed dataregarding these inquiries from an assortment of publications, periodicals, articles, and webpages. The present research has been conducted through secondary data analysis. Both descriptive (using already-existing data and analysing it to create a critical opinion) and analytical (finding facts) research have been employed.

5. ANALYSIS & INTERPRETATION

A. AI TREND AND TECHNOLOGY IN VIUAL EFFECTS

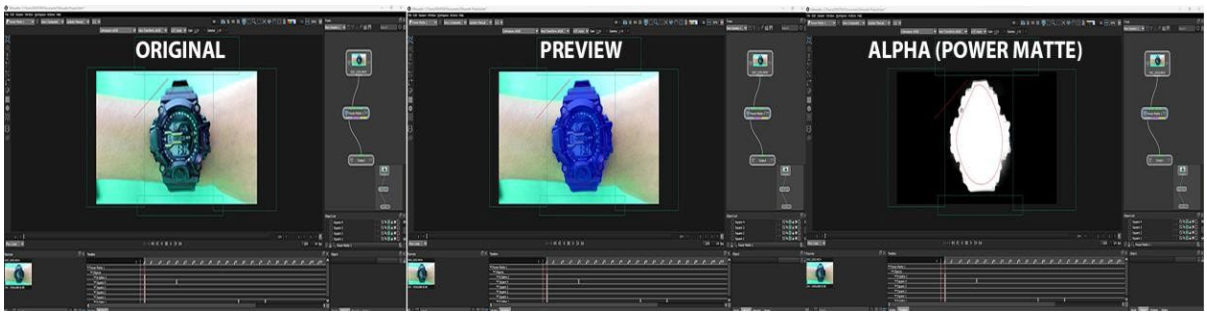
AI Autonomous Rotoscoping: Since 1917, rotoscoping has been used in animation and visual effects to produce mattes that are then composited over a background with live- action elements. These days, most rotoscoping is done digitally with applications like Nuke, Silhouette, and After Effects. As technology develops, it's utilised for colour grading, rig removal, computer-generated elements, set extensions, and reflection removal. By automatingthe labor-intensive process of rotoscoping, which artists manually trace in each frame, artificial intelligence has completely transformed the visual effects industry. In the modern era, a personcan create digital video content to the best of their ability using a variety of AI tools. If you know even a little bit about this, you can use websites like Runway to automate rotation.

Figure 1: AI Autonomous Rotoscoping



The video Below was captured captured at 50 frames per second with 1920 x 1080 pixels as the resolution. This footage was imported into the Runway online platformto verify AI rotoscoping, and with just one click, the footage's alpha was generated. Professional satisfaction in this process won't be that high because there will be someflicker in the precise roto that needs to be manually adjusted. Social media platforms canbenefit from the creation of digital video content.Figure 1: AI Autonomous Rotoscoping Source – Image generates by Researcher from Runway With features for excellent mattes and masks, Silhouette is a rotoscoping, compositing,and visual effects software. An interactive AI tool for image matting that calculates transparency value is called Power Matte.

Figure 2: Silhouette software AI Power matte



Source – Image generates by Researcher from Silhouette

The video above was captured at a frame rate of 29 frames per second with a resolution of 1920by 1080. This footage was imported into the Silhouette software to check the AI Power matte.A power matte node was applied to the footage, and then basic roto prep was done to separate

the foreground from the background and create an alpha matte. When it comes to output, rotoscoping is a laborious process that must be carried out frame by frame. However, with thehelp of AI autonoums tools, this work is becoming somewhat easier, though it will still requiremanual adjustments to achieve a perfect result. In a similar vein, AI copycat automation nodesare also present in nuclear software.

Deepfakes: A Reddit user invented the media modification technique known as"deepfakes" in 2017 by replacing the faces of pornographic performers with actresses using Google's open-source deeplearning library. Using AI networks, this technology can replace non-participating individuals in captured images or videos. As Paul Walker from Fast & Furious 7 shows, artificial intelligence (AI) machine learning is frequently used in movies fordeepfakes, which replace character faces more affordably than more conventional techniques like computer-generated imagery.

Figure 3: AI Deepfake

Source – Image generates by Researcher from Akool

This video above was captured at 25 frames per second with 1920 x 1080 pixels as the resolution. This video was imported into the Akool online platform to verify AI Deepfake, andwith just one click, the Deepfake video was created. Despite the fact that all of these platformsmake the claim to be open source, using these apps requires payment and credit. Severalplatforms, including faceswap, faceswapper.ai, and DeepFaceLab 2.0, are mentioned here.

Deepfake's futuristic approach suggests that Double Role can benefit from this technique. Motion Control, Rotoscoping, Match Moving, Compositing, and Colour Grading are employedin Double Role technique, which is a time-consuming process. Many complicated processes can be made simpler if deepfake technique is developed more effectively, such as match moving.

Image Reconstruction and Enhancement: A software or application known as an AI photo restorer uses artificial intelligence algorithms to improve and repair old or damaged photos. Typically, these tools use a variety of techniques, including batch processing, automatic restoration, colorization, noise reduction, scratch and dust removal, and detail enhancement. The Content-Aware Fill function in Adobe Photoshop, Remini, and other internet services arewell-known AI photo restoration tools.

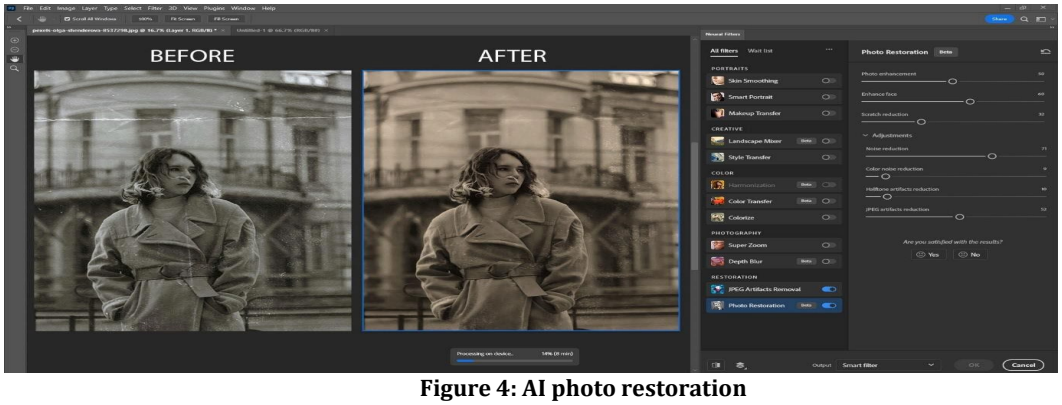


Figure 4: AI photo restoration

Source – Image generates by Researcher from Photoshop

Figure 5: AI photo restoration

Source – Image generates by Researcher from Photoshop

the above images generated In Adobe Photoshop version 2023, "Neural Filters" is a feature that leverages artificial intelligence (AI) and machine learning technology to perform various image editing tasks. Neural Filters can be used to apply effects, enhancements, and adjustmentsto images with more precision and control than traditional editing tools.

Realistic CGI Characters: The need for 3D models has increased due to the boom in 3D interactive content, particularly in the gaming, movie, and XR sectors. While inexperienced creators have difficulty using sophisticated tools like Blender or Maya, expert creators must endure long production times. A solution is necessary to close this gap, which is exacerbated by complexity and cost barriers. Solutions for tasks like 3D modelling, facial expression and animation, rigging and animation, texturing and shading, and facial animation are being offeredby AI. Realistic CGI character creation can be aided by a number of AI-driven tools and methods, which include:

- Meshy is a quick 3D generative AI that enables content producers to quickly turn text and pictures into engrossing 3D models. Meshy-1 offers three user- friendly modes.

Text to 3D	Image to 3D	Text to Texture

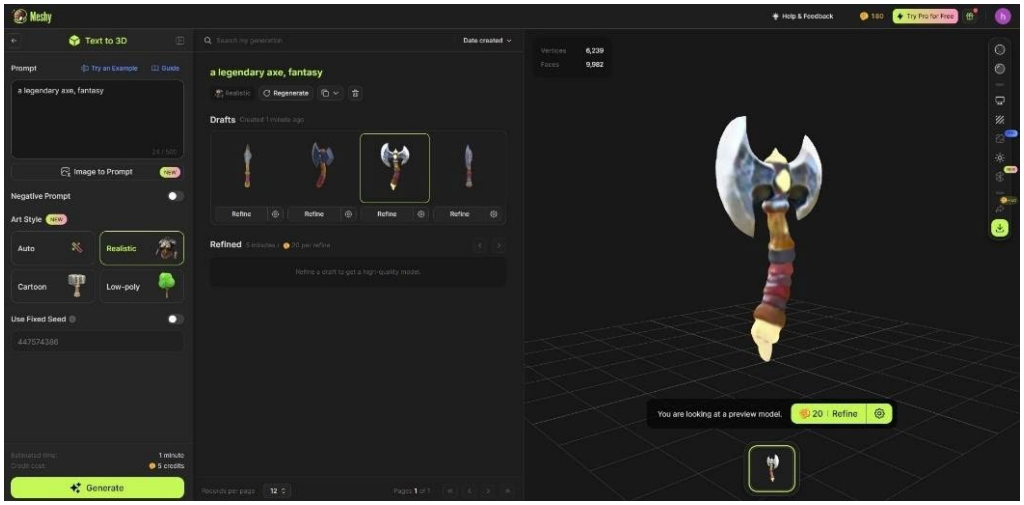


Figure 6: AI photo restoration

Source: Image generates by Researcher from Meshy

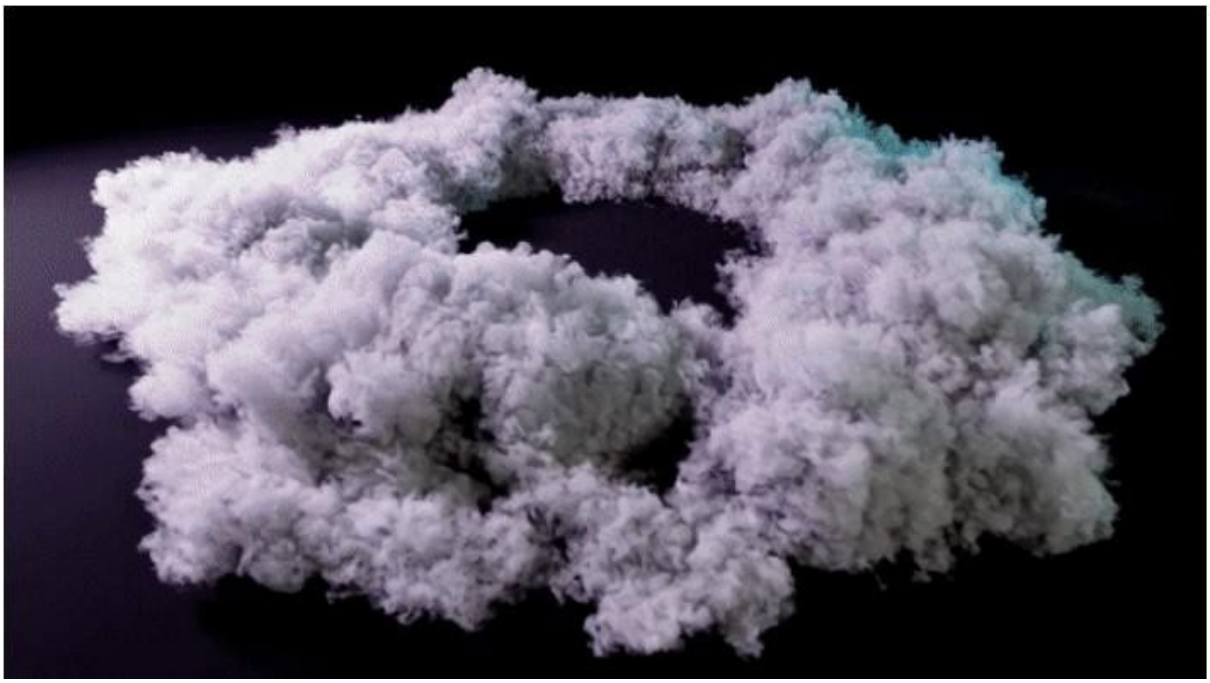
the above images generated in Meshy 3D AI Generator from Text to 3D by simply type “alegendary axe, fantasy”

- Generative Adversarial Networks (GANs): Using training data, GANs can produce realistic textures, facial features, and whole character designs.
- Deep Learning for Animation: Naturalistic animations and movements for computer-generated imagery (CGI)

characters can be produced with the help ofdeep learning models trained on motion capture data.

Real-Time VFX: Real-time visual effects are created in a variety of interactive mediathrough the use of several AI-driven tools and technologies. AI-powered physics simulation engines, like NVIDIA's PhysX, simulate realistic physics interactions in real-time by predicting the behaviour of dynamic objects through machine learning algorithms. With the help of these engines, game, VR, and AR developers can create immersive environments with realistic object interactions, fluid dynamics, and particleeffects.

Figure 7: AI-powered physics simulation engines



Source: https://developer.nvidia.com/physx-sdk

These illustrations demonstrate how artificial intelligence (AI) has the ability tomodify or eliminate labor-intensive and uninspired visual effects production processes,leaving behind a more dependable toolkit with the potential to significantly reduce labour and time requirements.

6. IMPACT OF ARTIFICIAL INTELLIGENCE ON VISUAL EFFECTS INDUSTRY

AI tools for creating 2D images have advanced significantly over the past year, utilising platforms like Dall-e, Midjourney, and Stable Diffusion. In a matter of seconds, these text-to-image AI tools convert text prompts into intricate imagery. Production companies are lookingahead to 2024 and see that the integration of visual effects (VFX) and artificial intelligence (AI) will play a significant role in the ongoing transformation of the film industry. We can anticipate that AI will play an even bigger part in visual effects as the field develops. Even though AI has already been used in some amazing ways, the journey is far from over. With artificial intelligence (AI) poised to transform the visual effects sector and produce morevisually spectacular and immersive film experiences, the future is full of exciting possibilities. But rather than taking the place of artists in VFX, AI's role is to provide them with more advanced tools.

In addition, AI will soon cause rendering to become faster and more effective. Technology is becoming more and more integrated into the film industry, and we have to recognise how much computing power it requires.

7. FINDINGS

1. Enhanced Efficiency: Artificial intelligence (AI) can help visual effects (VFX) companies optimise their workflows, cut down on the time needed to finish tasks, and ultimately boost efficiency. VFX artists' workloads can be lowered and time saved by using AI-powered software to automate processes rotoscoping.
2. Better Quality: AI technology can also make VFX better. Artificial intelligence (AI) can analyse and comprehend complex visual data using machine learning algorithms, then modify the image or video as necessary. VFX artists may

use this to produce effectsthat are more realistic and eye-catching.

3. Cost Reduction: VFX companies can experience long-term cost savings by implementing AI technology. VFX artists can concentrate on more intricate and creative work, leading to higher-quality output, by automating some tasks. AI-powered softwarecan also lessen the need for manual labour, which saves overhead for visual effects companies.
4. Job Losses: The possibility of job losses as AI takes over the VFX industry is one of the main worries. Artificial intelligence (AI) has the potential to completely replace some jobs while also making VFX artists' jobs easier. Software that can automate motion tracking or rotoscoping, for instance, can replace the need for certain VFX tasks.
5. Over-reliance on Technology: The possibility of an excessive reliance on technology isanother issue with AI taking over the visual effects sector. Artificial intelligence (AI) isa valuable tool, but it shouldn't completely replace human creativity. An over-relianceon AI may hinder innovation and hinder the creative process.
6. Lack of Human Touch: It can be challenging for AI to imitate the distinct viewpoint and artistic touch that VFX artists bring to their work. Artificial intelligence (AI) lacksthe human intuition and touch, even though it can assist in automating some processes.

8. RECOMMENDATIONS

VFX companies can fully realise the potential of this exciting technology while preserving thehuman touch that makes VFX so distinctive by striking a balance between AI and human creativity. How should VFX artists adapt in light of AI's quick development to preserve their value? The following viewpoints offer guidance on effectively adjusting to incorporate new technologies: AI as a tool to help creatives The fundamental human abilities of creativity, problem-solving, and teamwork must change such that AI is seen as a potent toolkit rather thana replacement.

Grow with the technology: Rather than being replaced by it, artists should actively learnnew AI-enabled workflows to optimise its benefits. Concentrate on higher-value tasks: By using AI to automate tasks of lesser complexity, more time can be allotted to high-level creativechallenges that can only be solved by humans. Use hybrid thinking: Innovation will come fromcombining the complementary advantages of data-driven AI with emotion-driven human intelligence. VFX artists can keep creating amazing visual experiences that resonate with people by actively defining their place in an AI-assisted future as opposed to fighting against change.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Adee, S. (2020). What are deepfakes and how are they created? IEEE Spectrum, 29.

Chu, M., Xie, Y., Mayer, J., Leal-Taixé, L., & Thuerey, N. (2020). Learning temporal coherence via self-supervision for GAN-based video generation. ACM Transactions on Graphics (TOG), 39(4), 75-1.

Curtin, M., & Vanderhoef, J. (2015). A Vanishing Piece of the Pi: The Globalization of Visual Effects Labor. Television & New Media, 16(3), 219-239.

Kim, P. (2017). MATLAB Deep Learning: With Machine Learning, Neural Networks and Artificial Intelligence: Apress.

Kimmel, R., Klette, R., & Sugimoto, A. (2011). Computer Vision - ACCV 2010 (Vol. 6492).

Lu, Y. (2019). Artificial intelligence: a survey on evolution, models, applications and future trends. Journal of Management Analytics, 6(1), 1-29.

M. Mori, K. F. MacDorman and N. Kageki. (2012, June) The Uncanny Valley [From the Field]. IEEE Robotics & Automation Magazine, 19(2), 98-100

Park, S., Ryu, H., Lee, S., Lee, S., & Lee, J. (2019). Learning predict-and-simulate policies from unorganized human motion data. ACM Transactions on Graphics (TOG), 38(6), 1-11.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 60–65

GEN Z AND SOFT MASCULINITY: EXPLORING PERCEPTIONS AND CONSUMER BEHAVIOR IN FASHION & BEAUTY INDUSTRY

Aditya Mehta[1]

[1] Research Scholar, GLS university

ABSTRACT

In recent years, there has been a notable shift in societal perceptions of masculinity. It is characterised by a departure from traditional masculine norms towards a more inclusive, emotionally engaged, and empathetic approach, also known as Soft Masculinity. Generation Z, born between 1996 - 2010, are the most diverse generation, inclusive, digital natives and known for their strong sense of individuality, social consciousness, and preference for authenticity. Reports have estimated their global spending power of around $4.5 trillion by 2025, making them one of the most significant target group. In contrast, their previous generation, Millennials, commanded over $1 trillion in spending power in 2010. In this zeitgeist, there are market opportunities for fashion and beauty brands to capitalise on growing demand for gender-inclusive and emotionally resonant products. Through a comprehensive, mixed-methods research, this study observed a notable openness towards embracing soft masculinity and beauty-related products traditionally associated with femininity. However, the influence of peer pressure or gender stereotypes appeared to be less pronounced in beauty and skincare domain compared to fashion consumption.

Keywords: Generation Z, Soft Masculinity, Fashion Trends, Consumer Behaviour, Beauty Trends

Corresponding Author

Aditya Mehta,
adityam93224@gmail.com

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1287

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

1. INTRODUCTION

The fashion and beauty industry is a rapidly evolving sector, driven by changing consumer preferences and societal norms. The industry is continually adapting to meet the demands of diverse consumer segments. At the same time, Generation Z also known as Gen Z, which comprises people born between 1996 and 2010 (Patel & Mehta, 2021), has emerged as a strong force within the consumer landscape. Their spending power is expected to be worth over $4.5 trillion by 2025 (Shejale, 2023) . This group is known for their digital fluency, diverse perspectives, and strong sense of individuality. As such, they wield considerable influence over market trends and brand perceptions.

In contemporary society, traditional masculine norms and stereotypes have been deeply entrenched, emphasizing characteristics such as strength, dominance, and emotional stoicism. This historical narrative is evident in depictions of masculinity found in literature, art, and media. Masculinity theories, such as Connell's concept of hegemonic masculinity, offer frameworks for comprehending the construction and perpetuation of dominant forms of masculinity within societal

structures while acknowledging the diversity and fluidity of masculine identities. However, societal transformations, including feminist movements and evolving gender roles, have catalyzed the emergence of alternative concepts such as Soft Masculinity. This paradigm shifts challenges traditional notions of masculinity by embracing qualities like empathy, vulnerability, and emotional expression.

Soft Masculinity signifies a departure from rigid, traditional masculine norms, embodying a more inclusive, emotionally engaged, and empathetic approach to gender expression. It finds its roots in various cultural movements, including the men's liberation movement of the 1970s and contemporary dialogues surrounding toxic masculinity and gender equality. The men are in continual transformation, that takes time and effort. (Lorello, 2019)

It advocates for a redefinition of masculinity as multifaceted and fluid, empowering men to express a broader spectrum of emotions and behaviors without fear of societal judgment or condemnation. we can observe that the a softboy, someone following soft masculine traits, has been divided into numerous sub-genres, each with somewhat different characteristics and behaviours. (David, 2019)

Sun Jung has introduced that the concept of soft masculinity popularized by the Korean Wave (AZIZAH & DWIYANTI, 2021). K-pop idols perform characteristics where masculinity is purposefully "watered down" for a more relatable, egalitarian image.by having softer appearances, child-like behavior, and more emotionally expressive personalities (Sihan , 2023). In the United States, softboy culture has become highly influential and pervasive, exerting a significant impact on mainstream societal norms, values, and behaviors. America's pop culture, much like its politics, is undergoing a hard split, with the music charts largely ruled by R&B acts and softboy-leaning pop artists (Robertson, 2021). This trend is emerging around the world and one can be influenced by this even if geographically not close to it. Looking beyond the internet into mainstream culture, attitudes to gender are changing and that's impacting the way men see themselves. (WGSN, 2021)

Generation Z represents the most diverse generation to date, characterized by a strong emphasis on individuality, social consciousness, and inclusivity. Raised in the digital age, members of Generation Z exhibit fluency with technology, social media proficiency, and a preference for authentic, socially responsible brands. They prioritize diversity, inclusivity, and sustainability in their consumer choices, often gravitating towards brands that resonate with their values and beliefs.

The explorative journey towards self-discovery and identity formation initially unfolds within the realm of aesthetics, where young individuals, both men and women, embark on a multifaceted exploration of their identities by transcending conventional boundaries. Through this process, they envision themselves embodying diverse gender and cultural identities concurrently. These endeavors extend beyond mere aesthetic experimentation, serving as catalysts for initiating transformative shifts within cultural hegemony. (Iida, 2006) Soft masculinity embraces qualities such as emotional intelligence, empathy, and inclusivity. As a result, it resonates deeply with Gen Z's values of authenticity and social consciousness.

Existing literature suggests that Soft Masculinity can exert influence on consumer behavior by challenging traditional gender norms and broadening the scope of products and experiences deemed acceptable for men. Studies indicate that individuals adhering to more traditional masculine norms may exhibit lower propensity to engage in certain consumption behaviors, such as purchasing beauty or self-care products.

Globally, this trend has already penetrated the market and used for commercialisation. Cosmetic and skincare giants, like Estee Lauder and L'Oréal are responding to the growing demand with a litany of grooming products targeted towards men (Lim, 2018). The Korean beauty and skincare market customized for men was estimated to gain 1.19 trillion KR₩ in 2018. A recent survey in Korea suggests Gen Z is more open to men openly wearing makeup (Lee, 2018). British men now spend more on grooming products and treatments each month than women (Barclays Consumer Spend Index, 2017)

Despite burgeoning interest in Soft Masculinity as a cultural phenomenon, a notable gap exists in research exploring its impact on Generation Z consumer behavior within the fashion and beauty industries in India. This paper aims to explore the intersection of soft masculinity, fashion, and beauty within the context of Indian Gen Z consumers.

2. METHOD

This study was conducted using mix method research via surveying respondents who identify as Gen Z male. The questionnaire was prepared to test the qualitative and quantitative aspects of this research, and was circulated online using convenience sampling technique. Measurable data was gathered through questions on personal income, spending on clothing, accessories, and grooming products to analyse the quantified patterns. Qualitative insights were also gathered on their perception of masculinity, awareness, perceived reactions and individual attitudes. Since, the attention

span of the target cohort group is short, the questions were accompanied with fun, interesting GIFs and few trap questions were asked to check if the respondents read the questions or not. In total, 110 Gen Z male filled the survey, out of which Five were identified as random responders and their responses were nullified.

3. RESULTS

DEMOGRAPHIC DATA

From 105 respondents, 40%are aged between 18-21years, 37.1% aged between 26-28 years and 20.9% were between 22-25 years. 77.1% respondents were from Tier1 cities in contrast to 8.6% from Tier 3 cities in India. For their current occupation, 45.7% are working professionals, followed by 42.9% of students pursuing bachelors and 2.9% were entrepreneurs. Since, Gen Z is digital native, and born in the age of internet (Fromm & Read, 2018), their Social Media usage was on the higher side. 28.6% respondents use social media platforms for more than four hours a day in striking contrast to just 8.6% respondents using social media less than an hour.

PERCEPTIONS ON MASCULINITY AND GENDER ROLES:

As we see the shift in overall concept of gender and its assigned roles and characteristics, this research also aimed to understand the perception of Gen Z on this theme. For the study, the list of characteristics are taken from literary works of Michael Kimmel and Judith Butler but also reflect common societal beliefs and expectations that have been culturally ingrained over time. On asking the traditional characteristics that define masculinity, Independence and self- resilience was highest with 68.6% responses, followed by protectiveness, strength and toughness, assertiveness and leadership and others as shown in figure 1 below.

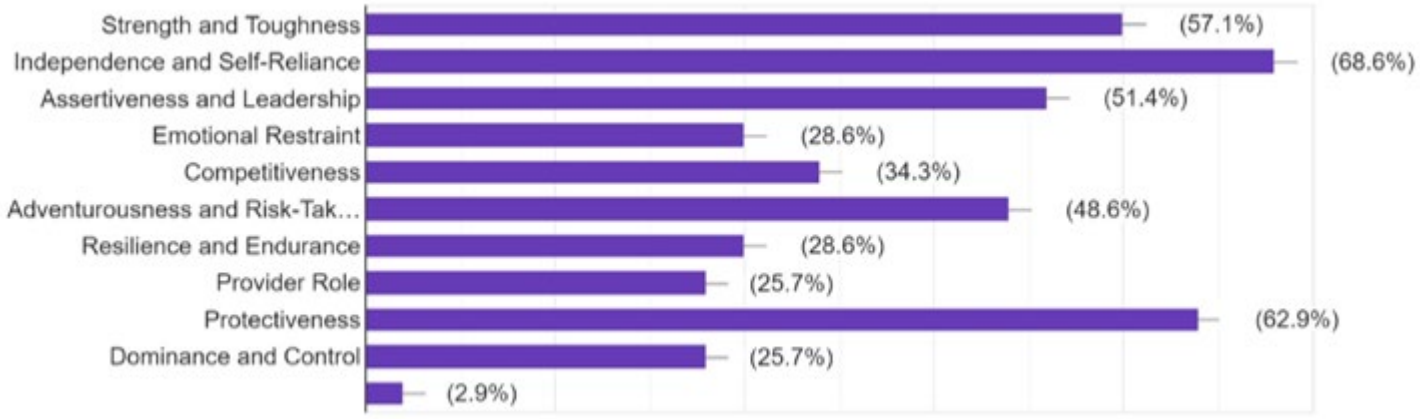


Figure 1 Traditional Masculine traits as per the respondents

25.7% respondents strongly felt that they don't match up to all the traditional traits, and more than 60% of them have felt pressure to conform to these traditional masculine norms where as 40% feel that these norms are outdated and not relevant in today's time with 37.1% respondents feeling that these norms are toxic. 67.7% of respondents who feel or sometimes feel traditional masculine traits are toxic rate Soft Masculinity positively

In contrast, when asked for their understanding of traditional feminine characteristics, traits such as Nurturing and caregiving, sensitivity and emotional expressiveness, patience etc. were selected the most as shown in the figure 2 below.

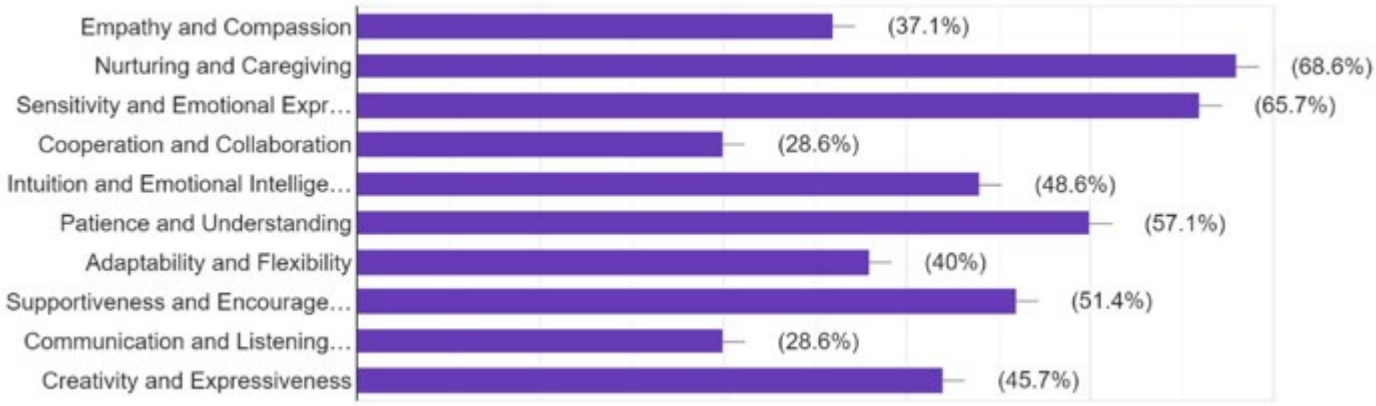


Figure 2 Traditional Feminine traits as per respondents

PERCEPTION ON SOFT MASCULINITY

From the total respondents 57.1% have not heard the term "soft masculinity" before the survey, out of which 48% considered it a positive and welcoming change, with 80% of total respondents felt that it is a positive trend for men's mental health. Furthermore, 84% of older Gen Z showed more acceptance of the soft masculinity and only 31% of Gen Z between age 22-25 thought soft masculinity as a welcoming change.

At the same time, 10% of the respondents felt that the men in their surroundings will reject this concept. 17.1% of respondents also felt that using term "Soft Masculinity" actually reinforces the gender stereotypes. More than 83% felt that they'll be teased or stereotyped for following soft masculinity traits by the men in their immediate circle.

SOFT MASCULINITY AND FASHION CONSUMPTION

On an average, 80% of the respondents have spent more than ₹3000/- on clothing in last six months, and 88% are comfortable in expressing themselves through clothing. This cohort group is highly active on social media as mentioned earlier, social media platforms were ranked first for their fashion inspiration, followed by popular media, friends and at the end family members as shown in figure 3 below. 37.1% of the respondents have been following social media influencers who practice or promote soft masculine fashion.

When it comes to shopping clothes which are traditionally associated with feminine look, 40% have already purchased something from the opposite gender section and 37.1% are willing to shop if it is not overpowering. But given a choice, only 40% will spend money on clothing ad accessories associated with soft masculine fashion and 37.1% would only spend less that ₹1000/ on soft masculine fashion, out of which, majority were from the age group of 18-21. Gen Z aged 26-28 showed willingness to spend more money on soft masculine fashion compare to other age groups, clearly showing their purchase power and individualistic choices. It was noteworthy, that 37.2% felt that men in their immediate circle with criticize them for sporting a soft masculine fashion.

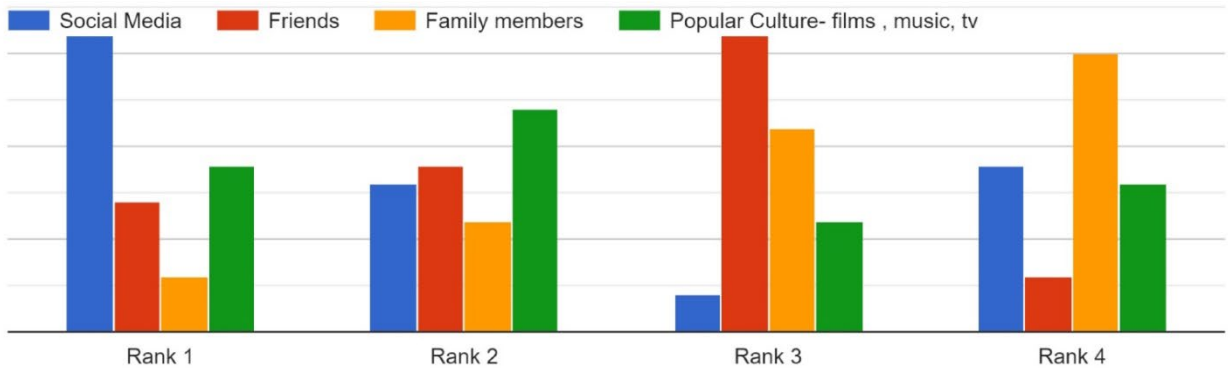


Figure 3 Source of fashion inspiration for Gen Z

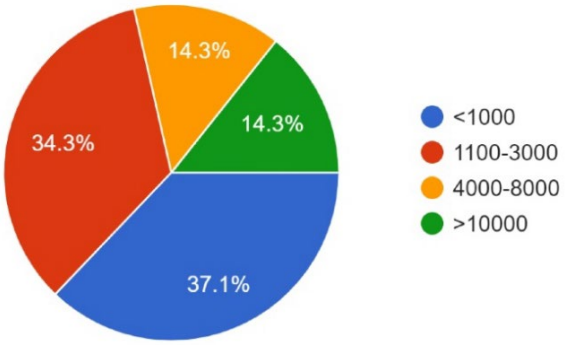


Figure 4 Willingness to spend money of soft masculine fashion

SOFT MASCULINITY AND GROOMING/ BEAUTY CONSUMPTION

When it comes to the grooming and beauty related consumption in Gen Z men, the results were quite positive. For 82.9% respondents their grooming was important. In last six months, 14.3% spent more than ₹10,000/- on their grooming and beauty products, while only 20% spent less than ₹1,000/-. These products were mainly related to hair and facial hair, fragrance and skincare followed by intimate care and nail care at the end.

It was also observed that the awareness of skincare/ beauty products has increased in this cohort group, as 62.9% respondents are aware of various skincare products available in the market and 65.7% have also used them in some or other way. More than 60% respondents are willing to spend money on these skincare/beauty products with 5.7% respondents willing to spend more than ₹10,000/- as shown in figure 5 below.

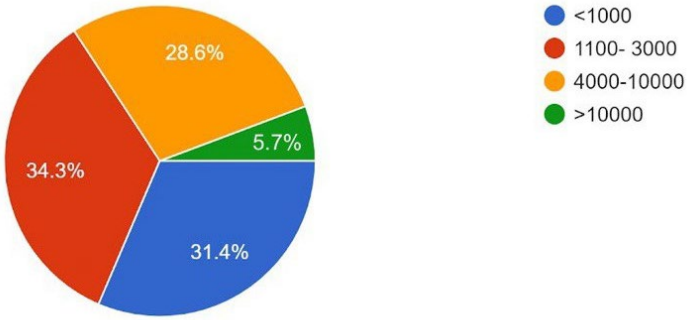


Figure 5 Willingness to spend money on beauty and grooming products

In contrast to the soft masculine fashion consumption, 68.6% respondents had men in their immediate circle using these products. Also, the peer pressure or gender stereotypes were not influenced while using these products. When it comes to using these products which are traditionally associated with women, 37.1% of them felt it neutral and 48% felt it irrelevant, meaning they would all try the products. Only 14% respondents felt that the men in their circle would not approve of them using skincare/ beauty products. From all the respondents willing spend more than ₹4000/- on skincare and grooming products, 50% respondents were of age 26-28, again showing their financial independency.

Although, 54.2% respondents would highly purchase beauty/ skincare related products, if they were promoted, featured and referred by men. This also reflects on the way marketers are changing their communication. The cosmetic industry in South Korea was dominated by women that shows preference towards women ambassadors, but there has been a recent trend in the industry to feature male K-Pop idols as the brand ambassador.

Younger Gen Z in age 18-21 are heavily influenced by social media and popular culture in their fashion and grooming choices and are more experimental and open to blending traditional and modern traits of masculinity. Whereas, older

Gen Z in age 26-28 have shown a more varied spending pattern, with 30% willing to spend more than ₹10,000,suggesting a higher disposable income or greater interest in soft masculine/gender-inclusive styles within this group.

4. CONCLUSION

The concept of "soft masculinity" emerged as a relatively new term for many respondents, with varying perceptions of its significance. While a significant portion viewed it positively, associating it with improved mental health for men, there was also apprehension regarding acceptance from peers and the reinforcement of gender stereotypes. This reflects the complexity of navigating evolving gender norms and the challenges associated with changing traditional perceptions of masculinity.

Regarding fashion consumption, social media played a pivotal role as the primary source of inspiration, particularly for soft masculine fashion. Despite a willingness to explore clothing traditionally associated with the opposite gender, there was hesitance in fully embracing soft masculine fashion, with concerns about peer criticism and societal norms.

In contrast, grooming and beauty consumption among Gen Z men showed a more positive trend, with a majority considering grooming important and expressing willingness to spend on skincare and beauty products. The increased awareness and usage of skincare products signify a shifting attitude towards self-care and personal grooming among men. Importantly, the influence of peer pressure or gender stereotypes appeared to be less pronounced in this domain compared to fashion consumption. The study highlights the challenges faced by Gen Z individuals in navigating evolving gender norms and consumption practices while also presenting opportunities for businesses and marketers to cater to changing preferences and attitudes.

The data indicated that Gen Z males are increasingly embracing soft masculinity and gender-inclusive fashion due to a combination of exposure to new trends, the influence of social media and celebrities, changing attitudes towards traditional masculinity, and a growing focus on personal expression and self-care.

As a future direction, this study can be taken further through longitudinal study to assess the impact of soft masculinity trend on Gen Z also a cross-cultural study can take place to understand the impact of socio-cultural factors on gender perceptions and consumption patterns.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

None

REFERENCE

Iida, Y. (2006). Beyond the ‘feminization of masculinity’: transforming patriarchy with the ‘feminine’ in contemporary Japanese youth culture. Inter-Asia Cultural Studies.

Lorello, J. A. (2019). DISRUPTING MASCULINITY AND PATRIARCHY: STORIES OF MEN. Dissertation, Greensboro.

AZIZAH, N., & DWIYANTI, A. (2021). South Korea in Reconstructing Masculinity as Brand Image of the State’s Economic Diplomacy. SOCIOLOGÍA Y TECNOCIENCIA.

(2017). Barclays Consumer Spend Index. Barclays Consumer Spend Index.

David, I. (2019, August 22). Vice.com. Retrieved February 2024

Fromm, J., & Read, A. (2018). Marketing to Gen Z: the rules for reaching this vast and very different generation of influencers. New York: Amacom.

Greene, J., Bone, I. (2007). Understanding neurology: A problem-oriented approach. CRC Press.

Lee, S. (2018, November 12). The Jakarta Post. Retrieved February 2024

Lim, L. (2018, November). Augustman.com. Retrieved February 2024

Patel, A., & Mehta, A. (2021). Gen Z reshaping the Streetwear Sneaker Market. GLS Kalp.

Robertson, D. (2021, October). Politico.com. Retrieved February 2024

Shejale, P. (2023, July 18). https://timesofindia.indiatimes.com/. Retrieved February 2024

Sihan, L. (2023). The Research on the Portrayal of Soft Masculinity by K-pop. The International Conference on Interdisciplinary Humanities and Communication Studies.

WGSN. (2021, October). How a new generation is challenging masculinities and redefining identities. WGSN.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 80–94

INVESTIGATING THE APPLICATION OF BIOPHILIC DESIGN PRINCIPLES IN THE TRADITIONAL POL HOUSES OF AHMEDABAD WITH A CASE STUDY ON MANGALDAS NI HAVELI

Chaitali Sheth[1], Dr. Suman Pandey[2], Dr Anil Sinha[3]

[1, 2, 3]Gujarat Law Society Institute of Design, Ahmedabad, Gujarat, India

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1304

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

" This paper examines the application of biophilic design principles within the traditional "Pol" houses of Ahmedabad, with a focused case study on Mangaldas ni Haveli. Biophilia, a term popularized by Edward O. Wilson in 1984, suggests that humans have an inherent desire to connect with nature, a concept now essential in sustainable design. While biophilic design often incorporates elements like plants, water, natural light, and ventilation to create a stronger human-nature connection, traditional architecture in India, particularly in Pol houses, naturally integrates similar principles. Ahmedabad's designation as a UNESCO World Heritage City in 2017 emphasizes its rich architectural and cultural heritage, with Pol houses serving as enduring symbols of community, sustainability, and environmental adaptation.

Mangaldas ni Haveli, a significant example of this architectural legacy, was evaluated for its biophilic elements using the 15 biophilic design patterns by Stephen Kellert and Elizabeth Calabrese. The study identifies 12 patterns, including natural materials, indirect experiences of nature, and spatial configurations that evoke a connection to the environment. Despite being situated in a dense urban context, Mangaldas ni Haveli effectively promotes well-being and offers a sustainable model for heritage conservation. This research highlights how integrating biophilic design into heritage conservation can preserve cultural and architectural significance while making these spaces relevant for modern needs. The findings underscore the potential for traditional architecture to inspire sustainable urban design, reinforcing the enduring value of biophilic principles in enhancing quality of life in urban areas.".

Keywords: Edward Soja, Third Space Theory, William Shakespeare, As You Like It, Forest of Arden, spatial dynamics, identity transformation, social relations, liminality, hybridity

1. INTRODUCTION

"The relationship between humankind and nature can be one of respect and love rather than domination…The outcome...can be rich, satisfying, and lastingly successful, but only if both partners are modified by their association so as to become better adapted to each other...With our knowledge and sense of responsibility…we can create new environments that are ecologically sound, aesthetically satisfying, economically rewarding…This process of reciprocal adaptation occurs…through minor changes in the people and their environment, but a more conscious process of design can also take place." (René Dubos, The Wooing of the Earth) In his 1973 book The Anatomy of Human Destructiveness, psychotherapist Erich Fromm defined biophilia as a passionate love of life, including people, plants, ideas, and social groups. (Erich Fromm 19730). As a psychotherapist, Fromm offered a broad range and labelled biophilia a physiologically natural instinct. Since, numerous scientists and philosophers have used the word in many fields of study.

In Biophilia (1984), Edward O. Wilson used a biologist's technique to coin the "Biophilia hypothesis" and popularize the concept. Who instigated biophilia- explains that we have a subconscious desire to connect to nature and to embrace natural systems. This concept underpins Biophilic Design, and supports the hypothesis that humans have an inbuilt emotional affiliation to other living organisms, and "are intrinsically connected and linked to visible and non-visible geometric forms and patterns in nature" Wilson described biophilia as "the innate tendency to focus on life and lifelike processes" (Wilson Edward), arguing that a connection to nature is hereditary rather than physiological (as Fromm proposed). Given our evolutionary dependency on nature and other biotic forms for survival and personal fulfilment, the biophilia theory suggests that humans have an innate urge to connect to them (Terrapin Bright Green, 2014). Humans pay money to visit national parks and natural preserves, relax on beaches, trek mountains, and explore rainforests. Nature-based activities include skiing, mountain biking, and surfing. Buyers will pay 7% more for a property with good landscaping, 58% more for one that looks at water, and 127% more for one that is waterfront. This all studies convey humans love nature and their surroundings. Biophilia suggests humans are inextricably linked to nature owing to their survival needs. To link residents to nature, biophilic design includes flora, water, natural light, and ventilation into the built environment. Use direct or indirect nature experiences to do this. Direct nature experience involves touching natural features. However, visuals, natural materials, colors, patterns, and geometries may generate an indirect experience. The built environment refers to the artificial area that encompasses our cities, neighbourhoods, workplaces, and houses, where individuals reside, work, and engage in recreational activities on a regular basis. Several recent research studies have focused extensively on the impact of our constructed surroundings on our physical and mental health, overall happiness, and standard of living.

Residential spaces are an important part of the built environment and have a significant impact on the health and well-being of persons. They provide surroundings that promote physical health, emotional well-being, safety, social interaction, and access to necessary utilities. An optimally planned residential area considers several variables that enhance overall well-being, establishing places where inhabitants may flourish and experience gratifying lifestyles. In today's residential design, there is a growing trend towards constructing homes that not only value sustainability and energy efficiency, but also establish a strong connection with the natural surroundings. The current concept of Biophilic design in buildings strives to enhance the connection between humans and the natural world by including aspects of both direct and indirect nature, as well as particular space circumstances. Biophilia refers to the innate human tendency to connect with nature, which is crucial for the physical and mental health and well- being of individuals even in today's contemporary society. (Stephen R. Kellert, Elizabeth. F. Calabse, 2015)

2. CULTURAL SIGNIFICANCE OF HERITAGE "POLS"

Although Ahmedabad possesses a great deal of architectural riches, the designation of becoming a UNESCO site in 2017. The significance and intended use of the inscription. In contrast to ambiguous phrases such as 'smart city', the UNESCO designation is explicitly and unambiguously defined. The term 'historic city' is inaccurate as it does not include the full city, but rather specifically refers to a small section called the ancient walled city and a narrow buffer zone around it. Moreover, it utilizes a meticulously defined set of criteria. Furthermore, it is crucial for a (local) government to formally apply to UNESCO for the purpose of inscription. Hence, the crucial determinant in this procedure is the extent of regional cognizance about cultural legacy and the ongoing preservation endeavours. Ahmedabad has been making efforts to get the designation for almost fifteen years, during which it undertook many creative conservation projects that may have impacted UNESCO's decision to grant the historic inscription. (UNESCO World Heritage Convention, Inscription 2017).

There are two specific criteria. Ahmedabad fulfills the initial criterion by demonstrating a notable interchange of human values over a certain duration or within the cultural area of the world, namely in the domains of architecture, technology, monumental arts, urban planning, and landscape design. According to the second requirement, Ahmedabad is regarded as a prime example of a traditional human settlement, land-use, or sea-use that embodies a culture or cultures, as well as human interaction with the environment. This is especially important when the settlement has become susceptible to irreversible alterations. Both of these conditions recognize that architecture is not autonomous, but rather has a substantial correlation with human behavior and urban organization. From this standpoint, the importance of the city's ancient architecture, including the mosques, Bhadra Fort, and Teen Darwaza, resides not only in their individual significance, but rather in their interconnection and their interaction with the surrounding urban environment. A comparison may be drawn between this site and another UNESCO site situated in Gujarat, namely Champaner. Despite being selected for its remarkable architecture, this ancient capital of Gujarat, which was constructed shortly after Ahmedabad, lacks any surviving residential structures or urban infrastructure. In contrast to Champaner, which gained

fame mostly for its state of abandonment, Ahmedabad serves as a prime example of a thriving cultural heritage. Ahmedabad's residential architecture stands out from other cities for two other reasons, as mentioned above. Initially, as a result of the chaotic circumstances I previously indicated, all the dwellings were organized into enclosed communities referred to as pols. In addition, the architectural legacy of Ahmedabad mostly showcases wood as the main material, rather than stone. The majority of the current traditional wooden pole dwellings range in age from 200 to 70 years. (Matfhijs Van Oostrum, 2018)

The "Pols" in Ahmedabad, India, are a distinctive characteristic of the city's urban landscape and are very significant in the residential domain due to its cultural, historical, architectural, and social significance. Pols homes not only exemplify their role in promoting sustainable urban living and nurturing communal life, but also hold value as a representation of cultural history and identity. Ahmedabad was designated as a UNESCO World Heritage City in 2017, acknowledging its abundant historical heritage and cultural importance, particularly the Polls. This designation has not only raised awareness of Ahmedabad's distinctive architectural and urban legacy, but also stimulated a growth in the examination and fascination with its traditional Pol homes. These ancient residential clusters, which date back to the 15th century, have developed throughout time and are now an essential component of Ahmedabad's cultural legacy, providing insight into the city's historical significance. Pols symbolize Ahmedabad's cultural and historical legacy. They were founded during the reign of Sultan Ahmed Shah and thrived under the Mughal Empire. Every Pol serves as a time capsule, safeguarding the lifestyle, traditions, and customs of its residents.

Recreating the visual representation of the old city during its initial 150-year period is a difficult task. Nevertheless, it is conceivable that the current magnificent residences are the result of a steady advancement that occurred as the city became more prosperous. The little courtyard remains in constant shade, facilitating the dissipation of hot air from above and creating a cooling breeze that affects the haveli. The entire residence functioned as a water collection and storage system. The residents depended on an underground reservoir to catch and store the monsoon rains, which they used for their daily needs throughout the year. Unfortunately, these traditional water-harvesting systems have become outdated in the current period, despite recent efforts to resuscitate them. Although it is accurate that each municipality only possesses a finite quantity of meticulously preserved historic residences, it is imperative to save not just the architectural elements but also the entire assemblage of buildings. Preserving the public space structures and other spatial and social elements that make up the community, such as the gate, water well, chabootras, otlas, etc., is of utmost importance.

An examination of the Pol homes in Ahmedabad within the framework of biophilic design is crucial as it illustrates how traditional architecture integrates features that establish a connection between residents and the natural environment, improving their overall well-being, promoting sustainability, and facilitating environmental integration. Biophilic design is a method that aims to establish a stronger connection between people inside buildings and the natural world by using natural materials, light, plants, and other features and concepts inspired by nature. Although the official definition of biophilic design is very recent, many classic types of building, such as the Pol homes, naturally incorporate its principles.

3. OBJECTIVE Of The RESEARCH

This project aims to investigate and record the integration of the 15 patterns of biophilic design, as established by Stephen R. Kellert and Elizabeth Calabrese, into Mangaldas Haveli, a significant historical and architectural site situated in Ahmedabad, India. This investigation seeks to reveal the degree to which traditional Indian architecture, as demonstrated by this haveli, integrates components of biophilic design, therefore improving the relationship between humans and nature inside constructed spaces. More precisely, the objective of the research is to:

3.1. To examine Mangaldas Haveli's 15 biophilic design themes. This includes personal observations and indirect portrayals of nature and spatial organization of pole houses.

3.2. The goal is to show how biophilic design can be used to protect and rehabilitate old buildings, preserving its cultural and architectural importance while ensuring their current relevance and Haveli's biophilic design application to inspire similar concepts in modern building.

4. RESEARCH METHODOLOGY

The research is characterized by both descriptive and analytical aspects. The study was carried out on-site at Mangala ni Haveli, where the researcher comprehends its architectural characteristics, historical importance, present

circumstances, and utilization of space. The researcher recorded the tangible characteristics of the haveli and its environs, with a specific focus on any present biophilic design components. In order to evaluate the biophilic approach of Mangaldas ni Haveli, the researcher utilized 15 biophilic characteristics. The data analysis entailed utilizing the haveli's architectural floor plan and photographic documentation. The data gathering was dependent on the researcher's proficiency in architectural observation. This study data collection method is a non-participatory observation method. The researcher employed analytical descriptive approaches to ascertain and elucidate the biophilic capability of the haveli.

5. ANALYSIS AND DISCUSSION

5.1 SPATIAL ORGANIZATION OF MANGALDAS HAVELI

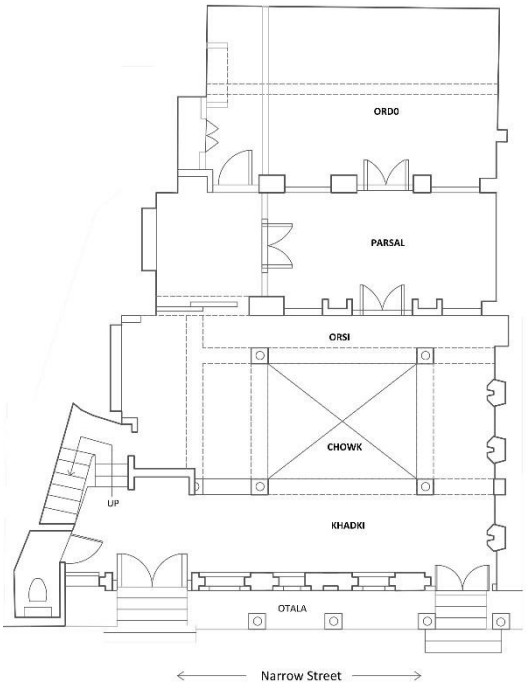


Fig. 1. Floor plan of Mangaldas Haveli

Fig. 2. Front view of Mangaldas Haveli

The 150 years old abandoned traditional Gujarati Nagar Brahmin family home, situated in a short road within one of the 'Poles' in the older part of Ahmedabad, has finely carved doors, windows, and balconies that serve as a reflection of the intimate nature of Gujarati culture. Numerous magnificent edifices have deteriorated and been dismantled due to financial limitations and a dearth of awareness and comprehension regarding the imperative to save our architectural heritage. Mangaldas Haveli serves as a notable illustration of preservation and adaptive reuse. Following the reconstruction, the haveli has transformed into an engaging and educational display that highlights the abundance and sophistication of the traditional ambiance, culture, and architecture of this area. Vaishali Shah, an interior designer and environmentalist, encountered Abhay Mangaldas, the energetic and lively offspring of a distinguished urban family. After conversing with him, she came across a charming narrative of transforming a dilapidated haveli into a stylish and historically significant hotel and restaurant.

Typically, pole homes consist of two-story structures, with the bottom level serving as the first floor. Pole homes are primarily categorized into six fundamental structures: Otla, khadki, chowk, orsi, Parsal, and Ordo.

5.2. OTALA (VERANDAH OUTSIDE)

Prior to entering the Pol house, there exists a designated area known as "otala," as seen in Figure 3. The elevated platform serves as a distinguishing feature between residential areas and the surrounding roadway. It is also utilized for religious purposes.

One side of the otala is designated for the provision of washing facilities and toilets. Over time, these activities that were visible from the street grew outdated and were moved indoors. However, within a limited number of households, individuals are utilizing the area for both laundry and sanitation purposes.

Fig. 3. View showing otala

Fig. 4. Steps defining entrance

5.3 BHAITAK AND KHADKI (DRAWING ROOM AND WINDOWS)

Once you enter the home, there is a drawing room known as "bhaitak," as seen in figure 5& 6 and guests are expected to sit inthis area. Khadki is the name of the windows. In the direction of the courtyard side, Bhaitak opens. as well as the windows of the house, which are another important aspect of a pole house. And this window open towards otla side. Wooden carved frame and window and metal grills jali is the enhance the beauty of house and also give light, ventilation and jali gives protection from unwanted entries of animal and humans.

Fig. 5. & Fig.6. Views showing Bhaitak and Khadki

5.4. CHOWK (COURTYARD)

in Indian society chowks are considered as a most auspicious space in home. Vastupurush Mandala, considered it as a location for Brahma, which signifies a space filled with empty space. The designated area is often known as Brahma Sthan. The primary characteristic of Pol residences is the courtyard. All activities are conducted inside the confines of the courtyard, as seen in Figure 8. The courtyard was designed to minimize direct sunlight throughout the summer and ensure ample illumination for all activities. The courtyard serves as a focal point and is strategically planned based on the traditional indian knowledge system. The courtyard's dimensions have been intentionally created to provide a connection with the higher levels. The top levels' windows face the courtyard. The courtyard effectively establishes a visual connection with the higher levels. A rainwater collecting tank is located beneath the courtyard, serving as a water reservoir. The aperture of the tank is occasionally conspicuously seen inside the courtyard or concealed within the parsal. The courtyard is designed with a modest incline to facilitate the gathering of rainwater. Previously, the courtyard was exposed to the sky. Nevertheless, in certain instances, it is shielded with fiber sheets or garments during the monsoon season to prevent the infiltration of moisture. The courtyard area has been levelled using parsal and bhaitak to optimize space use. And in a few houses put tulsi on a big pedestal which is a cultural biophilic representation.

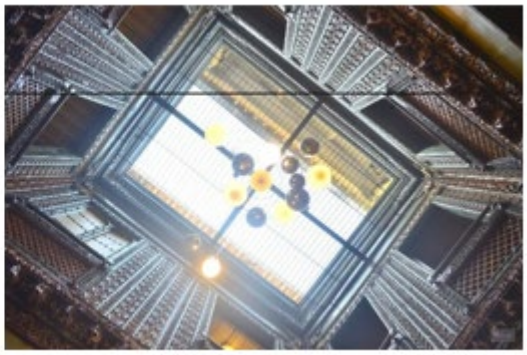



Fig. 7. & Fig. 8. Inside views of the Courtyard

5.5. ORSI

It is a part attached to the courtyard of the house at the back side. The spaces surrounding the courtyard all serve different purposes. Front side is attached with the entrance gate of the house and a khidki window. Central areas are used as a sitting area and the rear sides are attached to the other utility areas and private zones. The Figure number-8 explains it well.

5.6. PARSAL (FAMILY LOUNGE)

In most instances, the courtyard of Parsal (Family Lounge) exhibits a direct connection with the street. The courtyard is accompanied by a verandah, sometimes referred to as a "parsal," as seen in Figure 9. Previously, the kitchen was situated in a corner, but subsequently, one side of the parsal has been often utilized for both the kitchen and toilet. This parsal typically consists of two sides, with a rare occurrence of three sides. It serves as a valuable place for most activities. The swing in Pol homes is a crucial characteristic that is always positioned in parsal. The parsal often features a colonnade around the courtyard. The parsal area displays the swing and several other pieces of furniture. Following the parsal, there are one or two rooms referred to as "ordo" which serve as bedrooms or storage spaces.

The primary purpose of these rooms is to serve as bedrooms or storage areas inside the household. These rooms are dimly lit and lack sufficient ventilation.

5.7. ORDO

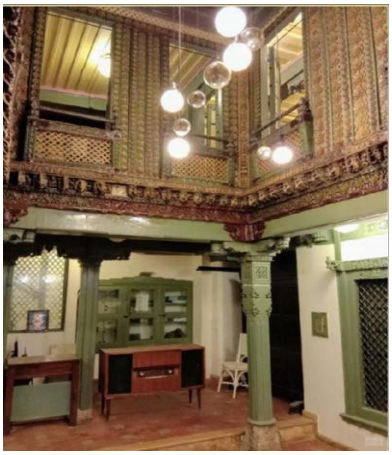


Fig. 9. View through courtyard showing private areas.

Following the parsal, there are one or two chambers referred to as "ordo". The primary purpose of these rooms is to serve as bedrooms or storage areas inside the household. These rooms are dimly lit and lack sufficient ventilation.

6. AN EXAMINATION AND DELIBERATION ON THE PRESENCE OF BIOPHILIC PATTERNS IN MANGALDAS HAVELI.

Typically, individuals have a strong affinity for nature and prefer having green areas in their vicinity. "14 Patterns of Biophilic Design" is a publication that provides a comprehensive set of tools for comprehending the many aspects of

Biophilic Design, together with the scientific principles underlying them. These patterns delineate the connections between nature, humans, and the constructed environment, and present possibilities for design interventions that might amplify the advantages of biophilia, and ultimately boost wellbeing. There are 14 Patterns of Biophilic Design which are following. 1. Visual Connection with Nature 2. Non- visual Connection to Nature 3. Non-Rhythmic Sensory Stimuli 4. Thermal & Airflow Variability 5. Presence of Water 6. Dynamic & Diffuse Light 7. Connection with Natural Systems 8. Biomorphic Forms & Patterns 9. Material Connection with Nature 10. Complexity & Order 11. Prospect 12. Refuge 13. Mystery 14. Risk and peril [5]

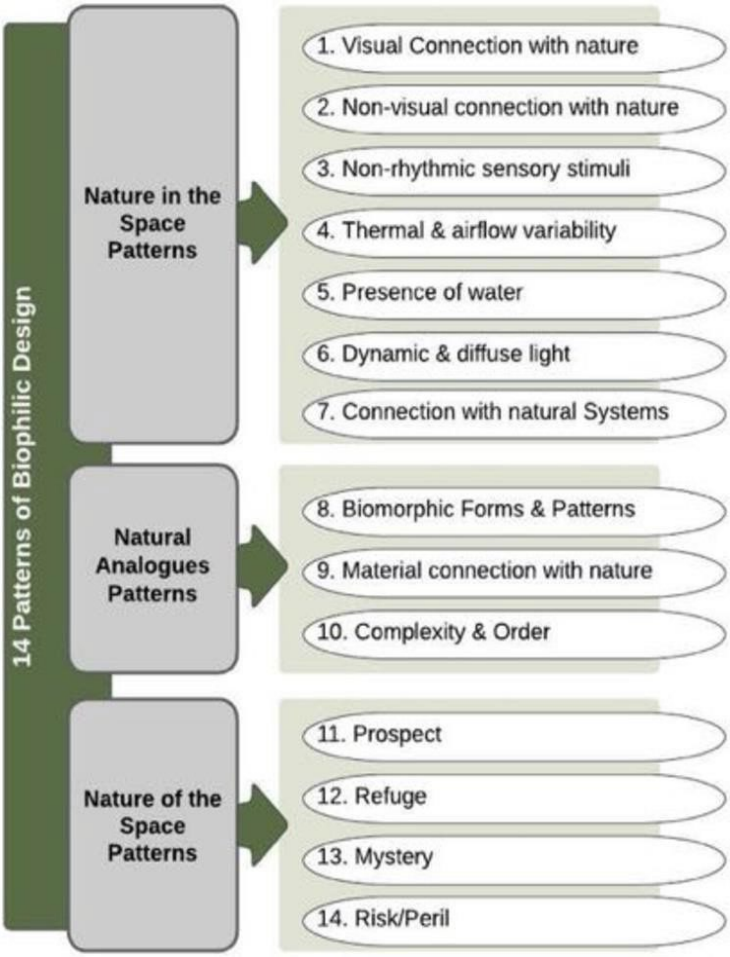


Fig. 10. 14 Patterns of Biophilic Design, 2014: Terrapin bright green

Source: Browning, William D., et al. "Patterns of Biophilic Design." ResearchGate, 2014, www.researchgate.net/figure/14-Patterns-of-biophilic-design-adapted-from- Browning-et-al-2014_fig3_368519102.

The 14 patterns of the biophilic design are categorized into three primary groups. 1. Nature in Space. 2. Nature analogues. 3. Nature of space. The biophilic patterns will be used to evaluate the nature of space, the architectural design, and the complete spatial arrangement of Mangal Das Haveli.

6. 1. NATURE IN SPACE.

6.1.1. Biophilic Pattern 1: Visual Connection With Nature

A visual connection to nature refers to the observation and understanding of natural components, processes, and living systems. The association with the natural environment has resulted in the most significant rejuvenating outcomes in comparison to other biophilic designs. Empirical data has shown that establishing a visual link with the natural world may diminish blood pressure and heart rate, enhance mental well-being and focus, and augment our general disposition and contentment.

DISCUSSION

Otala establishes a strong visual Connection with outdoor Environments. Despite the density of the Pol neighbourhoods, the orientation of houses and the presence of open spaces in the street lane allows views of the sky. Otla serves as an extension of the living space, providing an outdoor area where occupants can spend time during different times of the day, allowing them to experience the changing elements of nature, such as sunlight, breeze, and views of the surrounding landscape. As Otalo is slightly raised above the ground level it offers an elevated perspective of the surrounding and facilitates a stronger connection with the natural environment, enabling us to observe and appreciate elements such as wildlife and the sky.

Frequently observed are scenes of cows and dogs wandering through the streets and occasionally settling on the steps in front of homes, seeking refuge. The presence of squirrels and birds, such as sparrows and parrots, is a common sight in the holes and carved apertures of the facades of adjacent houses.

Residents can observe and experience seasonal changes more intimately from the vantage point of an otla.

Courtyard of the house, often open to the sky, allows residents to experience the changing elements of nature throughout the day. The strategic position of the courtyard allows for natural ventilation and daylighting to penetrate the interior spaces of the house. This not only helps in regulating the indoor climate but also brings the occupants closer to the natural elements, as they feel the breeze and observe the patterns of sunlight filtering through the courtyard.

Whether it's feeling the warmth of the sun, witnessing the play of light and shadow, or stargazing at night, the courtyard provides an unobstructed view of the sky, fostering a sense of connection with the celestial realm.

6.1.2. Biophilic Pattern 2: Non-Visual connection with nature

According to (Browning et al 2014). Non-visual Connections with Nature refer to the auditory, olfactory, gustatory, and tactile sensations that signify being in the presence of nature. Illustrations of this pattern encompass elements such as flowing water, fragrant flowers, tactile and organic materials, horticulture, natural airflow, animals, and auditory noises, whether artificial or natural, evoking a sense of nature. There is a correlation between non-visual interactions with nature and decreases in systolic blood pressure and cortisol levels, which are linked to stress. Furthermore, there have been enhancements in cognitive performance and psychological well-being.

DISCUSSION

Use of the natural materials like wood, stone, and brick in the construction of the house brings a tactile sensation of nature. Extensive use of wood can be seen in articulating the exterior front facade and courtyard. various elements of space making ranging from the stone steps and columns to wooden doors, windows, brackets, beams, roof structure, carved fillers in walls can be seen highlighted in the house. These materials can vary in temperature, texture, and even smell, offering a multisensory experience that connects occupants to the outdoors.

Extensive use of opening in the front facade in the form of doors, windows, jalis and protruding element mimicking jharokha allows natural ventilation. These openings facilitate cross ventilation, allowing the occupants of the house to feel natural breezes and also regulates changes in air temperature thereby enhancing the sensory connection to the natural world.

The sound of birds chirping is often experienced in the outdoors near the entry point of the house(otla) and sometimes in chawk (courtyard). As the birds reside nearby in the streets contributes to a serene atmosphere, reducing stress and promoting wellbeing. The architecture and design of the house encourage seamless indoor-outdoor living.

6.1.3. Biophilic Pattern 3: Non - rhythmic sensory Stimuli

Non-rhythmic Sensory stimuli refer to natural diversions that facilitate relaxation and provide respite from an activity. The primary health advantages are observed when engaging in activities with limited visual focus, such as computer usage. This is due to the subconscious attraction of attention and the facilitation of brief mental breaks from the job through the utilization of natural sensory inputs. These little interruptions (lasting up to 20 seconds) might enhance an individual's ability to concentrate on a task by inducing relaxation of the eye muscle, leading to the flattening of the

lenses. On the other hand, prolonged contraction of eye muscles due to prolonged attention (lasting more than 20 minutes) might lead to headaches and weariness.

Discussion

The intricately carved surfaces of the exterior facade and courtyard allows the play of light and shadow in the interior spaces. Use of Jali and wooden carving on the vertical surfaces not only create depth in the spaces but also create dynamism. The movement of the sun creates a dynamic interplay of light and shadow throughout the day in the courtyard. This natural spectacle provides an ever-changing visual experience that is never exactly the same, engaging occupants and visitors with the passage of time marked by natural light.

The layout of the courtyard and placement of the openings of both outdoor and indoor encourages the gentle yet unpredictable flow of breezes that weave and shift course. This varying sensory encounter fosters a direct and profound connection between individuals and the outdoor landscape.

The design of the courtyard, along with the strategic positioning of openings to both indoor and outdoor spaces, enables a gentle and playful movement of air flows that drift and change direction. This variable and dynamic sensory experience deepens the direct and meaningful relationship between people and the natural surroundings.

6.1.4. Biophilic Pattern 4: Thermal and airflow variability

Thermal and airflow the concept of variability pattern refers to the incremental fluctuations observed in airflow, temperature, relative humidity, and the utilization of diverse thermal materials, which emulate natural conditions. The thermal comfort of a home is a critical determinant of the productivity, tranquillity, and well-being of its residents. The concept of thermal comfort is inherently subjective, and it operates by introducing adjustable thermal conditions and airflow inside a given area. This enables individuals to regulate their thermal comfort by actively navigating and adjusting their surroundings. Research findings suggest that individuals prefer moderate degrees of sensory diversity, encompassing fluctuations in light, temperature, and sound. The absence of sensory diversity in environments can have a detrimental impact on productivity and lead to feelings of boredom. The objective is to enable the individuals to modify their degree of comfort by shifting their chairs (either towards the sun or shade) and by opening windows.

DISCUSSION

The incorporation of thermal and airflow variability is very well thought of while constructing the house. Thick walls, which are constructed from locally produced materials like sand and lime, offer good thermal mass, keeping interiors warm at night and cool during the day. This natural insulation is essential where night-time temperatures differ significantly from daytime temperatures.

The layout of the house was planned considering the orientation and the standard practices to optimize thermal comfort and natural ventilation. In order to keep the interior cooler, it is positioned to catch prevailing winds and protected from direct sunshine. By increasing the number of openings on the outer walls facing the shaded street, cool breezes are facilitated, allowing for cross ventilation in the house. Additionally, the strategic positioning of the courtyard as an open area inside encourages airflow throughout the building, contributing to the natural cooling of the living areas.

The house exemplifies a thoughtful integration of natural climate control methods that enhance living comfort while fostering a connection to the natural environment. This approach not only aligns with sustainable design principles but also leverages traditional architectural wisdom to create a harmonious living space.

Jali walls or lattice screens, typical in traditional Indian architecture, are incorporated into the house. These finely crafted screens serve to provide ventilation and diffuse light, thus

establishing a pleasant indoor climate. The airflow facilitated by these screens not only serves a functional purpose in cooling the space, but also contributes to the aesthetic appeal.

High ceilings and centrally placed courtyard acting as ventilation shafts contribute to enhancing airflow and lowering indoor temperatures. As warm air naturally ascends and exits through these shafts, it draws in cooler air from lower levels or shaded sections of the house, establishing a natural circulation of air.

6.1.5. Biophilic Pattern 5: Presence of water

Water's presence may enrich an area by establishing a visual, tactile, and aural bond with it. According to Biederman and Vessel and Alvarsson the existence of water has the capacity to reduce heart rate and blood pressure, enhance cognitive function, promote restfulness, and exert a favourable influence on emotions. Engaging in multi-sensory interactions with water enhances the perceived health advantages. The combination of auditory and maybe tactile sensations can effectively decrease stress levels by introducing a single modest water element, this multi-sensory experience can be further enhanced. A study conducted by Biederman and Vessel (2006) revealed that repeated exposure to the same body of water did not lead to a decline in interest levels. In fact, it was discovered that repeated exposure can enhance cognitive function by restoring memory and improving focus. Utilizing the auditory stimuli produced by water, the tactile experience it offers, and the scenic vistas across water are all possible avenues for establishing a Biophilic bond.

DISCUSSION

This Biophilic pattern is not present in the house.

6.1.6. Biophilic Pattern 6: Dynamic and diffuse light

According to Browning et al. (2014). Dynamic and diffuse light exert an impact on the levels of light and shadow, mirroring the fluctuating light conditions found in the natural environment. Daylight is frequently sought for in constructed surroundings, and the presence of dynamic and diffuse light can have a beneficial effect on human circadian cycles The objective of this pattern is to elicit ocular stimulation, hence eliciting a favourable psychological reaction and preserving circadian cycles. According to design considerations, it is recommended to achieve a balance between dynamic and diffuse light in order to enhance the interstitial spaces during outdoor transitions. Additionally, it is advisable to incorporate circadian lighting in areas that are utilized for the most of the day.

DISCUSSION

The architectural design incorporates a centrally positioned courtyard, serving as focal point for natural light. These open-to-sky courtyards, surrounded by living spaces, allow sunlight to filter in, casting dynamic patterns of light and shadow throughout the day. This interplay of

light adds visual intrigue and a sense of movement to the interior, strengthening the occupants' connection to the outdoor surroundings. To enhance the dynamic and diffuse light, strategically placed clerestory windows capture and distribute natural light throughout the interior spaces. These openings allow daylight to penetrate deeply into the building, reducing the need for artificial lighting and promoting sustainability. The shifting patterns of light and shadow cast by these features enrich the sensory experience, evolving with the passage of time. Use of traditional architectural elements like jali screens, intricately carved wooden panels, and lattice work are integrated into the design to diffuse incoming sunlight. This creates a soft, dappled effect, filling the interior with a warm and inviting glow. The play of light through these screens adds depth and texture to the environment. Reflective surfaces like whitewashed walls are utilized to bounce natural light deeper into the interior spaces. By maximizing sunlight reflection, these surfaces create a brighter and more expansive ambiance, blurring the boundaries between indoor and outdoor realms. This amplifies the sense of spaciousness and elevates the visual aesthetics of the living environment.

6.1.7. Biophilic Pattern 7: Connection with natural system

Engaging with Natural Systems fosters a robust bond between humans and the natural world. This link fosters an understanding of seasonal variations, temporal fluctuations, and a connection with natural phenomena. According to Browning et al. (2014), the predictability of the experience frequently contributes to a state of calm for the spectator. This pattern aims to enhance individuals' understanding of natural processes and encourage human stewardship of the environment and ecological systems. Integrating the pattern might be as simple as observing a deciduous tree or building using materials that undergo aging and transformation over time.

DISCUSSION

There is a profound link with natural systems, where architectural design and lifestyle practices are intricately connected to the surrounding environment. In Mangaldas Haveli, traditional rainwater harvesting techniques are integrated to efficiently manage water resources. Rainwater is collected from rooftops and directed into storage tanks or underground reservoirs for future use. This sustainable approach reduces dependence on external water sources and aids in replenishing groundwater levels, thereby contributing to the overall well- being of the local ecosystem.

The architectural design of Mangaldas Haveli is customized to suit the local climate, incorporating features such as thick walls, shaded courtyards, and natural ventilation systems to regulate indoor temperatures. By employing passive design strategies, the houses maintain a comfortable environment year-round while minimizing energy consumption and mitigating environmental impact.

6.2. NATURE ANALOGUES.

6.2.1. Biophilic Pattern 8: Biomorphic forms and patterns

The concept of biomorphic architecture and patterns involves the symbolic portrayal of nature via the utilization of patterns, textures, and materials that are naturally present. The aforementioned shapes frequently encompass abstract aspects that elicit naturally existing forms, like plants, shells, branches, and creatures. Humans exhibit a predilection for seeing biomorphic and organic structures, yet the scientific data supporting this inclination is not substantial. The human mind possesses an understanding that biological forms lack life, yet certain individuals perceive them as symbolic manifestations of living entities, therefore establishing a symbolic association with the natural world.

The objective of this biophilic pattern is to incorporate symbolic design elements that elicit a sense of connection between people and live organisms. It is desirable to incorporate these elements in order to create a visually appealing environment for the individual, which has the potential to improve cognitive function and reduce symptoms of stress. The Fibonacci sequence is a fundamental biomorphic pattern that is observed in various living organisms, characterized by a numerical arrangement that is recognized as wholly biological. It is a phenomenon observed in several flowers and plants, where the spacing of leaves prevents new vegetation from shading or obstructing the old vegetation's access to rain. The golden ratio, which is observed in several rotational organisms, is closely associated with the Fibonacci sequence and has a ratio of 1:1.618. Seashells and flowers exemplify the growth patterns that adhere to the golden ratio.

DISCUSSION

The exterior and interior walls of Mangaldas Haveli are adorned with intricate carvings depicting floral motifs and geometric patterns. These carvings often emulate the shapes and textures of plants, flowers, leaves, and animals, establishing an organic unity with nature. Biomorphic forms and patterns are also evident in the decorative details throughout the haveli, including doorways, windows, balconies, and ceilings. These features often showcase elaborate embellishments like twisted vines, floral garlands, and stylized animal figures, showcasing the region's rich cultural heritage and artistic traditions. The integration of biomorphic forms and patterns in Mangaldas Haveli reflects a deep admiration for the beauty and intricacy of the natural world. These elements not only enhance the haveli's visual allure but also foster a sense of harmony and connection with the environment, enriching the cultural legacy and daily life of its residents.

6.2.2. Biophilic Pattern 9: Material connection with nature

The concept of a Material Connection with Nature encompasses the use of natural materials, grains, textures, and components in design that resonate with the local environment and contribute to the establishment of a distinct feeling of place. The objective of this design is to elicit favourable cognitive reactions by integrating various natural materials. Materials derived from natural sources that are used into design typically undergo partial manufacturing

processes and exhibit variations from their original condition. However, this modification enables the utilization of natural materials in many ways, such as incorporating them into marble bench tops and timber flooring/wall panelling. Discussion:

Use of natural materials such as wood and stone are extensively used in the house in the front facade wall, courtyard and inside spaces as a structural element and decorative element. Wood is utilized for intricate carvings, doors, windows,

and various structural elements, infusing the interiors with warmth and natural charm while fostering a sense of connection with the environment.

In parallel, stone is employed extensively in the construction of walls, floors, and ornamental details within the haveli. Providing durability, stability, and an enduring presence, stone contributes to the sense of permanence within the structure. Its natural textures and hues evoke the rugged beauty of the surrounding landscapes, enriching the biophilic appeal of the haveli. Interacting with stone surfaces enhances the tactile connection with nature, promoting feelings of well-being and tranquillity among occupants.

6.2.3. Biophilic Pattern 10: Complexity and order

Complexity and Order encompasses sensory information that follows a spatial hierarchy akin to that observed in natural environments. The objective of this pattern is to create symmetries and fractal geometries that are visually appealing and have the potential to enhance beneficial psychological or cognitive outcomes. The difficulty of this pattern is in achieving equilibrium between a complex and visually stimulating environment, and one that is overpowering and causes stress. The research pertaining to this pattern has expanded via an examination of fractal geometries and preferences in viewing, as well as an exploration of the favourable physiological reactions observed in natural fractals. The term "fractal" denotes a configuration that is fragmented, and in this context pertains to designs or patterns that exhibit similarity and are multiplied and replicated through a scaling ratio. Benoit Mandelbrot, a mathematician, used the term "fractal" to describe natural fractals as geometric shapes that are rough or fractured and may be divided into pieces, each of which is a reduced-size replica of the whole. When nested fractals are scaled with a factor of 3, they tend to exhibit more complexity in comparison to fractals scaled with factors of 1 or 2. Vernacular architecture, such as the colonnade capitals in ancient Greece and Islamic art, as well as crops like cauliflower, exhibit fractal patterns.

DISCUSSION:

The architectural arrangement of Mangaldas ni Haveli frequently integrates symmetrical patterns and proportionate structures, mirroring the orderly principles found in the

natural world. Symmetry is evident in how courtyards, rooms, and architectural elements are organized, creating a harmonious and balanced ambiance reminiscent of natural scenery. This symmetrical layout cultivates a serene and peaceful atmosphere within the haveli, encouraging a sense of well-being and communion with the surrounding environment.

The haveli showcases elaborate architectural features including ornate carvings, delicate latticework, and intricate motifs inspired by nature. These details, mirroring the complexity of natural elements such as foliage, flowers, and animals, demonstrate a meticulous level of craftsmanship.

6.3. NATURE OF SPACE.

6.3.1. Biophilic Pattern 11: Prospect

The Essence of the Space The Prospect pattern posits that humans have a natural inclination towards favouring vast vistas over landscapes. This preference may be attributed to the fact that throughout our evolutionary history, such views have provided us with opportunities for surveillance and planning, thus enhancing our chances of survival. The concept of prospect may be described as an unimpeded visual perception spanning a considerable distance, which engenders a feeling of security and enables individuals to see prospective risks and advantages. Prospect pertains to broader perspectives of our surroundings, encompassing both internal and external aspects. Prospects in interior design include elements such as mezzanine levels, open-plan workplaces, windows with views extending beyond 6 meters, and glass or transparent barriers that provide unobstructed vistas.

Prospect has been found to have possible advantages such as reducing weariness, feelings of vulnerability, stress, and improving comfort levels. Hertzog & Bryce (2007) argue that having views or panoramas that extend beyond 30 meters is more desirable than shorter views (about 5 meters) because it enhances one's comprehension and consciousness of the surrounding environment. The advantages of having a broader perspective include experiencing a sense of ease and decreased levels of tension, particularly in a new environment.

DISCUSSION

Otala, a raised platform and balcony within the haveli offer increased chances for enjoying vistas. Located at elevated heights, these areas offer expansive vistas of the surroundings, allowing residents to appreciate the beauty of the surrounding landscape. Whether utilized for social events, introspection, or leisurely observation, these platforms elevate the biophilic encounter by enveloping residents in the natural sights and sounds of their environment.

Strategically placed windows throughout the Haveli are designed to frame scenic views of the outdoor surroundings. Whether they face the courtyard, or nearby streets, these windows provide glimpses of nature from different perspectives within the haveli. Inhabitants can

appreciate the shifting interplay of light and shadow, and foster a sense of connection with the outside world.

Central courtyard connects the occupants with the rest of the floors and facilitates interaction along with the expansive views of the surrounding landscape. These courtyards serve as focal points within the haveli, offering occupants and visitors opportunities to gaze upon the distant horizon the openness of the courtyards creates a sense of spaciousness and connection with the natural environment, enhancing the overall biophilic experience.

6.3.2. Biophilic Pattern 12: Refuge

Refuge Geographer Jay Appleton introduced the Prospect-Refuge hypothesis in his work "The Experience of Landscape" by emphasizing the relationship and interdependence between the concepts of Refuge and Prospect. According to Beatley (2016), this hypothesis posits that the likelihood of our survival throughout the course of evolutionary history was enhanced by possessing a broad perspective and seeking shelter in caves and cliffs. Hence, the sensation of seeking sanctuary is intensified when combined with the element of anticipation. According to Dosen and Ostwald (2013), the prospect-refuge notion posits that individuals experience restorative benefits, such as emotions of safety and protection, when they are situated in situations that provide enclosure, preferably on three sides, together with favorable outlooks. The tree house can be considered the ultimate combination of Refuge and Prospect, since it provides a partially disguised space for residents to shelter themselves from imagined danger, while yet affording a view that allows for surveillance of the surrounding area.The primary objective of this pattern is to provide residents with a conveniently accessible and safe place, namely a small section inside a bigger room, that facilitates the process of recuperation. Furthermore, the objective is to reduce the visibility of the refuge area. From an architectural perspective, the presence of several sides (protection) enhances the restorative experience. However, an excessive quantity of protection, characterized by full closure, that lacks integration with the surrounding space, is ineffective in producing a sense of sanctuary.

DISCUSSION

The design of Mangaldas Haveli thoughtfully integrates refuge, providing occupants with an array of secluded spaces to find solace, unwind, and recharge amid the serene and beautiful surroundings.

Bhaitak, Parsal and Ordo are the interior spaces of the haveli that offer intimate refuge areas where occupants can seek solace and relaxation. Ordo, a private space and cozy alcove, provide secluded spots for contemplation or quiet activities. Furthermore, soft lighting, comfortable furnishings, and natural materials in the Parsal and Oro, contribute to the sense of warmth and comfort, inviting occupants to unwind and recharge.

6.3.3. Biophilic Pattern 13: Mystery

The presence of mystery in design creates a feeling of excitement that motivates individuals to venture deeper into the area for exploration. This is frequently accomplished by deliberately concealing some perspectives. The primary health advantages are derived from the ability to foresee or anticipate what may be unveiled in the space. The presence of a high- quality mystery condition stimulates interest, leading to the activation of robust pleasure responses in the brain. The activation of VTA dopamine neurons is responsible for these pleasurable reactions, which often occur when an unexpected yet positive event takes place.

The enigmatic pattern fosters locomotion and investigation inside a certain area, with the objective of diminishing tension and facilitating cognitive rejuvenation. Predictably, this trend may be diminished over time with consistent

exposure. Japanese gardens serve as a prime illustration of the concept of Mystery, characterized by intricate pathways, veiled focal points, and intricate mazes that entice visitors to navigate around the gardens.

DISCUSSION

The spatial organization of Interior spaces of Parsal and Ordo areas evoke a sense of mystery and adventure. These spaces are placed at the back of the house and often tucked away behind intricately carved doors or disguised within the walls, waiting to be discovered by curious explorers. Occupants may stumble upon these hidden spaces while navigating the corridors of the haveli, adding an element of surprise and intrigue to their journey through the building.

Hidden passageways, concealed staircases, rooms and circulation space adjoining the courtyard also add a feeling of excitement that motivates individuals to explore the areas.

6.3.4. Biophilic Pattern 14: Risk / Peril

Risk/Peril may be described as an environment characterized by the presence of potential danger, accompanied by a dependable protective measure. The objective of this design pattern is to elicit reactions pertaining to problem-solving abilities, inquisitiveness, and risk evaluation abilities - cultivated throughout our early years.The recognition of a controllable danger has the potential to elicit pleasurable reactions, leading to heightened dopamine levels, akin to the thirteenth pattern of the Mystery. Hence, the incorporation of risk into the design process can provide favorable health consequences. In the case of adults, this can lead to a reduction in the production of dopamine, which is responsible for initiating the fight-or-flight response. Additionally, it can enhance motivation and enhance memory function. There exists a potential for enhancing beneficial health responses through the establishment of a link with

natural systems. One of the primary characteristics of a link to natural processes is the phenomenon of aging and the subsequent temporal changes that transpire throughout time. Natural systems, including aging, change, and the passage of time, elicit a feeling of familiarity and contentment among individuals, even in the face of the unavoidable and subsequent demise and deterioration of all-natural entities.

DISCUSSION

The biophilic element of risk or peril is not typically present in the house design, however few spaces like concealed passages or narrow corridors within the haveli might evoke a mild sense of risk or excitement for occupants exploring the structure. The passage spaces near the staircase are often dimly lit and unexpected turns near the courtyard create as element of uncertainty.

7. CONCLUSION

Analysing the patterns of Biophilic design it can be determined that the Mangaldas Haveli adheres to the principles of Biophilic design. Out of 14 patterns of Biophilic design, 12 patterns have been identified in the building each establishing a very strong connection to nature. It is observed that indirect experiences of nature and experience of space & place are majorly contributing in determining biophilic patterns in the haveli as compared to the direct experience of nature due to the absence of water, plants and trees in the building and surroundings. Despite the location in dense urban fabric and historic context, Haveli demonstrates a compelling example of traditional architecture embodying the principles of biophilic design by offering various experiences of nature in the form of natural materials, patterns and representations that evoke nature's essence. These interventions not only enhance the living quality for its inhabitants but also highlights the relevance of traditional wisdom in contemporary discussions about sustainable and environmentally friendly approaches in urban settings.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

None

REFERENCES

Dubos, René. The Wooing of Earth: New Perspectives on Man's Use of Nature. Scribner, 1980. ISBN 0684165015.
Fromm, Erich.The Anatomy of Human Destructiveness. Fawcett, 1973, p. 366.
Wilson, Edward O.Biophilia. Harvard University Press, ISBN 0674
Terrapin Bright Green.The Economics of Biophilia. Terrapin Bright Green, LLC, 2014.
Stephen R. Kellert, Elizabeth F. Calabrese. The Practice of Biophilic Design www.biophilicdesign.com.
UNESCO World Heritage Convention Criteria, Date of Inscription 2017).
Matthijs Van Oostrum, The Making of the Old City of Ahmedabad. Intach, New Delhi, 8 Jan. 2018, p. 127.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 110–116

AR/VR TECHNOLOGICAL INTERVENTION IN DESIGN EDUCATION FOR PRODUCT VISUALIZATION

Mukesh Malviya[1], Neeraj Setpal[2], Kapil Sharma[3]

[1, 2, 3]Avantika University, Ujjain

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1271

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

It is essential to study the inevitable impact of technology on teaching in design education, specifically the methods of concept visualization. The new AR/VR technologies may have the potential to revolutionize the way product visualization is taught in Design Schools. In Industrial designing, Sketching and manual color renderings have been considered the standard practice for initial concept generation for developing tangible three-dimensional products. For three-dimensional visualization, the CAD model of a selected few ideas are generated at later stages of product development. That may give a very close-to-real view of the product on a computer screen but with constraints that can be overcome only with an actual physical prototype. Incorporating AR and VR techniques with traditional sketching methods and prevailing CAD tools may leverage an individual's learning experience of realizing ideas for products. The immersive experience of AR/VR tools may bring better engagement and a higher attention span to students. With a three-dimensional workspace, students can overcome the limitations of two-dimensional concept visualization. Interactive aspects of such technological tools bring better control benefits of color, orientation, size, and fast iteration in representing ideas. Live product experience will give students a closer view of their ideas with the final product at the early development stage. This paper investigates the benefits and challenges of adopting an AR/VR tool along with teaching conventional sketching methods for building the visualization skills of students. This study is an outcome of an elective course on Product visualization conducted as part of the Master of Design program at Avantika University.

Keywords: Product visualization, design education, augmented reality, virtual reality, immersive learning, pedagogy, creativity, Gravity Sketch, and collaboration

1. INTRODUCTION

To prepare students for professions in industries like industrial design, product design, architecture, and user experience (UX) design, design education always requires continuous updates. The development of good visualization abilities is essential to this education because it allows pupils to convert abstract concepts into tangible forms and functions. To teach these skills, design educators have traditionally used a combination of manual drawing, CAD modeling, and physical prototyping. Although these approaches have shown to be successful in some situations, they frequently need more immersive and interactive elements for students to understand the intricacies of three-dimensional design.

With the development of AR and VR technology, there is a rare chance to enhance traditional design pedagogy with hands-on, interactive, and immersive learning opportunities. Students can now explore design concepts in unthinkable ways in advance. Recent AR/VR tools have the power to simulate real-world locations and visualize surfaces/materials, and interactions. With an emphasis on product visualization, we investigate the transformative potential of AR and VR technological interventions in design education in this study (Chandrasekera and Yoon 1-13).

One objective of this paper is to understand how adopting new AR/VR technological methods for teaching will alleviate all the above dimensions with respect to individual Cognitive ability, Individual personality, physiological, psychological state, and internal emotional strength.

2. AR AND VR IN DESIGN EDUCATION

Technologies such as virtual reality (VR) and augmented reality (AR) provide new possibilities for experiential learning in design education. With AR/VR tools, students may handle virtual items in three-dimensional space and interact with them, unlike traditional teaching approaches that mostly rely on two-dimensional representations. In addition to improving students' spatial reasoning skills, this experiential learning method helps them develop a deeper comprehension of form, scale, proportion, and materiality.

When it comes to product visualization, AR/VR technologies let students examine virtual versions of their designs in a variety of settings, with varying lighting, and from different angles. Before committing to prototypes, students can find design problems, try different configurations, and make educated decisions by immersing themselves in these virtual settings.

Moreover, AR/VR technologies support cooperative design methods by letting students collaborate in real time on the creation of virtual prototypes. Students may easily communicate using AR/VR tools, whether they are in the same physical place or connected remotely over the internet. This fosters a culture of shared ownership, communication, and teamwork.

3. LEARNING METHODS

Each student has a unique learning style, and their response also varies for any lesson offered, but teaching materials play an important role in making learning effective. Good learning not only depends on students' learning style, but also depends on teaching materials used (Alan Pritchard). There is much research and many models proposed on learning styles. VARK learning style by Fleming (Drago and Wagner 1–13) focuses on Visual, Aural, Read or Write and Kinesthetic aspects of learning. In design education, Reading, writing, and auditory lessons help students to understand the background of assignment/need/idea, for which concepts to be generated. While generating ideation concepts or finding problem solutions, visual cue precedes over to visualize. Hand muscle movement and motor controls help translate visualization on paper in conventional sketching. With AR/VR tools, students can experience a completely new paradigm of immersive learning where visual and kinesthetic aspects are leveraged. Almost complete body movement get involve, giving high Kinesthetic experience.

In a study undertaken, four general dimensions of learning styles are identified (Drago and Wagner 1–13):

A. Cognitive
B. Affective
C. Physiological
D. Psychological

These four dimensions will be considered while assessing students' learning. Adopting new AR/VR teaching technology will improve individual motivation and higher physiological and psychological involvement.

4. AR/VR INTERVENTIONS' ADVANTAGES FOR DESIGN EDUCATION

There are numerous advantages for both instructors and students when AR/VR technology is used in design instruction. During our classroom experiments with AR/VR assignments, we observed several benefits among the students which are as follows:

a) **Enhanced Visualization Skills** Students' spatial reasoning and visualization skills are enhanced when they can see intricate design concepts in three dimensions. One can move the objects/products in a 3D virtual space to get a real-life user experience. It is not only expanding their imaginative thinking but also strengthening their form of understanding more rationally.
b) **Instant feedback** on design iterations is provided by AR/VR environments, enabling students to promptly see and resolve possible problems before they get out of hand. Rectifying the curves/surfaces/ forms is much quicker and easier and can be achieved with desired intentions with a great emotive jolt.
c) **Immersion Learning**: Students can study design principles in ways that are not possible with traditional teaching methods by immersing themselves in virtual worlds. This improves their comprehension and memory of the course material.

d) **Interdisciplinary Collaboration:** By enabling students from various disciplines to collaborate on common creative projects, AR/VR technologies foster interdisciplinary collaboration by encouraging the exchange of ideas and viewpoints. In our daily studio interactions, students were from Industrial design, Transportation design.

e) **Resource Optimization**: AR/VR technologies help to streamline the design process by eliminating the need for physical prototypes and travel expenses, which helps to save money and time for educators and students alike.

f) **Access to Remote Learning Opportunities**: Students in underserved or remote locations now have greater access to high-quality education thanks to AR/VR technologies, which allow them to take part in immersive learning experiences from anywhere in the world.

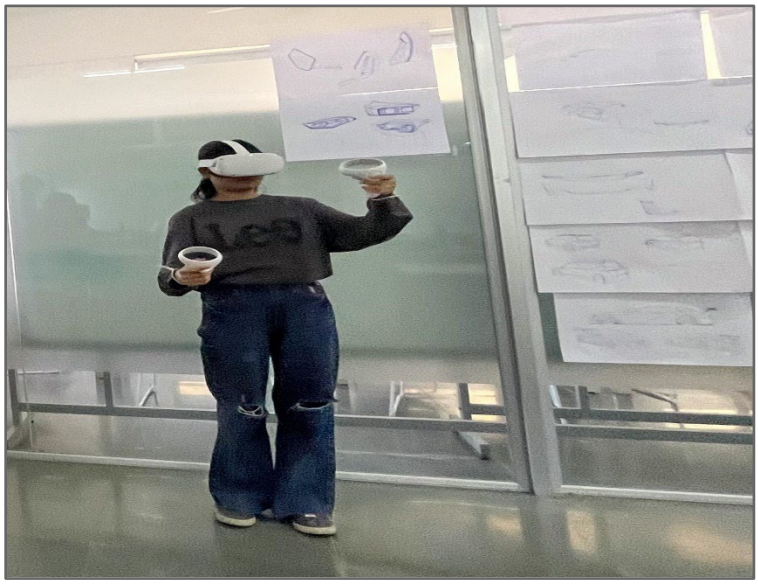


Fig. 1. Students wearing AR/VR 'Meta Quest' headset performing sketching.

Fig. 2. Students wearing AR/VR 'Meta Quest' headset work reflecting on screen.

COURSE DELIVERY - As part of a course on Product visualization, students were given a brief introduction to AR/VR tools in addition to conventional sketching methods. A module was developed for a class of seven students, to understand the comparative benefits of this technology in a better way and give a holistic virtual classroom experience to our design students. A total of five students participated in the course.

HARDWARE/SOFTWARE REQUIREMENTS

Meta quest-2 and Meta Quest Pro Headsets with pairing hardware such as large display for review and a latest computer system.

ASSIGNMENT

COLLABORATIVE DESIGN PROJECTS: All students were given the task of creating concepts of any product of their choice. Together they collaborate to develop concepts initially on paper and later iterate similar ideas using Gravity Sketch, an AR/VR tool. While students engaged in visualization and developing ideas, emphasis was also given to idea communication and collaboration.

Presentation: Students will practice presenting their design concepts in virtual environments, focusing on storytelling, visual communication, and the ability to articulate design rationale.

ASSESSMENT CRITERIA:

a) Creativity and Innovation: Assessing the originality and novelty of design concepts.
b) Technical Proficiency: Evaluating students' mastery of AR/VR tools and techniques.
c) Design Process: Assessing students' ability to iterate on designs, incorporate feedback, and refine their concepts.
d) Presentation Skills: Evaluating students' ability to effectively communicate their design ideas in virtual environments.
e) Collaboration and Teamwork: Assessing students' ability to collaborate with peers and contribute effectively to group projects.

These modules and assignments aim to provide students with a comprehensive understanding of AR/VR sketching and visualization techniques while equipping them with the skills necessary for successful careers in industrial and transportation design.

5. CHALLENGES AND CONSIDERATIONS

Although there is no denying the advantages of AR/VR interventions in design education, their successful adoption will depend on several factors, including:

a) **TECHNICAL COMPLEXITY:** At present, implementation of AR/VR technologies for teaching can be resource intensive, necessitating specialized training, hardware, software, and technical know-how. With time these would become more affordable and easily adoptable.
b) **FINANCIAL CONSTRAINTS**: Many educational institutions continue to face the financial problem of providing all students, regardless of socioeconomic level or geographic location, with equitable access to AR/VR technologies.
c) **PEDAGOGICAL INTEGRATION:** To ensure alignment with learning objectives in integrating AR/VR tools into current curriculum utmost care requires. Reviewing assessment techniques, instructional practices, careful planning, and collaboration must be considered before implementation.
d) **ETHICAL AND PRIVACY CONCERNS:** The use of AR and VR technology raises significant ethical and privacy issues about permission, data security, and surveillance. Data storage happens in cloud-based platforms with prevailed safety concerns. These issues need to be addressed with explicit regulations and guidelines.
e) **TRAINING AND PROFESSIONAL DEVELOPMENT**: To get familiar with AR/VR technology and create successful teaching practices, educators may need to take advantage of possibilities for training and professional development.

The potential advantages of AR/VR interventions in design education are too great to be disregarded, notwithstanding these difficulties. Through the integration of cutting-edge technologies and inventive teaching strategies, educators in the field of design can enable students to develop into imaginative, analytical, and socially conscious designers capable of addressing the intricate problems facing the 21st century.

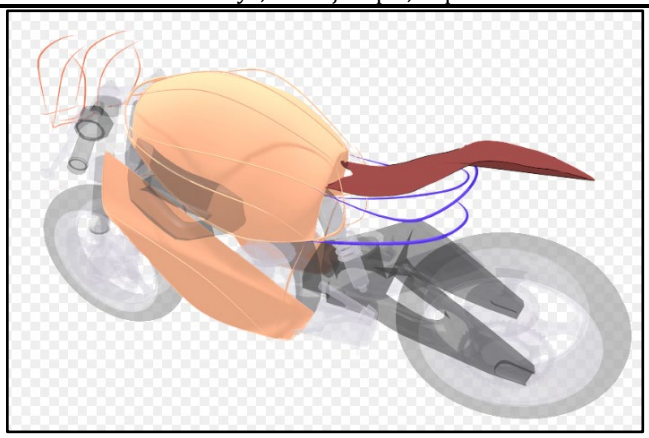


Fig. 3. Neeraj Setpal (Instruction sketch of Motorcycle)

STUDENTS WORKS:

Following images shows comparison of outcome though manual sketching vs AR/VR tool Gravity Sketch

MANUAL SKETCHES VS GRAVITY SKETCH

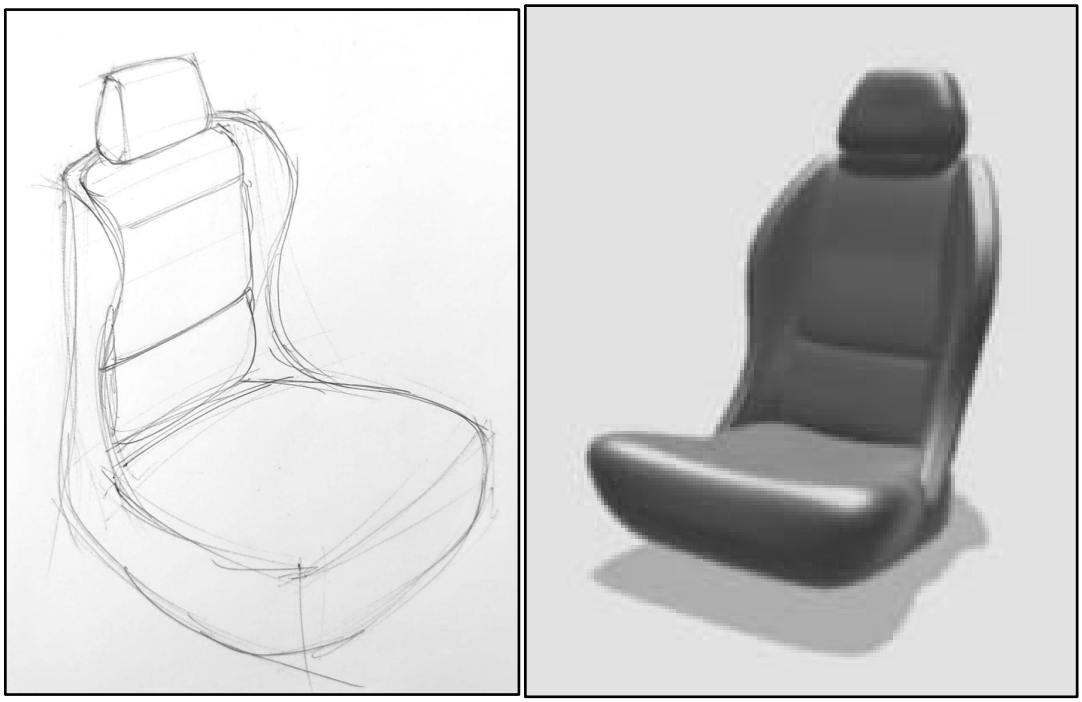


Fig. 4. Rohan Paradkar (Car seat)

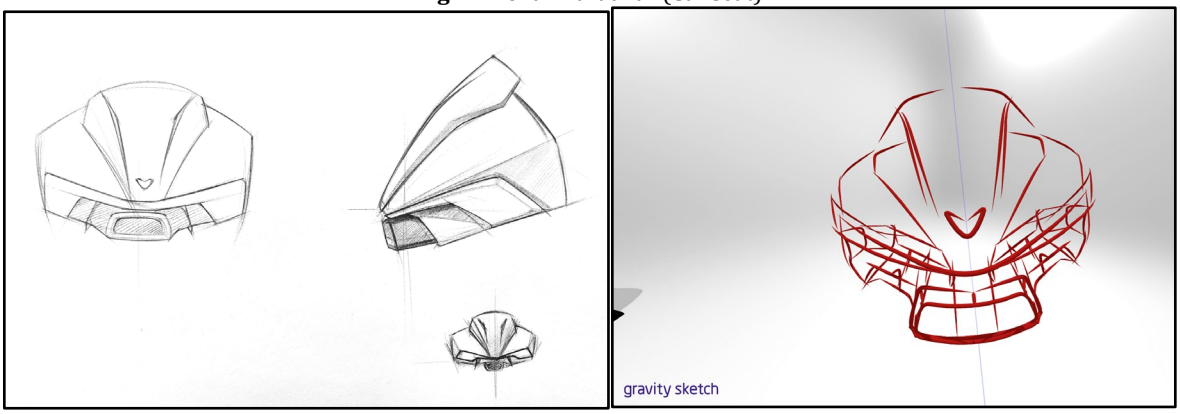


Fig. 5. Satyajit Shubhankar (Motorcycle headlamp)

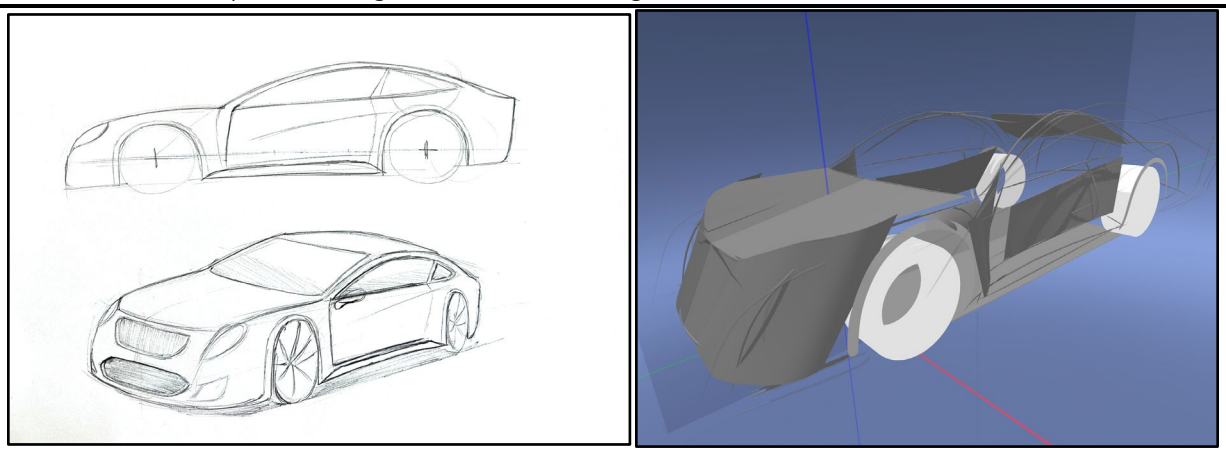


Fig. 6. Bhishmak Taunk (Sedan Car)

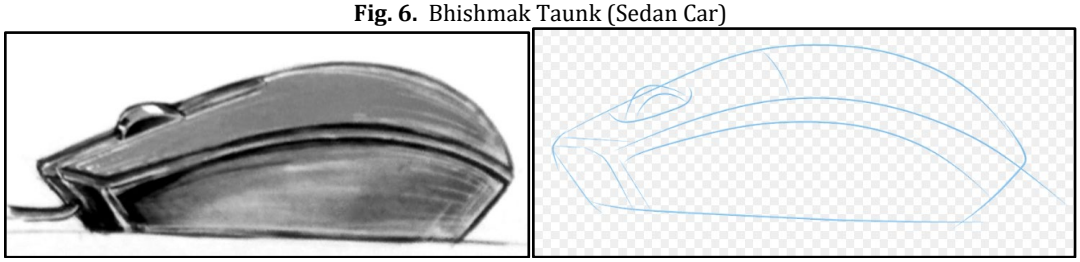


Fig. 7. Tanvi Singh (Sport Car)

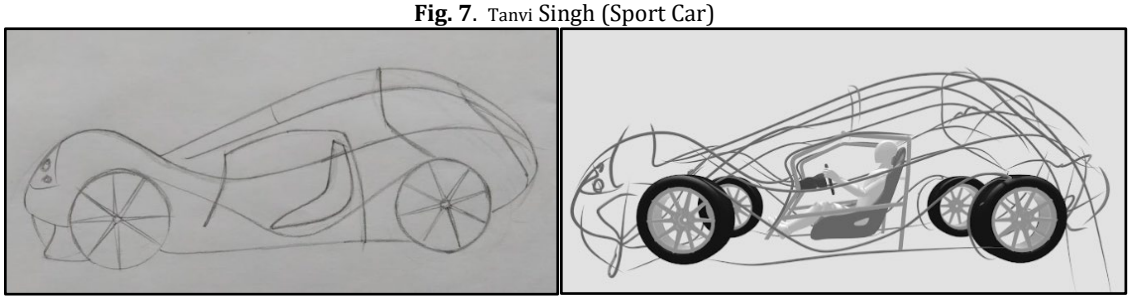


Fig. 8. Ankit Singh (Sport Car)

FEW COLLECTIVE FEEDBACK BY THE PARTICIPANTS ON MAKING A DESIGN CONCEPT WITH VR/AR METHODS ARE AS FOLLOWS:

1. Visualizing and making the product or any 3d model can be easy while using VR because one can see their products or models in an environment while looking at it at the same time.
2. Conventional processes need 3d modeling and rendering for visualizing. It can be an easy way to model or make a 3d model if someone is not that good at drawing or sketching. But on the other hand, good sketching can help one to make the model even better than conventional methods.
3. Using Gravity Sketch was totally a new and innovative experience to create and see ideas directly in a 3D space. The silhouette which is used to draw on a 2D surface - paper or digital, was possible to draw in 3D giving it the required depth with the stroke of my hand movement only. There was no requirement now to shade or give highlights to show the depth and curvature of a surface.
4. Giving initial volumes was a bit challenging to learn to do in a new atmosphere, while it also kept the constant interest to do better in this atmosphere. Provided ability to zoom, pan and rotate a 3D sketch with hand gesture movements, allowing anyone to understand the depth of curvature of line strokes and surfaces.
5. Surfacing, which takes a lot of hardship in CAD software was so much simpler to understand in Gravity Sketch - just draw two lines and using both the hands apply a surface between the two lines which feels like using sheet metal and applying it by hand. The curvature of the surface didn't even need a guide rail through its center to define the curvature as needed in CAD software. It was possible to just move our wrist in the angle of which the curvature is needed.
6. The templates given in the application for bikes and automobiles are helpful in designing their components over a pre-made chassis of the vehicle.

7. It is to believe that this application holds a great potential for designers in the industries. Be it product design or transportation design - this application gives a lot of freedom to give its users the accessibility to explore their ideas in a quick and effective manner. Gravity Sketch will save the time required in designing a form or product and will also provide a useful output required to show one's skills and ideas at the industrial level.

6. CONCLUSION

In conclusion, by giving students immersive, interactive, and experiential learning opportunities, AR/VR technologies have the potential to completely transform the field of design education. Design educators may improve students' visualization abilities, encourage interdisciplinary cooperation, and get them ready for professions in design and innovation by utilizing these tools.

Student feedback and observations as per VARK learning methods clearly indicate a longer attention span with higher kinesthetics involvement.

The revolutionary potential of AR/VR interventions in design education is evident, despite the remaining limitations. Educators, legislators, and industry stakeholders must collaborate to fully utilize AR/VR technology to build a more egalitarian, inclusive, and sustainable future for design education.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

None

REFERENCE

Pritchard, Alan. Ways of Learning: Learning Theories for the Classroom. Routledge, 2018.

Drago, William A., and Richard J. Wagner. "Vark Preferred Learning Styles and Online Education." Management Research News, vol. 27, no. 7, 1 July 2004, pp. 1–13, doi:10.1108/01409170410784211.

Chandrasekera, Tilanka, and So-Yeon Yoon. "The Effect of Augmented and Virtual Reality Interfaces in the Creative Design Process." International Journal of Virtual and Augmented Reality, vol. 2, no. 1, Jan. 2018, pp. 1–13, doi:10.4018/ijvar.2018010101.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(1 ICETDA24), 139–149

USER-CENTRIC DIGITAL SOLUTION FOR DIABETIC PATIENTS

Manali Purohit [1], Dr. Ravindra Bachate [2]

[1] Student, M.Des, Faculty of Art and Design, Vishwakarma University, Pune, Maharashtra, India
[2] Sr. Assistant Professor, Department of User Experience Design, School of Design, MIT Academy of Engineering, Pune, Maharashtra, India

ABSTRACT

Diabetes is a common autoimmune disorder that affects millions of individuals worldwide, necessitating careful management and support. This research paper explores the multifaceted aspects of the user experience (UX) of diabetes patients, understanding their unique needs, challenges, and the potential for improving their quality of life through innovative design solutions. Our research methodology included in-depth interviews, surveys, and user observations, engaging a different types of diabetes patients. The insights underscore the significance of personalized, empathetic, and user-centric design in enhancing the UX of diabetes patients. The paper concludes by discussing key recommendations for future design, emphasizing the need for a holistic strategy that covers both the psychological and physiological aspects of diabetes care.

Keywords: Autoimmune Disorder, Diabetes, Digital Solution, User Experience Design

Corresponding Author
Manali Purohit,
pmanali2000@gmail.com

DOI 10.29121/shodhkosh.v5.i1 ICETDA24.2024.1277

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

1. INTRODUCTION

1.1. WHAT IS DIABETES?

Diabetes is a long-term metabolic disease characterized by elevated blood sugar levels, sometimes referred to as hypoglycemia. This disorder develops when the pancreas either cannot create enough insulin or the body is unable to use the insulin that is produced. Insulin is necessary for the uptake of glucose by cells, which use it as their primary energy source.

There are three main types of diabetes:

- *Type 1 Diabetes:* This is an autoimmune disorder when the immune system unintentionally targets and kills the pancreatic beta cells that produce insulin. People with type 1 diabetes thus either produce very little or no insulin. Typically, this kind

of diabetes appears when blood sugar management is being maintained. Thirteen is the median age at T1D diagnosis. In India, there are roughly 8.6 lakh individuals with T1D[16].

- *Type 2 Diabetes:* This is the most common kind of diabetes, affecting over 90% of total cases. It occurs when the body grows resistant to the effects of insulin and the pancreas fails to generate enough insulin to overcome this resistance. Type 2 diabetes is often associated with factors such as obesity, inactivity, genetics, and age. Initially, diet, exercise, and medication are used to control type 2 diabetes, but in some cases insulin treatment may be needed. About 25 million Indians are pre-diabetic, and 77 million adults over the age of 18 are expected to have type 2 diabetes[17].
- *Gestational Diabetes:* Approximately 90% of cases of diabetes are of this kind, making it the most prevalent type. It occurs when the body develops an immunity to the effects of insulin due to insufficient insulin production by the pancreas. Numerous factors, including age, genetics, inactivity, and obesity, are linked to type 2 diabetes. Type 2 diabetes is primarily managed with food, exercise, and medication; but, in certain circumstances, insulin therapy may be required. About 25 million Indians are pre-diabetic, and 77 million adults over the age of 18 are expected to have type 2 diabetes[18].

1.1.1. WHAT ARE THE CAUSES AND RISK FACTORS OF DIABETES?

The primary cause of diabetes is a complex interaction between inheritance and environmental factors. Risk factors for Type 2 diabetes include aging, obesity, sedentary lifestyle, bad eating habits, poor family history of diabetes, and ethnicity. Diabetes is a severe condition that, if left untreated, can lead to several issues with the kidneys, heart, eyes, nerves, and blood vessels. Diabetes must be managed to reduce the risk of complications by maintaining a healthy lifestyle, checking blood sugar frequently, and according to medication guidelines. Over 50% of people do not realize they have diabetes, which can lead to health problems if it is not detected and treated in a timely manner.

1.1.2. WHAT ARE THE COMMON SYMPTOMS OF DIABETES?

Diabetes symptoms might change based on the kind of diabetes and how it progresses. Diabetes frequently manifests as increased thirst, increased hunger, sluggish wound healing, inexplicable weight loss, and frequent urination. But not everyone with diabetes will show symptoms, particularly in the early stages of the condition.

1.1.3. WHAT ARE THE PROBLEMS RELATED TO DIABETES?

- Hyperglycaemia result in symptoms such as increased thirst, frequent urination, fatigue, and blurred vision.
- Hypoglycaemia can lead to symptoms like shakiness, dizziness, sweating, confusion, and in severe cases, unconsciousness or seizures.
- Cardiovascular Complications can increase the risk of heart disease, stroke, and high blood pressure.
- Itching, numbness, or discomfort in the hands and feet are signs of neuropathy.
- Retinopathy which may cause vision problems and, if left untreated, even blindness.
- Kidney Diseases
- Foot Problems can increase the risk of foot infections.
- Skin Complications such as dry skin, fungal infections, and slow-healing wounds.
- Gastroparesis can lead to symptoms like nausea, vomiting, and delayed stomach emptying.
- Depression and Anxiety: Managing diabetes can be challenging, leading to emotional stress and an increased risk of depression and anxiety.

1.1.4. WHAT ARE THE COMPLICATIONS FACED BY DIABETIC PATIENTS?

Diabetes that is not treated or is poorly managed can have serious side effects on several organ systems and drastically lower a person's quality of life. Cardiovascular disease, neuropathy (damage to the nerves), retinopathy (injury to the eyes), nephropathy (damage to the kidneys), and an elevated risk of foot ulcers and amputations are long-term consequences [19].

1.1.5. DIAGNOSIS AND SCREENING

Blood glucose levels are measured using a variety of procedures, such as the oral glucose tolerance test (OGTT), fasting blood glucose test, and the HbA1c (glycated haemoglobin) assessment, in order to diagnose diabetes. Initiating proper care and preventing complications require early identification.

1.1.6. TREATMENT AND MANAGEMENT

The goals of managing diabetes are to attain and sustain ideal blood glucose levels, reduce complications, and improve general health. Treatment options include insulin therapy, diet and activity adjustments, oral medicines, and, in certain situations, further adjuvant therapies such SGLT2 inhibitors and GLP-1 receptor agonists.

1.1.7. WHAT ARE THE PREVENTIVE MEASURES OF DIABETES?

Since diabetes has a major negative influence on public health, prevention is essential to slowing the disease's course. Programs for preventing diabetes emphasize adopting a healthy lifestyle, increasing public awareness, and changing laws to support exercise and a balanced diet.

2. RELATED WORK

2.1. LITERATURE REVIEW

The studies by Afif Nakhleh and Nami Shehadeh [8] underscore the significance of keeping patients with type 1 and type 2 diabetes from experiencing low blood sugar. Their methodology involves approaches like patient education, dietary changes, exercise recommendations, glucose monitoring, and medication adjustments to manage hypoglycaemia effectively.

Shiwali Goyal, Jyoti Rani et al. [5] explore the potential of transomics in understanding the genetic determinants of diabetes. They prescribe personalized diabetes care using patient molecular genetic profiles that include factors such as physical activity, dietary changes, stress management and optimized diagnostic approaches. Work by Abhijit S. Rayate et al. [10] addresses foot wound healing, highlighting methods with antibacterial effects and wound healing actions supported by clinical human studies. Research of Kimberley J. Smith et al.'s [12] focuses on understanding lifestyle changes that contribute to anxiety and depression in patients. Their findings emphasize the importance of promoting the mental health of people with diabetes by effectively treating symptoms of anxiety and depression.

Sebnem Çinar et al. [15] focus on Type 2 diabetic patients' depression, anxiety, quality of life, and sleep and provide an overview of the interaction between diabetes and mental well-being. Maureen Monaghan, et al. [7] update behavioural research in young toddlers with diabetes type 1 and outline current priorities and future directions for treating this disease in children.

G. Alexander Fleming et al. [3] explore obstacles to the use of digital medical technology, namely applications in diabetes treatment and self-care, while noting the rapid integration of such technologies and the issues that come with it. A study by Dante Salvador et al. [11] shows an association between type 2 diabetes and an increased risk of death, after factors such as heart failure are taken into account the relationship between diabetes and other health conditions.

Eduardo Tibiriçá et al. [13] indicate that patients with type 1 diabetes and vascular difficulties have higher skin capillary density, which might provide insight into diabetic complications. Xian Wang et al. [14] focus on skin problems in patients with T2D and treat those most affected by such problems Arielle G. Asman et al. [1] highlight how people with diabetes, anxiety, and depression often associate these symptoms with their condition or prescribed medications, emphasizing the importance of addressing mental health perceptions

Maria Felicia Faienza et al. [2] propose interventions to prevent poor bone quality in type 2 diabetes and suggest possible strategies to mitigate this complication. The study by Katherine Ogurtsova et al. [9] provides point estimates for diabetes but lacks measures of uncertainty, which may reflect the need for further refinement of the data. Lara Frommer and George J Kahaly [4] compare social, medical, and biological characteristics of patients with isolated type 1 diabetes and related autoimmune diseases (AIDs) to improve clarity of the complexity of autoimmune diseases

Reza Mohebi et al. [6] suggests a possible role for insulin-like growth factor (IGF) biology in CVD risk in T2D and offers insight into the complicated link between diabetes and cardiovascular health.

2.2. COMPETITIVE ANALYSIS

The competitive analysis of various digital products available in the market is performed. This study helped to understand the current market trend, available features and techniques to help diabetic patient and opportunities where the work can be done.

Table 1: Competitive Analysis of Applications Currently Available for Diabetic Patients

	MySugr	BlueStar Diabetes	Diabetes Connect- Blood Sugar Control	One Drop	BeatO
Target Audience	People with diabetes who want to track blood sugar levels, medication, and daily activities.	People with T1D or T2D looking for personalized diabetes management.	Individuals with diabetes seeking blood sugar control and monitoring.	People with diabetes seeking personalized coaching and community support	T1D and T2D Patients
Competitors	Glucose Buddy, Glooko, Diabetes:M.	One Drop, mySugr, Glucose Buddy.	Glucose Buddy, mySugr, Glooko	BlueStar Diabetes, mySugr, Glucose Buddy	mySugr
Services	Blood sugar tracking, insulin dosage, carbohydrate counting, data visualization, reminders.	Blood sugar tracking, personalized coaching, medication management, nutrition guidance.	Blood sugar tracking, medication management, diet and exercise monitoring	Blood sugar tracking, in-app coaching, medication reminders, food logging, community forum	Blood glucose tracking, diabetes-friendly recipes, doctor consultations, medication reminders
Strengths	User-friendly interface, extensive data tracking, integration with glucose	Clinically validated, personalized support, integration with connected devices.	Easy-to-use interface, medication reminders, ability to track meals and exercise	Personalized support, educational resources, social engagement features	Comprehensive diabetes management services, access to diabetes experts, recipe library

	meters and fitness trackers				
Weaknesses	Some advanced features may require a premium subscription, occasional syncing issues with external devices.	Requires a prescription for full access, potential cost barrier for some users	Limited features in the free version, occasional app stability issues	Subscription-based model, may not have all the advanced data tracking features of other apps	Limited integration with third-party devices, may require a subscription for certain features
Threats	Competition from other diabetes tracking apps, potential data privacy concerns.	Competition from other well-established diabetes apps, changes in healthcare regulations	Strong competition from other diabetes apps, changing user needs and expectations	Competition from other coaching-focused diabetes apps, potential user retention challenges	Competition from other established diabetes management apps in India.
Opportunities	Expanding to international markets, collaborating with healthcare providers for data-sharing integrations.	Partnering with health insurance companies for coverage, expanding to international market	Collaborating with healthcare providers for data exchange, integrating with smartwatches and wearables.	Expanding the coaching platform to other chronic conditions, partnering with health insurers for coverage.	Partnering with healthcare providers for better integration and data sharing.

2.3. INTERVIEWS AND SURVEYS

We performed some interviews and surveys using the desk research as a basis. The questions were constructed in a way that can help in understanding the difficulties patients may encounter in daily life and the features that may be necessary for them. How the patients managing their diabetes and other activities in another important factor. The below graph shows the results of the primary research.

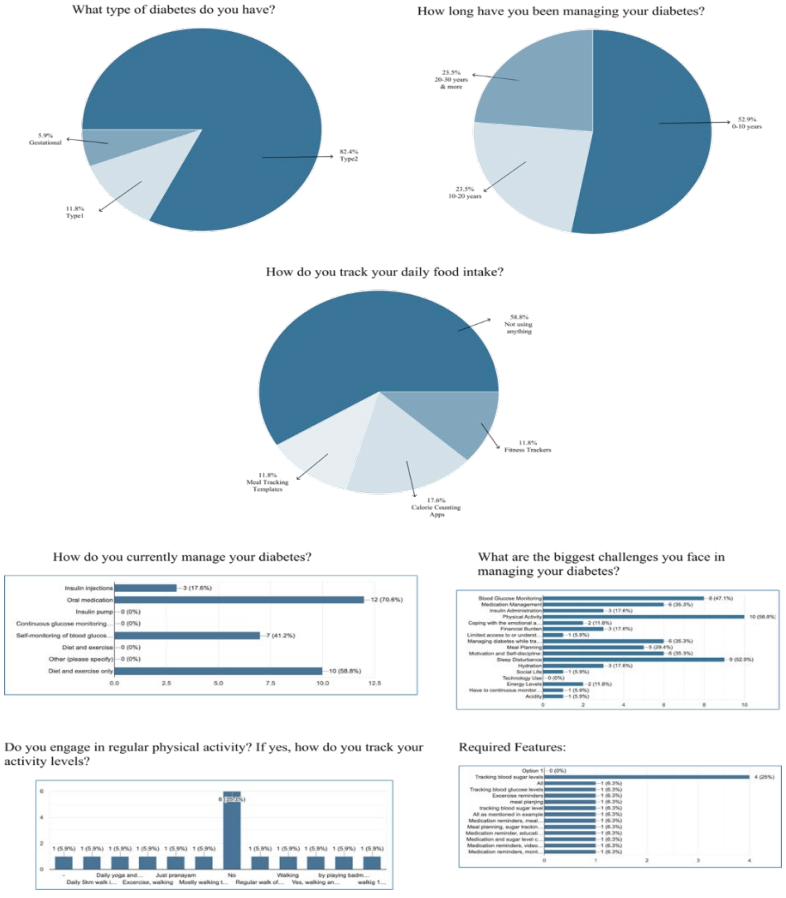


Figure 1. Survey Insights Representation

Insights of Primary Research about the Diabetic patient

- Do not take proper care of physical health and meals
- Forget to check sugar level on regular basis
- Negative impacts on daily life
- Forget to take medication properly
- Doesn't know about the communities available that are primarily working for them

- Diabetes affects mental health as well

2.4. UNDERSTANDING PROBLEM

2.4.1. FLOW MODEL

The flow model offers a clear and detailed visual representation of how different people and elements come together to support diabetic patients. It starts with the initial diagnosis and moves through treatment planning, where doctors prescribe medications and suggest lifestyle changes. Pharmacists play a key role by dispensing medications and providing crucial information. The model also highlights the daily management of diabetes, showing how friends and guardians provide emotional support and help with meal planning, encouraging physical activity, and reminding patients about their medication and appointments.

Additionally, the flow model emphasizes the importance of regular check-ups with healthcare providers to monitor progress and make necessary adjustments to the treatment plan. It also includes the role of support groups and community resources in offering extra help and education to both patients and their caregivers. Overall, this model visually captures the interconnected and dynamic nature of managing diabetes, illustrating how different people work together to ensure the well-being of diabetic patients throughout their journey.

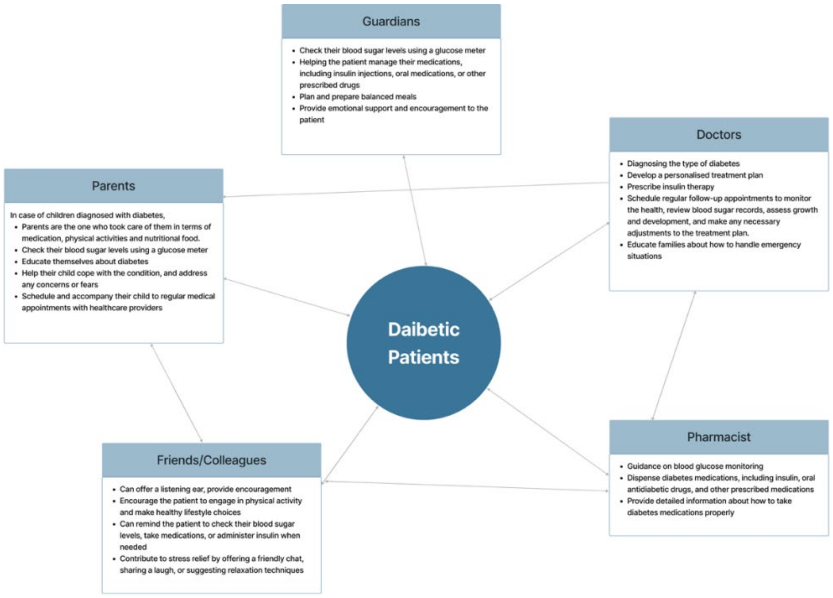


Figure 2. Flow Mode

2.4.2. HOFESTEDE'S CULTURAL MODEL

The Hofstede cultural model has helped us grasp how cultural factors influence people with diabetes, their loved ones, and medical professionals. This model highlights the diverse cultural attitudes and practices related to diabetes care in India, emphasizing the need for cultural sensitivity and awareness when providing support and treatment.

By understanding and respecting these cultural differences, healthcare workers and loved ones can more effectively help diabetic patients manage their condition and achieve better health outcomes. This cultural awareness is essential for creating personalized care strategies that fit patients' values and lifestyles, ultimately enhancing their quality of life.

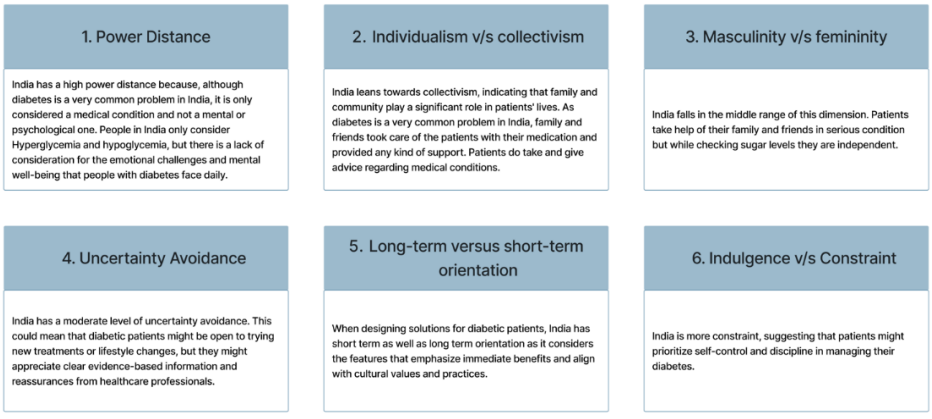


Fig. 3. Hofstede's Cultural Model

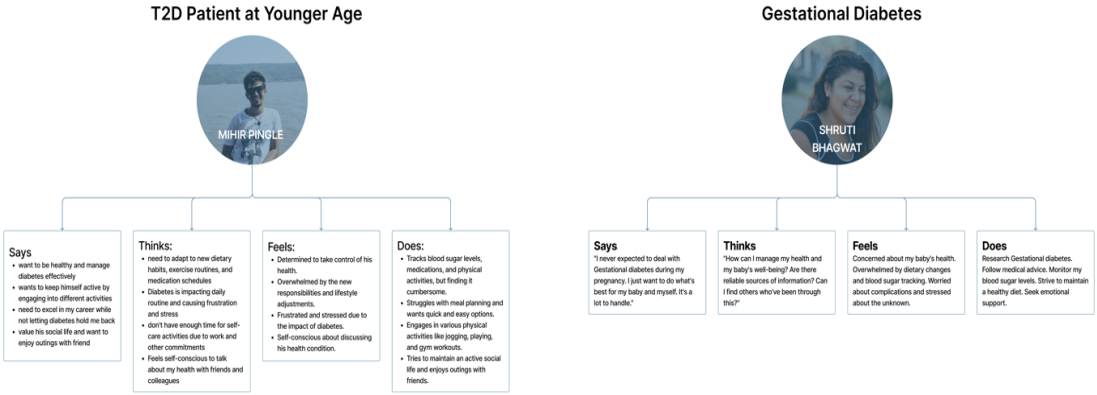
2.4.3. USER PERSONAS

When developing personas for diabetic patients, we identified four distinct groups. The first group consists of younger individuals with Type 2 diabetes, and the second group includes older adults with the same condition. The third group comprises patients experiencing gestational diabetes. Finally, the last group includes parents whose children have been diagnosed with diabetes.

Fig. 4. User Personas

2.4.4. EMPATHY MAPPING

Empathy mapping is a collaborative strategy that facilitates a better understanding of the specified groups and helps understand the emotions and thoughts of a diabetic group. We have performed empathy mapping for T2D patient at younger age, gestational diabetes, T2D patient at old age and T1D in child age.



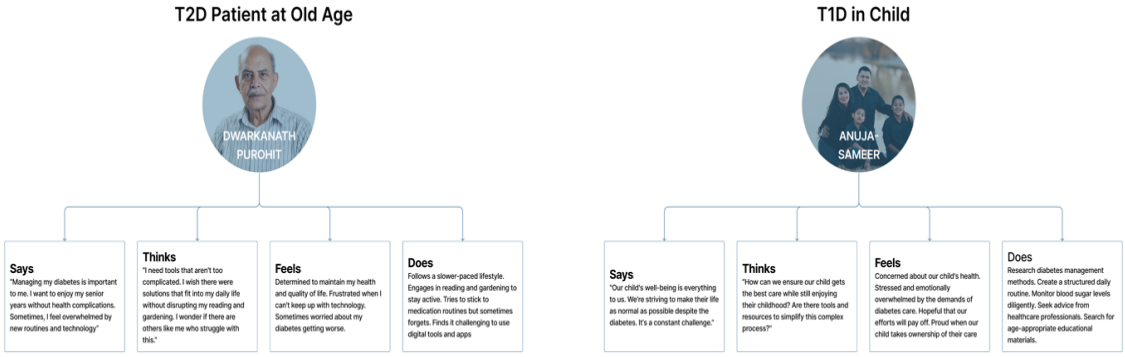


Fig. 5. Empathy Mapping

2.4.5. RESEARCH GAP

One of the significant research gaps in the domain of Human Computer Interaction (HCI) and Diabetes is the limited focus on understanding the emotional and psychological aspects of managing diabetes through technology.

2.4.6. PROBLEM STATEMENT

Individuals with diabetes often overlook the importance of consistent blood glucose monitoring and medication adherence. Neglecting proper dietary management and physical activity can contribute to feelings of anxiety and depression. This statement emphasizes the need for a more engaged approach to diabetes self-care to prevent psychological distress.

3. PROPOSED SOLUTION

At the ideation stage we have performed various methods such as mind mapping, card sorting and information architecture to find the possible solutions to deal with the diabetes using digital solution. These methods are discussed below.

3.1. MIND MAPPING

To better manage diabetes, we used a detailed mind mapping method to understand and represent the many aspects involved. This process helped us dive deep into several important areas. We talked about the different types of diabetes, such as Type 1, Type 2, and gestational diabetes, and looked at the risk factors, which include things like genetics, lifestyle choices, and environmental influences. We also identified common symptoms that diabetic patients experience, such as frequent urination, excessive thirst, and fatigue.

We explored the daily challenges that people with diabetes face, from managing their medication schedules to dealing with the emotional and psychological impacts of the disease. It was essential to understand what patients expect, like having access to reliable healthcare information, user-friendly digital tools, and robust support systems to help them manage their condition better.

Preventive measures were another critical focus. We discussed the importance of a healthy diet, regular exercise, and routine medical check-ups to prevent or slow down the progression of diabetes. We also reviewed the existing solutions available to patients, including current medical treatments, technological aids like continuous glucose monitors and insulin pumps, and lifestyle changes.

All these discussions and findings are summarized in Figure 6. This figure provides a clear and structured overview of the various dimensions of diabetes management, highlighting the interconnected elements that are crucial for effective disease control and better patient.

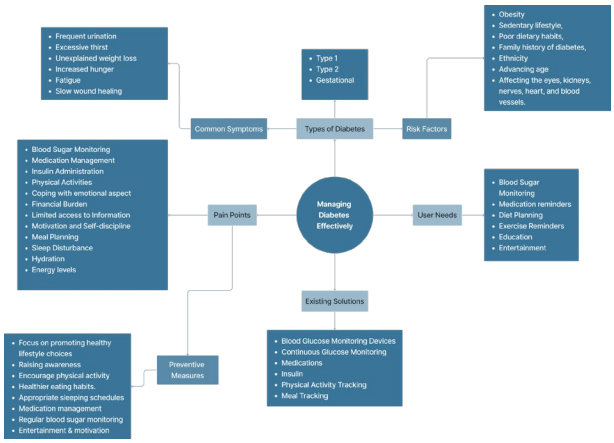


Figure 6. Mind Mapping for Managing Diabetes Effectively

3.2. CARD SORTING

At the ideation stage, many features were listed that can be included in the diabetic management digital product. Then we performed a card sorting to categorize the features and its hierarchy. The figure 7 shows the details of the card sorting.

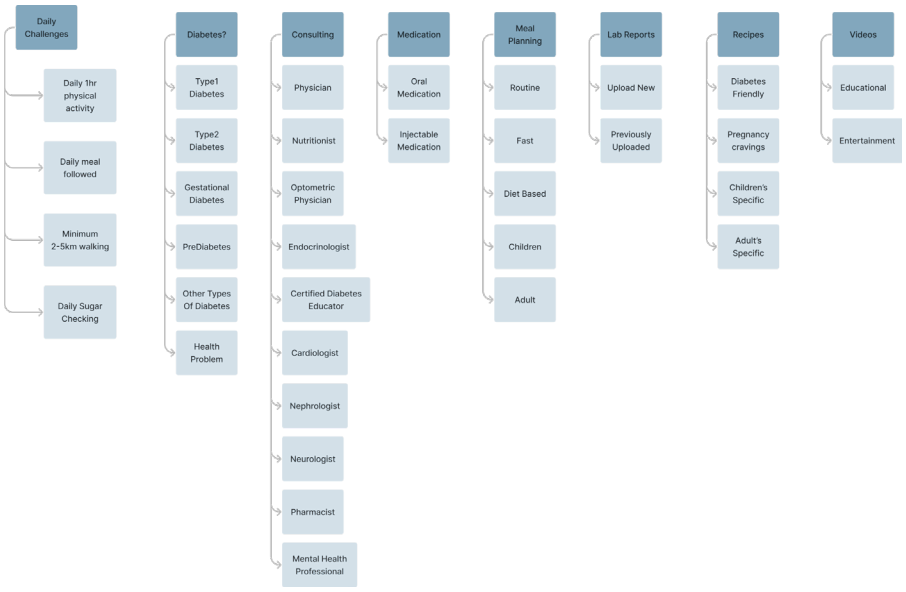


Figure 7. Card Sorting for product feature categorisation

3.3. INFORMATION ARCHITECTURE

When designing our system, we took a user-centric approach. The process began with card sorting, where users organized product features into meaningful categories. Based on their insights, we created an information architecture with seven main sections:

1) Profile: Users manage their personal information and preferences here.
2) Notification: This section handles alerts, reminders, and updates.
3) Chatbot: Users can interact with our friendly AI chatbot for assistance.
4) Prizes: Rewards and incentives are tracked in this category.
5) Daily Challenge: Engaging tasks and activities are organized here.
6) Calendar: Users can plan, and track events related to their health journey.
7) Our Services: A comprehensive overview of what we offer.

Additionally, the daily challenge and our services sections have subcategories, which you can explore further in figure 8. Our goal is to create an intuitive structure that empowers users in managing their diabetes effectively.

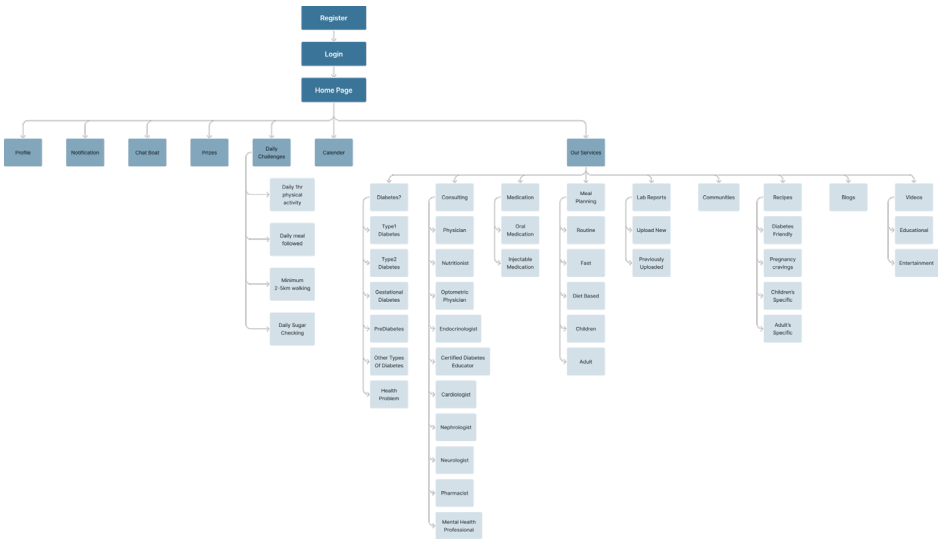


Figure 8. Information architecture of proposed system

3.4. MOBILE APPLICATION USER INTERFACE

The following figure shows the mobile user interface designed for the user centric design solution for diabetic patient.

1) Home Screen: The screen is all in one screen. It shows patient's daily progress for challenges, their status of daily exercise, Keep track of their sugar level. Also motivate them to handle the diabetes in an appropriate way by showing them motivational quotes. It also consists of all the services that help patients/user to maintain their diabetes. Menu bar includes calendar, chatbot, challenges which will help patient to keep them informed about the important dates and help them to tackle with diabetic condition in a positive way.

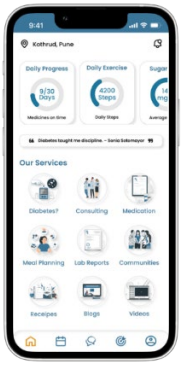


Fig. 9. Home Screen

Personalisation: These screens contain few questions that will help to personalized the users experience.

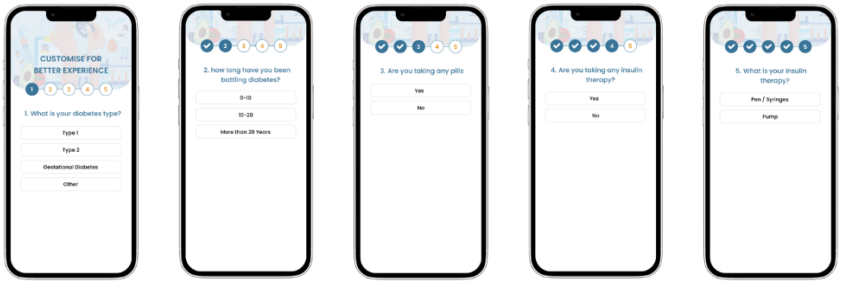


Fig. 10. Personalisation Screens

Other Features: The features in Fig. 11 will help patients and their family in better understanding the condition and caring for their diabetic issues.

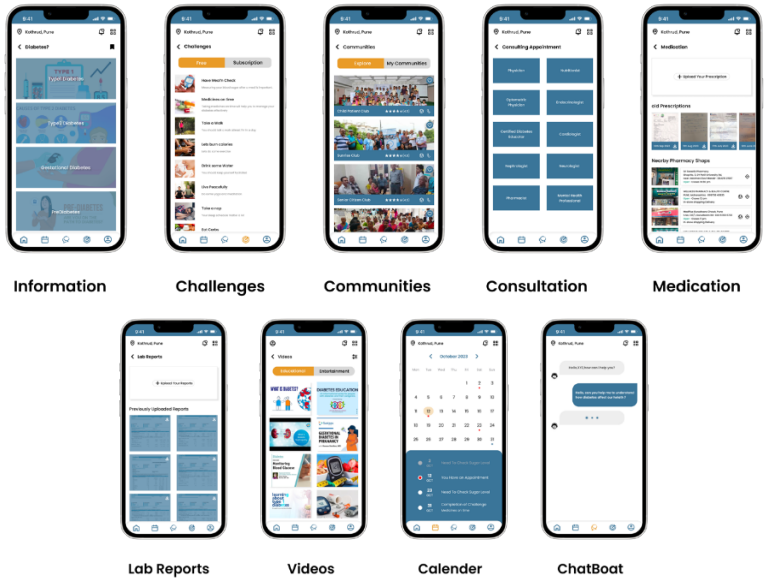


Fig. 11. Features for Diabetic Patients to Better Manage Their Condition

4. TESTING

4.1. USABILITY TESTING

6 users were recruited for the usability testing for the following tasks. We performed user task analysis.

Table 2: Book an Appointment

	User 1	User 2	User 3	User 4	User 5	User 6
Task Completion	Pass	Pass	Pass	Pass	Pass	Pass
Time Taken	30 Sec	42 Sec	10 Sec	15 Sec	45 Sec	25 Sec

Table 3: Upload Lab Reports

	User 1	User 2	User 3	User 4	User 5	User 6
Task Completion	Pass	Pass	Pass	Pass	Pass	Pass
Time Taken	42 Sec	30 Sec	20 Sec	31 Sec	40 Sec	38 Sec

Table 4: Join a Community

	User 1	User 2	User 3	User 4	User 5	User 6
Task Completion	Pass	Pass	Pass	Pass	Pass	Pass
Time Taken	14 Sec	30 Sec	30 Sec	23 Sec	54 Sec	38 Sec

Table 5: Start a Challenge

	User 1	User 2	User 3	User 4	User 5	User 6
Task Completion	Pass	Pass	Pass	Pass	Pass	Pass
Time Taken	34 Sec	43 Sec	36 Sec	29 Sec	25 Sec	49 Sec

4.2. USABILITY METRICS

- *Task 1: Book An Appointment*
  Success Score : no. of Task Completed/no. of attempts X100 = 1/6 X100 = 16.66%
  Error Rate : no. of errors/no. of attempts X100 = 0/6 X100= 0
  Task Time : Time per User/no. of Users X100 = 167/6 X100= 2,783.3%
- *Task 2: Upload Lab Reports*
  Success Score : no. of Task Completed/no. of attempts X100 = 1/6 X100 = 16.66%
  Error Rate : no. of errors/no. of attempts X100 = 0/6 X100= 0
  Task Time : Time per User/no. of Users X100 = 201/6 X100= 3,350%
- *Task 3: Join a Community*
  Success Score : no. of Task Completed/no. of attempts X100 = 1/6 X100 = 16.66%
  Error Rate : no. of errors/no. of attempts X100 = 0/6 X100= 0
  Task Time : Time per User/no. of Users X100 = 189/6 X100= 3,150%
- *Task 4: Start a Challenge*
  Success Score : no. of Task Completed/no. of attempts X100 = 1/6 X100 = 16.66%
  Error Rate : no. of errors/no. of attempts X100 = 0/6 X100= 0
  Task Time : Time per User/no. of Users X100 = 216/6 X100= 3,600%

5. CONCLUSION

As a result, this study provides insightful information on the patients with diabetes and provides a comprehensive overview of the process of managing the chronic disease. Our research shows that people with diabetes experience a range of challenges that go beyond purely physical problems, with emotional and psychological components as well. The importance of this study is that it can highlight areas where people with diabetes are currently dissatisfied with their care and demonstrate opportunities for design innovation to address these issues. Personalization, empathy, and user-centered design are essential components to improve the overall standard of living and user experience (UX) for diabetic patients. Add to this the importance of digital health solutions such as smartphone apps.

REFERENCES

Asman AG, Hoogendoorn CJ, McKee MD, Gonzalez JS. Assessing the association of depression and anxiety with symptom reporting among individuals with type 2 diabetes. J Behav Med. 2020 Feb;43(1):57-68. doi: 10.1007/s10865-019-00056-x. Epub 2019 May 20. PMID: 31111355; PMCID: PMC7313241.

Faienza MF, Pontrelli P, Brunetti G. Type 2 diabetes and bone fragility in children and adults. World J Diabetes. 2022 Nov 15;13(11):900-911. doi: 10.4239/wjd.v13.i11.900. PMID: 36437868; PMCID: PMC9693736.

Fleming GA, Petrie JR, Bergenstal RM, Holl RW, Peters AL, Heinemann L. Diabetes digital app technology: benefits, challenges, and recommendations. A consensus report by the European Association for the Study of Diabetes (EASD) and the American Diabetes Association (ADA) Diabetes Technology Working Group. Diabetologia. 2020 Feb;63(2):229-241. doi: 10.1007/s00125-019-05034-1. PMID: 31802144.

Frommer L, Kahaly GJ. Type 1 diabetes and associated autoimmune diseases. World J Diabetes. 2020 Nov 15;11(11):527-539. doi: 10.4239/wjd.v11.i11.527. PMID: 33269064; PMCID: PMC7672792.

Goyal S, Rani J, Bhat MA, Vanita V. Genetics of diabetes. World J Diabetes 2023; 14(6): 656-679 [PMID: 37383588 DOI: 10.4239/wjd.v14.i6.656]

Mohebi, R., Liu, Y., Hansen, M.K. et al. Insulin growth factor axis and cardio-renal risk in diabetic kidney disease: an analysis from the CREDENCE trial. Cardiovasc Diabetol 22, 176 (2023). https://doi.org/10.1186/s12933-023-01916-2

Monaghan, M., Bryant, B., Inverso, H. et al. Young Children with Type 1 Diabetes: Recent Advances in Behavioral Research. Curr Diab Rep 22, 247–256 (2022).

Nakhleh A, Shehadeh N. Hypoglycemia in diabetes: An update on pathophysiology, treatment, and prevention. World J Diabetes. 2021 Dec 15;12(12):2036-2049. doi: 10.4239/wjd.v12.i12.2036. PMID: 35047118; PMCID: PMC8696639.

Ogurtsova, K., Guariguata, L., Whiting, D. et al. Incorporating uncertainty measurement in the International Diabetes Federation Diabetes Atlas methodology for estimating global and national prevalence of diabetes in adults. Arch Public Health 73 (Suppl 1), P31 (2015).

Rayate AS, Nagoba BS, Mumbre SS, Mavani HB, Gavkare AM, Deshpande AS. Current scenario of traditional medicines in management of diabetic foot ulcers: A review. World J Diabetes. 2023 Jan 15;14(1):1-16. doi: 10.4239/wjd.v14.i1.1. PMID: 36684382; PMCID: PMC9850800.

Salvador, D., Bano, A., Wehrli, F. et al. Impact of type 2 diabetes on life expectancy and role of kidney disease among inpatients with heart failure in Switzerland: an ambispective cohort study. Cardiovasc Diabetol 22, 174 (2023).

Smith KJ, Pedneault M, Schmitz N. Investigation of anxiety and depression symptom co-morbidity in a community sample with type 2 diabetes: Associations with indicators of self-care. Can J Public Health. 2016 Mar 16;106(8):e496-501. doi: 10.17269/cjph.106.5170. PMID: 26986910; PMCID: PMC6972267.

Tibiriçá E, Rodrigues E, Cobas R, Gomes MB. Increased functional and structural skin capillary density in type 1 diabetes patients with vascular complications. Diabetol Metab Syndr. 2009 Dec 3;1(1):24. doi: 10.1186/1758-5996-1-24. PMID: 19958533; PMCID: PMC2794258.

Wang X, Zhao X, Lian T, Wei J, Yue W, Zhang S, Chen Q. Skin autofluorescence and the complexity of complications in patients with type 2 diabetes mellitus: a cross-sectional study. BMC Endocr Disord. 2021 Apr 1;21(1):58. doi: 10.1186/s12902-021-00725-6. PMID: 33794864; PMCID: PMC8017648.

Yücel, Ş.Ç., Güler, E.K. & Ak, İ. Investigation of sleep quality, quality of life, anxiety and depression in patients with diabetes mellitus. Int J Diabetes Dev Ctries 35, 39–46 (2015).

Gillespie, K. M.. (2006). Type 1 diabetes: pathogenesis and prevention. Canadian Medical Association Journal, 175(2), 165–170. doi:10.1503/cmaj.060244

Fletcher, Barbara; Gulanick, Meg; Lamendola, Cindy . (2002). Risk Factors for Type 2 Diabetes Mellitus. The Journal of Cardiovascular Nursing, 16(2), 17–23. doi:10.1097/00005082-200201000-00003

Michelle Lende;Asha Rijhsinghani;. (2020). Gestational Diabetes: Overview with Emphasis on Medical Management . International Journal of Environmental Research and Public Health, (), –. doi:10.3390/ijerph17249573

Unnikrishnan, Ranjit; Anjana, Ranjit Mohan; Mohan, Viswanathan . (2016). Diabetes mellitus and its complications in India. Nature Reviews Endocrinology, (), –. doi:10.1038/nrendo.2016.53

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 161–171

TEXTILE UPCYCLING FOR SUSTAINABLE FASHION: A CASE STUDY FROM NIFT SHILLONG

Rimi Das[1], Dr Meenakshi Gupta[2]

[1]Associate Professor, NIFT Shillong
[2]Associate Professor, Banasthali University

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1280

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

The Northeast region of India, renowned for its abundant cultural variety, is home to a vivid drapery of traditional textiles essential to maintaining that diversity's spirit. With their combination of generations-old indigenous designs, materials, and techniques, these textiles are a living tribute to the North East's rich cultural inheritance. The North East has been a melting pot of varied tribes for generations, creating a cultural fusion where several tribal groups speak different languages, uphold their ancient rituals, maintain independent economies, and produce one-of-a-kind crafts and fabrics. In the past, when there were no other ways to verify a person's goods and familial responsibilities, these textiles frequently functioned as identity cards. This paper will take you on a tour of the North East's elaborately woven clothing and its way of draping the rectangular unstitched textile to make it look like apparel, many of which still exist today. The clothing, which is mostly made of unstitched fabric and is worn in various elegant, opulent, innovative, and different ways, gives rise to a distinct style and greatly influences how modern women dress. This paper will stress the importance of traditional textile apparel of the North East and explore how new traditions have been created by transferring artistic ideas through upcycling the present woven textile by using a zero-waste pattern method by the students of the fashion design department for sustaining the textile and styling to suit the tastes of the adopting lifestyle. The effort provided the students with a future business opportunity, alternative sources of cheaper materials, enriched creativity, and fun. The findings showed that the students' attitudes toward the use of materials and design techniques had changed noticeably.

Keywords: North East textile craft, Sustainability, Upcycling, Zero-waste, Fashion

1. INTRODUCTION

The inhabitants of Asian countries wear different costumes than those of other nations. Countries on the same continent also have different fabrics and clothing. Each state in India has a unique traditional clothing that is unique to it. Every village in our nation's northeast has a distinctive traditional dress code that dates back to ancient times. These variations are evident in the material, colour, and pattern choices made by each group. These differences may be due to cultural influence, suitability to the climatic condition of the region, availability of raw materials and also differences in taste of design (Guite, 2010). Dresses, as well as designs, colours and motifs on textiles, not only reflect cultural identity but also symbolise the possession of rich traditional knowledge and also source of their history (Teron & Borthakur, 2012). North East India is home to 145 distinct tribes, each with its own distinctive cultural identity and traditional garb. Indigenous groups have been using traditional handlooms since ancient times.

In these costumes, design plays an important role. Design is normally created out of local needs and thus carries an identity. Individuals' labelling of themselves as members of particular groups and their design of various utility items carry their own identity. To retain the identity, specific practices followed by a community form a culture and thus retaining and changing in time makes a tradition. Geographic location-specific elements and environmental variations

influence it. Religious and ritual practices protect the values of a society (Mookerjee, 1998). Certain use of utility items and clothing becomes a part of a culture.

In this context, the possibility of combining artisan and modern fashion has drawn a lot of interest, primarily because of its potential to lead to more sustainable futures (Ferraro et al., 2011). Hur and Beverley (2013) investigated how craft may support sustainable fashion production and consumption. According to Cox and Bebbington (2015), there are goals that social sustainability and craft practice have in common. Craft might open up new markets for its goods if it helps achieve sustainable development principles, According to Jung et al. (2015), the craft is a type of production where culturally significant designs, items, and endeavours may take shape.

This paper explores how to include a locally sourced material into a zero-waste fashion design process, thereby upcycling and enhancing the garment's visual appeal without compromising the fabric's essential qualities. As Northeast with its myriad traditional costumes proves the zero waste technique and its diverse origin can be utilised by transforming or modifying through various diversification and combination with the help of new technology to get a fresh insight, which can also contribute new market value as Indian design. The work of Thenuwara (2012) in her book "Hand Woven Heritage," to nurture a particular creativity or a craft, it is vital to know about the craft and make it beneficial in the contemporary economy. Encouraging the creation of fresh knowledge and awareness in the domains of textile and fashion design is the aim of this paper

2. LITERATURE REVIEW

NORTH EAST TEXTILE CRAFT

Northeast India possesses a very rich cultural heritage, unique to its diverse application, as also seen in the cases of other parts of India, specifically, the North East region has experienced varied ethnic existence with community-specific culture, tradition, customs, rituals, etc. trade their materials to others and to cater likeness of the new customers of other cultures, a recent change in the attitude of local artisans is being observed to incorporate new ideas (Barua, 2007).

Textiles of the Northeast are not just cloth, but they tell stories about their entire communities. Every cloth represents the crafted or written stories and aesthetic traditions of their weavers. Each motif and design has its own story of origin that reflects the community's culture, tales, and history. Textiles of the Northeast reflect the unique identity of the people. Among the other expressions of cultures like wood carving, basketry, tattoos, cane craft etc., textiles have carved out a special niche, with each community becoming identifiable through its distinctive weaving techniques, sarongs (wraparound) decorated with different motifs, colours, or designed patterns (Verman, 2022) This distinctiveness plays a significant role in constructing identity and marking cultural variations within tribal communities. All motifs are more than just decorative items but have an independent cultural value, with each piece of cloth serving more functions than just clothing persons or families. According to Sirawung Raiping, the diverse ethnic culture and traditions of the Northeast are gradually responding to globalization in present times, with weavers and weaving societies customizing their products.

SUSTAINABILITY IN FASHION

According to Simonetta Carbonaro (Swedish School of Textile, Boras), sustainable fashion can be described as a balance of three main factors: economic sustainability, social sustainability, and environmental sustainability. Their imbalance is caused by the lack of awareness about these issues in our culture (Black, 2013). Different approaches to the production of sustainable textiles are developing internationally. Cultural studies theorist Susan B. Keiser describes fashion as a social process of negotiation and navigation of what is to come. People combine various elements for their style not only to present who they are at the moment but more accurately, who they are becoming. This process of identity creation and transformation is a collective one and, therefore depends on social circumstances. Since the 1990s two approaches to sustainable production of clothing have been developing: Eco-efficiency and Eco-sufficiency. The first one is an aspiration to produce more products from less material, while the second method lies in developing various services and getting more benefits from fewer goods.(Niinimmaki, 2011) . Sustainability as a self-sustaining system based on ecological balance. Such a system does not take more from the environment than it gives back. In the fashion industry, this idea is reflected in production processes which do not pollute the environment and do not deplete non-renewable planetary and human sources(Brown,2010)

UPCYCLING IN FASHION

Upcycling is a growing trend in fashion, especially for young emerging designers. Unlike recycling, upcycling does not require specific technologies or investment for the transformation process. The main feature of this method is almost always an obvious presentation of a source of material, its previous outlook, and its function. So, as a method, it is used not only in the creation of unique pieces but also as a promotion of more conscious consumption of fashion and as 'eco-fashion'. Margaryta Zubrii in 2019 in her study mentioned that two main kinds of upcycled fashion must be defined. The first one lies in the use of previously unused materials - leftovers from other clothing or textile production. The other way is to work with already-used materials. It can be not only clothing but also printed advertisement banners, military textiles (such as parachutes), furniture leather, etc. Designer like Christopher Raeburn a British brand established in 2010 and based in London, is a great example of a sustainable and successful company, which combines different transformative methods, using recycled materials together with the upcycling method, promoting sustainability and responsible consumption of fashion.

The upcycling method deals with both pre-consumer and post-consumer waste. The main task for a designer is to create aesthetically and ethically pleasant, durable garments while working with this method.

ZERO-WASTE IN FASHION

Zero-waste was developed by Claire McCardell and Bernado Rudofsky (the 1950s), Zandra Rhodes (the 1970s) and Yeohlee Teng (the 1980s). Today zero waste is an inseparable part of sustainable fashion design due to the work of Holly McQuillan, who is a pioneer of contemporary zero-waste pattern making. Holly started to develop this approach soon after her MA project in 2004. During this time she developed a few methods for zero waste design, curated several group exhibitions and published a book *Zero Waste Fashion Design*[41] co-authored with Timo Rissanen. Zero-waste fashion design, according to McQuillan (2011), "is a design approach that takes into account unpredictability in the process of handling materials and environmental instability with respect

Zero waste is an interesting rapidly developing approach in fashion which has its advantages and disadvantages. Zero waste fashion designers must be knowledgeable on pattern making to create wearable, qualitative garments and should be able to work on long-term projects not seeking to match current trends. Also, it is best suitable for small-scale production or even individual orders, as creating a pattern, a designer should already know the fabric which will be used and build the pattern from a given material.

The textiles in the Northeast have the potential to significantly contribute to the growth of the local economy, ethical commerce, and sustainable communities. This study uses a zero-waste design to upcycle the abandoned handloom fabrics from Tripura, in Northeast India, to demonstrate an environmentally and morally conscientious manufacturing strategy.

3. OBJECTIVE OF THE STUDY

1. Explore the **intersection between sustainability, fashion, and traditional textiles**
2. Investigate the potential of **zero-waste fashion design** as a sustainable approach to garment production
3. Examine the **utilization of discarded traditional textiles**, from Tripura, for upcycling into zero-waste apparel
4. Analyze the **challenges and opportunities associated with zero-waste** pattern-making and garment construction in the context of sustainable fashion
5. Identify strategies for **fostering collaboration between fashion designers and artisans** to promote ethical craftsmanship and sustainable fashion practices

4. METHODOLOGY

This paper features the design exploration of the existing discarded woven wraparounds by upcycling into zero-waste pattern apparel undertaken by five fashion design students of the National Institute of Fashion Technology, Shillong as a part of their design curriculum under the craft cluster development initiative. These explorations are guided design innovation initiatives under the mentorship of the author. This explorative study is based on a collaborative approach with the weavers at the Sonam Mahila Tant Silpa Samabaya Samiti which is the co-operative society located in the Shankhala cluster in West Tripura of North East India. The project of craft design was pursued as a classroom exercise and hence was limited in time duration. The duration of the project was between Sept-Nov 2019, hence the study had the following limitations:

- Explorations concerning fabrics were limited to the wraparound available at the society

- As there were only 5 students in the group who wanted to do this project only 5 upcycled apparel were designed from the existing wraparounds for upcycling
- The project was executed as a classroom project and the apparel designed and developed were presented for evaluation by the jury, quantitative feedback could not be taken

5. TEXTILES OF NORTHEAST

Weaving is a traditional occupation for a broad range of social groups in the Northeast consisting of the eight states is a veritable salad bowl of communities consisting of Assam, Arunachal, Nagaland, Manipur, Mizoram, Tripura, Meghalaya and Sikkim. The looms used in the Northeast states are fly shuttle looms and throw shuttle looms, but loin looms, are different from other loom types used in the rest of India and especially prevalent in mountain areas. Every weaving motion is done by hand, and there is no pedal for the shedding motion. The loin loom is a simple device, although products woven on it vary in textures, hues, and designs, and the weavers mostly use acrylic and cotton yarn. One of the uniqueness of the wraparound of the Northeast plays a significant role in constructing identity and marking cultural variations within tribal communities. All motifs are more than just decorative items but have an independent cultural value, with each piece of cloth serving more functions than just clothing persons or families.
The below textile traditions of some communities are cited for their community-specific character differences for reference.

Assam: The Boro's who are the aboriginal people of Assam wear a single-piece attire which is known as 'Dakhana' and has a yellow-green colour body with some designs in red and brown colour made of hand-spun yarn. These are mostly made in the country looms.

Fig 1: Attire of Bodo Dakhana (Photography: self)

Arunachal Pradesh: Adi females wear a wraparound which is known as a 'gale' and it mostly concentrates on simple straight lines as designs which are mostly woven in the loin loom with colours like black, yellow, dark blue, green, scarlet and madder.

Fig 2: Gale Attire of Adi group (Photography:self)

Nagaland: The Naga women's skirt is impossible to describe as all the varieties of skirts vary from village to village, clan to clan in the same village and even family to family. The skirt includes red and black stripes with a little yellow in the black stripes, red, black and white stripes and is mostly made in loin loom.

Fig 3: Attire of Nagaland with different wraparound. (photography: NIFT Shillong students)

Manipur: Traditionally Manipuri women use floral and striped design wrap-around skirts known as 'Phanek'. They are handwoven on loin loom using cotton, silk and other synthetic yarns. Blue, green, orange and red are the common shades used for the design.

Fig 4: Manipuri Phanek (Source:internet – 5 dress of Manipur)

Mizoram: Mizoram produce 'Puans' in numerous designs on traditional loin looms. These are lungis worn by women are their native dress with beautiful design and intricate embroidery, which is invariably worked out along with the weave.

Fig 5: Mizo Puan (Photography: self)

Meghalaya: The Garo women wear a wrap-around which is called 'Dakmanda' which are made in the fly shuttle loom with beautiful flower motifs with cotton and acrylic yarn with vibrant colours.

Fig 6: Garo Dakmanda (photography: DRC WSC Guwahati)

Tripura: The woman of Tripura wears a large piece of cloth wrapped around their lower part which is known as 'Rinai' which is fastened around the waist and falls to the knee.

Fig 7: Lower wrap around Rinai and upper cloth risha (photography- NIFT Shillong students))

6. MOTIVATION OF CREATION

Traditional attire is the only distinctly visible element with various colour combinations with motifs, which may be considered one of the very strong design components that prevailed in the Northeast The wrap-around of the Northeast itself makes a beautiful attire but the people outside the Northeast do not know about the beauty. So, the cluster taken for the study is the Sonam MahilaTant Silpa Samabaya Samiti of the Shankhala cluster in the West Tripura where there are 462 registered weavers under the cooperative society. The weavers are provided with a training programme for the production of diversified products. Traditionally the weavers are skilled to produce traditional fabrics in loin looms as well as throw shuttle looms and fly shuttle looms. The major products of the cluster are cotton and acrylic.

In this paper, the zero-waste approach is done by one group of fashion design students who made 5 apparel out of rectangular pieces of fabric i. e wrap around. Here the design approach used is to create new garments from discarded or surplus goods. The exciting possibilities and uniqueness of Tripura's textiles are paired with this zero-waste method of clothing fabrication. The student's special zero-waste design technique maximises the handwoven fabric's potential. This approach to fashion design treats textiles, the foundational material of apparel, with attention.

Fig 8: Textile of Tripura (photography: NIFT Shillong student))

7. ANALYSIS

In the process of designing zero-waste apparel, designers should take into account certain factors, according to Rissanen and Mcquillan (2016). These factors include:

- The type of clothing and its fundamental influences will affect how designers apply the zero-waste method, changing the fundamental garment's visual aspect.
- The breadth and length of the fabric will determine the designer's or pattern maker's strategy for applying the zero-waste principle to a specific type of clothing.
- The designer or pattern maker needs to understand the characteristics of the fabric and how they will impact the final appearance of the garment.
- It's crucial to consider what to apply and how to apply particular features or components to a garment.
- When attempting to support the zero-waste principle, closing details and other supporting aspects will need to be carefully considered.

Keeping in view the above points the students explored 50 zero-waste designs on paper and keeping in consideration to eliminate all fabric waste, either through the use of patterns made from whole Rinai, interlocking pattern pieces or multiple sizes. Later they decided to keep one size and explore with fabric width by giving a closure detail on each apparel. The analysis of five separate zero-waste patterns identified the following three essential issues.

1. The patterns sometimes only work for one garment size
2. The patterns only work for the intended textile width
3. The pattern pieces are sometimes off-grain
4. Need to use both draping and block methods together on some garment

The outcome taught the students that zero-waste depends on the method of the patterns and design of apparel. The knowledge and experiences of the student and pattern can reduce the waste of fabric according to the design and style, and creative design for sustainability may reduce the waste of fabric.

8. DISCUSSIONS

Soon, being sustainable won't be an option—it will be required. Incorporating sustainable and ethical concepts into the development of textile handloom items will help raise awareness in both local and global markets, particularly as the demand for ethical and sustainable products grows. Raising the level of living in rural areas and satisfying the demand of ethical and environmentally conscious consumers for fashion items requires upcycling through the zero-waste

concept as it will use all the discarded or waste fabrics. There is a definite potential for this practice to establish a new direction in environmentally and socially responsible textile and fashion products.

The focus of this study is the zero-waste fashion design method through upcycling. Zero-waste fashion design in this paper refers to the activities and design processes that lead to such garments. In this zero-waste approach, fashion design students must have a good knowledge and understanding of garment construction methods. To create a novel design, this technique of design sought to bring together traditional crafts with textile upcycling for its objective of structuring materials and apparel.

The fashion design students used design intervention to produce a line that honoured the Tripura handloom Rinai by keeping the piece of the textile. They also transformed the product by incorporating simplistic silhouettes and designs by following the latest trends. As a size 12 woman is believed to be a standard size, it was taken in for measurements on this occasion.

Fig 10: Sketches of the zero-waste garments made out of Rinai

Fig 11: 5 choosen Zero-waste garments made of Rinai wrap around (Photo: NIFT Shillong students)

The above designs show that apparel could be engineered to use the full width of fabric, creating little waste.
Concerns for fabric waste must be managed with requirements for garment fit, appearance and value when creating or producing a zero-waste garment. Most of the challenges encountered in this project arose from trying to achieve this balance, as it would have been relatively easy to build a zero-waste apparel

9. CONCLUSION

The work of this paper may be considered as a case study covering the whole Northeast part of India where a mixed cultural prevalence with old tradition as well as contemporary need-based craft and designs are seen. This study tries to understand the items mostly seen and used that can represent identifying various specific design characters. The tribes of the Northeast were not aware of the format aspect of design making because their designs had evolved from various needs and daily requirements with locally available materials.
The findings demonstrated that the Rinai was employed in a way that was both functional and aesthetically pleasing, without detracting from its inherent value. Additionally, zero-waste design experiments necessitate that designers think beyond the boundaries of fashion design, incorporating the skills of pattern-making and textile design (Senanayake & Gunasekara: 2020). The author inputs zero-waste pattern development into the fashion design curriculum and encourages students to come up with new ideas for artisans that involve fusing traditional textiles and design. This research encourages students to incorporate traditional textiles in their design projects. Thus, when local crafts set out to attract new-age consumers, the blending of tradition and modernity becomes apparent.

10. LIMITATIONS AND FUTURE STUDIES

We speak of globalisation and open trade. The easy availability of foreign utility items has flooded the local market. Conscious efforts are on to preserve and promote the local produce for the local domestic market as well as to get international market. Producers should carry the identity of the areas of their origin not only for the trade but also to preserve the pride of originality. Rapidly growing urban awareness makes an individual accommodate significant other realities and at the same time wish to preserve traditional practices. At a time when the global market is reverting to tradition, this region has continued with its traditional techniques both with the manufacturing and dyeing of textiles. Experimentation, blended clothing, new designs are helping this textile heritage to remain relevant and still much in fashion.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

The author would like to show her gratitude to the artisans of Sonam Mahila Tant Silpa Samabaya located in the Shankhala cluster of West Tripura for sharing their pearls of wisdom during this project. The author is especially grateful to Smti. Joyshree Dutta guided the students in their understanding of the fabrics with an experience of 16 years in weaving. Special thanks go to Assistant Director S.C. Debbarman, DHHS, Agartala for guiding and arranging all the workshops in the DHHS office and doing an open house. Also grateful to Ms. Pardita, Managing Director and all the employees at the society office for mediating between the students and the weavers. Special thanks go to Mr. Prasenjit Das from DHHS, Agartala for guiding the students and arranging a workshop on weaving for the students. The author is also immensely grateful towards her supervisor Dr. Meenakshi Gupta, Assoc. Prof, Banasthali Vidyapith initiated and guided me to write this paper. Last but not least the students of the Department of Fashion Design, NIFT Shillong 7th semester who participated in this project and tried their level best to apply and learn the zero-waste pattern method by upcycling the Rinai wrap-around of Tripura into apparel to sustain the craft for the future.

REFERENCES

Barua, Utpal. (2007), A study on design elements in craft practices with special references to textile and basketry of northeast India, IIT Guwahati.
Black, Sandy. (2013. The Sustainable Fashion Handbook, London: Thames & Hudson; 1edition, 352 pages, ISBN-13: 9780500290569;
Brown, Sass. (2010) Eco Fashion, London: Laurence King Publishing; 1st edition, p.14;
Brown, Sass. (2013). Refashioned : Cutting-Edge Clothing From Upcycled Materials,

London : Laurence King Publishing, 34 p., ISBN-13: 9781780673011;
Cox, E., & Bebbington, J. (2015). Craft and sustainable development: an investigation. https://www.st-andrews.ac.uk/media/sasi/documents/
Craft%20and%20Sustainable%20Development. . Accessed 20 March 2024
Ferraro, E., White, R., Cox, E., Bebbington, J., & Wilson, S. (2011). Craft and sustainable
development: reflections on Scottish craft and pathways to sustainability. Craft + Design Enquiry, 3,1–26.
Guite, V. (2010). Tribal Folk Costumes and Crafts:A study of Zomis. Delhi: Akansha Publishing House.
Hur, E. S., & Beverley, K. J. (2013) The role of craft in a co-design system for sustainable
fashion. Making Futures. http://eprints.whiterose.ac.uk/81260/. Accessed 25 March 2024.
Jung, J., Stuart, W., Evans, M., Cassidy, T., & Twigger, A. (2015). Design roots and Creative
Ecology, in Making Futuring Conference Procceding, Plymouth University 24-25
September, Plymouth, UK, Plymouth College of Art. http://makingfutures.plymouthart.ac.uk/
Mookerjee, Ajit. (1998). Ritual Art of India, Timeless Books, New Delhi.
Niinimmaki, Kirsi, (2011). From Disposable to Sustainable: The Complex Interplay between
Design and Consumption of Textile and Clothing, Helsinki : Aalto University, 294 pages, ISBN: 9789526042848;
Pachua, Lisa Lalmuankim , Matur, Ritu and Kapoor, Kiran (2015) Traditional textiles and
costume of the mieos lusei and lai tribes, university of Delhi, http://hdl.handle.net/10603/378971
Pradhan, Dr. Ashis , K. (2019) "Innovation of Traditional Textile Art and Crafts in North
East- India" Published in International Journal of Trend in Scientific Research and
Development (ijtsrd), ISSN: 2456- 6470, Vol-3 | Issue-4, , pp.1193-1197, URL: https://www.ijtsrd.c om/papers/ijtsrd25100.pdf
Rinassen, Timo, Mcquillan, Holly, (2016). Zero Waste Fashion Design, New York: Bloomsbury, 224 pages, ISBN: 9781472581983
Sharma, G. and Karolia. Dr Anjali, (2018). Unraveling the woven treasure of Northeast of India: A sustainable approach, Sustainable Apparel, Vol:04-06, Pg 08-15
Teron, R., & Borthakur, S. K. (2012). Biological motifs and designs on traditional costumes among Karbis of Assam. Indian Journal of Traditional Textiles, 305-308.
Thenuwara, C. (2012). Hand woven heritage. Colombo: Department of National Museum. Retrieved from https://www.seamwork.com/issues/2016/05/zero-waste-design
The Ultimate Guide to Sustainable Fashion in India | The Shooting Star. (2021). Retrieved 20 Mar 2024, https://the-shooting-star.com/sustainable-fashion-india- guide/
Verman, Sanghamitra Rai (2022) Tribal Textiles of Northeast India: A Survey of Folk and
Natural Elements Nidān Volume 7, Issue 2. December 2022, pp. 1-16 Research Article ISSN 2414-8636 ,doi.org/10.36886/nidan.
Zubrii, Margaryta, (2019). Transformations of design processes and their implementation in a sustainable fashion context
Christopher Raeburn official website, Link: https://www.christopherraeburn.co.uk/explore/about

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 178–196

EFFECT OF HARDNESS OF WATER ON TEXTILE WET PROCESSING

Sonal Chaudhary[1], Dr. Shalini Juneja[2], Ekta Jain[3]

[1]Research Scholar, Department of Design, Banasthali Vidyapith, Rajasthan
[2]Associate Professor, Department of Clothing and Textile, Banasthali Vidyapith, Rajasthan
[3]M. Sc (Clothing and Textile), Banasthali Vidyapith, Rajasthan 304022

Corresponding Author
Sonal Chaudhary

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1285

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

Water is used significantly in the textile industry's various processing operations. The success of textile wet processing strongly depends on a consistent and clean supply of good-quality water. Hence, it is imperative to bestow the greatest attention towards the quality of water. Any problem in textile processing is usually associated with the water used. It is therefore essential to first test the sample of water to obviate any difficulties that the textile processing unit may face. Usually, water is considered to be unsuitable for textile processing if it contains more than 250ppm parts of hardness. Hardness in water causes wastage of dyes, chemicals and soaps, dullness of shades, uneven and patchy shades in dyeing and printing, poor fastness in shade in processed fabric, corrosion of the boiler and vessels. Keeping this in mind, the present work was carried in textile chemistry laboratory of Banasthali Vidyapith. The main objective was to see the effect of hardness of water on wet textile processing. The procedure adopted was divided into three phases. In first phase, fabric and raw materials were collected and water was prepared in textile chemistry laboratory by the researcher herself. The second phase included procedure adopted for carrying out wet textile processing (desizing, scouring, bleaching, and dyeing) with three different water samples (hard, moderately hard and soft). In the last phase, the treated samples were analyzed on the basis of percentage weight loss, whiteness index and color fastness test, percentage dye absorption and wettability test etc. It was observed that weight loss after desizing process (enzymatic desizing) was found to be more with soft water as compared to the hard and moderately hard water. In the scouring process, it was found that with moderately hard water, weight loss percentage was more as compared to soft and hard water. In the bleaching process, it was found that sample was more white when treated with moderately hard water compared to hard and soft water. In dyeing process, it was found that intensity of shades in sample treated with moderately hard water was more as compared to hard and soft water. It can also be said that some degree of hardness is required for textile wet processing.

Keywords: Water Hardness, Wet processing, Dye absorption, Whiteness Index

1. INTRODUCTION

Water is the most important constituent of life. A person can live for a few weeks without food but only a few days without water. It is an integral part of animal and vegetable tissue. All life on earth uses water as a basic medium of metabolic functioning. Water is required for agriculture, hygienic home and human waste disposal, drinking, cooking, bathing, and washing (cleaning). It helps in removing the dirt and is an excellent solvent. It is needed for the production of such a wide variety of materials as steel and other metals, paper, textiles, beverages, daily products, petroleum and coal, rubber and plastics **(**Kaur, 1997).

In the wet processing industry, water is an essential necessity for the treatment of textile materials. The usage of textile materials has expanded significantly as a result of rising living standards, which in turn has raised demand for water and the need for textile production (Gopalkrishan, 2019). The textile industry uses a lot of water, which strains the world's water supply. The textile wet processing industry's enormous water consumption, huge waste water output, and

significant pollution potential are causes for increasing concern (Gomes *et al*., 2000). Water is used extensively in the textile industry for a variety of wet processing procedures, including desizing, washing, scouring, bleaching, and dyeing. A clean, reliable supply of high-quality water is essential for the successful wet processing of textiles, and the quality of the processing water varies considerably between places and factories based on the water source and water treatment facilities. Use of untreated water in the process has hidden cost. The quality of water consumed depends to its source and season (Manezes, 2004).

Three types of water are used in textile wet processing factories: wastewater produced during the treatment process, raw water taken from subterranean sources, and processed water that has had its hardness removed. Soft water is utilised in treatment processes like dyeing and finishing as well as in the boiler to generate steam. Part of this soft water is also utilised for lab work, pilot processing, dyehouse cleaning, and other purposes. A loss of resources and economic results when factories use all of the water for soft water. Since the remainder is typically used for other household needs, the ratio of groundwater to soft water is typically greater than 70% (N.C., 2009).

Because water quality affects soils, crops, and the environment, it is crucial for human health as well as the amount and quality of grain crops (Kimbrough,1996; Hoek *et al*., 2001). A few uses of water include domestic use, mining, forestry operations, industrial, agricultural, and power generating (Khatri *et al*., 2014). One of the essential raw materials for all wet textile processes is water. The majority of textile processors pay little attention to the quality of the water, despite their best efforts to inspect the quality of every other raw material. Since water is used in processing units in far larger quantities than any other chemical, any deterioration in water quality will inevitably have an impact on processing. As such, it is essential that the water's quality should be given careful consideration. In the textile processing industry, the water's pre-processing treatment and conditioning are crucial. Richer the fabric's finish, the better the water quality (Smith, 1987).

The presence of contaminants in the water supply affects different textile wet processes in different ways. Consideration should be given to a number of primary types of water consumption, such as processing, potable, utility, and laboratory applications. In many cases, laboratory water must meet specific standards, which are typically satisfied by additional water purification within the laboratory. Chlorinating potable water can change the colour of dyes or have other negative impacts on processing. Poor lab-to-dye house coloration for dye formulations or other coloration issues might occasionally be caused by this. Hardness is one type of impurity that can lead to issues with boiler water or water used for humidification in production areas, which includes knitting, spinning, weaving, and inspecting regions. water hardness in systems that use direct atomization humidification (Smith, 1987).

The biological, chemical, and physical properties of the water were compared to a set of standards to determine the quality of the water. This makes it possible to assess if the water is suitable for consumption or use in the environment. When water comes into contact with dirt, rocks, or the earth, it gathers pollutants from these surfaces. When sewage or industrial wastes come into contact with water, the water gets contaminated. Remains of plants and animals decompose and introduce organic pollutants into water. Rainwater draws gases from the atmosphere, such as carbon dioxide, oxygen, and others (Krishnamurthy, 2001).

Hard water is defined as having a high concentration of ions such as calcium and magnesium. However, other dissolved metals can also create hardness in the form of divalent or multivalent cations, including manganese, iron, zinc, barium and aluminium (Sengupta, 2013). Since the removal method varies, the two types of hardness must usually be distinguished from one another. Water is classified as soft, hard, or very hard based on the amount of calcium and magnesium present, which can induce both temporary and permanent hardness. Technically speaking, several distinct water hardness scales (such as very soft, moderate, medium hard, hard, and very hard) were suggested (Kumari et al., 2016).

The presence of salt of calcium and magnesium ions in water are responsible for hardness of water and lead to the formation of insoluble precipitates with soap. Other metal solution such as iron may also contribute to hardness but they are present in small amounts as compared to calcium and magnesium. Calcium and magnesium compounds are commonly present as sulphates and chlorides are the cause of permanent hardness. Hard water is harmful both in the manufacturing and finishing processing of textile fiber, yarn, fabric and garment (Krishnamurthy, 2001).

The conventional method used to determine hardness is chemical titration. The hardness of a water sample is measured in parts per million, or ppm, and is represented in milligrammes per litre of calcium carbonate, or mg/l CaCO3. (Wurts *et al*., 1993).

Parts per million (ppm) is the common unit used for hardness of water. It is defined as the number of parts by weight of $CaCO_3$, present in million parts by weight of water. Hard water is not good for cleaning, bathing, drinking, or other

household uses. Soluble soaps become insoluble precipitates when they come into contact with the ions responsible for hardness. As a result, soap is wasted during bathing and washing.

Hard water is harmful for a lot of businesses, including paper, sugar, and textiles. The following characteristics are impacted by dissolved salts such as Ca, Mg, Fe, and Mn: giving paper in the paper industry a glossy, smooth surface producing a rich lather in the laundry. Because hard water leads scales to form on inner plates, it is also unsuitable for creating steam in boilers. Hard water can also lead to other issues such as corrosion, foaming, and priming. Due to the hardness-producing ions interaction with different reactions, hard water is unsuitable for laboratory analysis **(Krishnamurthy, 2001).** Medium and large-scale processing houses can very well get installed a water treatment plant for softening the water by the ion-exchange process.

The present study has been taken to study the effect of hard, moderately hard and soft water on different textile processing (desizing, scouring, bleaching and dyeing). The work will be useful academically and industrially also. In textile industry, water consumption is far greater than amounts of fibres processed specially in wet processing treatments. Rinsing, washing operations consume enormous amount of water. Hard water creates many problems from desizing to finishing in textile industry. Hardness in wet processing leads to numerous other unfavourable consequences. Every fibre has a specific textile colour that is intended to be less soluble in hard water. Inadequate solubility causes the dye to become weaker and may even result in dyeing defects. The most important parameter to determine before dyeing for the presence of metal content is the hardness of the dye house water. It has more of an effect on human health as well. The work's outcomes will help future projections on the deterioration of water quality in the years to come, as well as how it will affect dyeing behaviours and the sustainability of the present dyeing method in light of the water's continuous deterioration.

Keeping above points in mind the present work has been under taken with the following objectives:

2. OBJECTIVES

1. To determine hardness of collected water sample.
2. To prepare different water samples of hard, moderately hard and soft water.
3. To carry out wet processing (desizing, scouring, bleaching and dyeing) on grey cotton fabric with different water samples.
4. To study the effect of hardness of water on textile processing.

DELIMITATIONS

1. The study was de-limited to cotton fabric only.
2. The study was de-limited to water samples that is soft, moderately hard and soft.
3. The study was de-limited to desizing, scouring, bleaching and dyeing.

RELATED STUDIES:

(i) Gupta (1998) The study was done with the objective to bleach the grey cotton fabric with H_2O, and NaOCI bleach on different pH, temperature, time and study on effect of dye evenness and physical properties of bleached fabric. They concluded that H_20, gave better white. Also, after bleaching stiffness, thickness were decreased and there was increase in crease recovery and wettability of fabric.

(ii) Kaur (1997) studied on "Effect of water hardness on dyeing and laundering of cotton fabric". The objective was comparison of percentage soil removal of washed soil samples and eveness of dye with hard and soft water. They concluded soil cleaning and eveness of dye efficiency was more when treated with soft water samples compared to hard water.

(iii) Bajpai (2001) The study was done to see the effect of different desizing methods on comfort and physical properties of Khadi with the objective to find a efficient method. Efficiency of desizing method was assessed by the weight loss percentage and amount of size removed. They concluded crease recovery and bending length and softness of fabric was decreased and tensile strength was increased.

(iv) Chaptwala et al. (1994) Study of "Effect of water hardness and total dissolved solids on dyeing of polyester and cationic dyeable polyester". Water sample with hardness range from 780 pm to 7200 ppm were collected from different units and for water softening using metaclaw -CL. They concluded the adverse effect of hardness of water on the results of dyeing, there is no need to soften the hard water by adding large quantity of metaclaw-CL.

(v) Shinde *et al*, (2015) did a study on the impact of water hardness, specifically the presence of calcium, magnesium, and iron, on the dyeing process of cotton with reactive dyes. The work experimented with various water hardness levels ranging from 20ppm to 2000ppm. The findings suggest that increasing water hardness negatively affects dyeing, leading

to decreased fabric strength across all studied shades. It was found that the impact of water hardness varies with the type of reactive dye used, indicating the need for soft water or the addition of sequestering agents to optimize dyeing results. Overall, the study underscores the significance of water quality management in textile dyeing processes and emphasizes the necessity of tailored approaches to mitigate adverse effects of water hardness.

(iv) Chougule, (2020) did a study on "An experimental study of effect of water quality on cotton". The work highlights the critical importance of water quality in textile processing, emphasizing how these requirements must be met to ensure smooth operations. It discusses the significant variations in water usage among textile mills due to factors such as fabric types, processes, and water sources, with high water costs being a concern for many operations. The study focuses on experimental investigations into the effects of different water types on textile wet processing, aiming to understand and optimize water usage in the industry. After the dyeing process, processed cotton fabric was tested for K/s value using 2% reactive dye (Procion blue MG MR dye was used), washing fastness (AATCC), washing fastness (ISO-105), rubbing fastness (AATCC Wet), rubbing fastness (ISO-105 Dry), and rubbing fastness (ISO-105 Wet) was assessed. These tap water values were found to be more acceptable. These values were not at all satisfactory for bore-well water. Blended water performs at its best, making the usage of the blend system cost-effective.

(vii) Burkner *et al*., (1970) found no significant differences between water samples collected in the fall, winter, and spring seasons. However, water analyses revealed that softening equipment in several cases did not achieve the expected level of water softness. Additionally, the water supplies in the area were found to contain elevated levels of iron and manganese, exceeding thresholds known to cause staining during laundering. Consequently, the study recommended avoiding the use of chlorine bleach when iron and manganese are present in the water. White fabrics laundered in hard water with high iron and manganese content showed initial discoloration, which worsened with repeated washings. Moreover, for fabrics laundered in very hard water, tensile strength tended to decrease in the lengthwise direction. These findings underscore the importance of water quality management in textile processing, highlighting the need for effective softening methods and caution when dealing with water containing iron and manganese.

3. METHODOLOGY

The methodological approach followed was as follows:

3.1 Material Used
3.1.1 Fabric
3.1.2 Chemical
3.1.3 Water
3.1.4 Instruments
3.2 Determination of Preliminary Data of the Fabric
3.2.1 Thread Count
3.2.2 Thickness of the fabric
3.2.3 Weight per unit area
3.3 Determination of Water Hardness
3.3.1 Determination of Total hardness
3.3.2 Determination of Calcium hardness
3.3.3 Determination of Magnesium hardness
3.3.4 Estimation of Permanent hardness
3.3.5 Estimation of Temporary hardness
3.4 Wet Processing of Fabric
3.4.1 Desizing (Enzymatic)
3.4.2 Scouring
3.4.3 Bleaching
3.4.4 Dyeing Direct dye, Cold reactive dye)
3.5 Analysis of the Treated Samples
3.5.1 Weight loss percentage
3.5.2 Whiteness index
3.5.3 Wettability Test
3.5.4 Intensity of shade of the samples
3.5.5 Optical Densiy

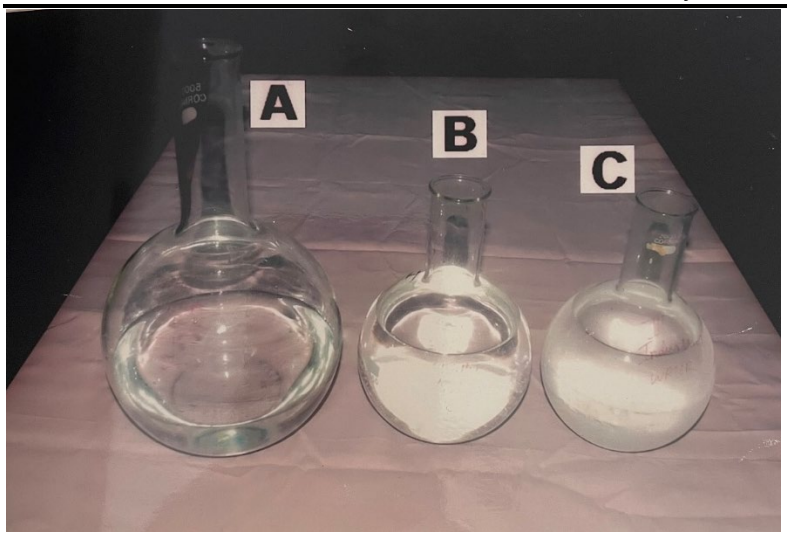


Fig.1 Water Samples (A: Soft Water, B: Moderately Hard Water, C: Hard Water)

3.1 MATERIAL USED -

3.1.1 Fabric - Pure 100 % grey cotton fabric was purchased from Jaipur.

3.1.2 Chemicals Used - EDTA, Erichrome Black-T, Murexide indicator, malt disatase, HSO_4, H_2O_2, NaOCI, Caustic Soda, direct dye, reactive dye.

3.1.3 Water - Tap water taken from "Textile Chemical Laboratory of Banasthali Vidyapith ".

3.1.4 Instruments – Pick glass, Thickness gauge, Spectrophotometer

3.2 DETERMINATION OF PRELIMINARY DATA OF THE FABRIC

3.2.1 Thread Count – Thread Count was determined by pick glass. The grey cotton fabric was spread on the table. Five square samples of size I" x I" were marked. The count of threads warp wise and weft wise with in these squares was determined. The average of these five readings were calculated.

3.2.2 Thickness of the Fabric - Thickness of the fabric was determined by using prolific Shirley thickness gauge.

3.2.3 Weight per Unit Area- Five specimen of 5 cm x 5cm were cut randomly from the fabric. Every sample was weighed on analytical balance.

3.3 DETERMINATION OF WATER HARDNESS

(a) Preparation of Buffer Solution (pH=10)- Dilute 142 ml of concentrated ammonia solution (sp. gr. 0.88-0.99) and 17.5 gm of A.R. quality ammonia chloride to approximately 250 ml with distilled water.

(b) Ericrome Black -T indicator – Mix 0.5 gm dye with 100 gm NaCl to prepare dry powder dissolve 0.2g of the solid indicator in a solution containing 15 ml of tri ethanolamine and 5 ml of absolute ethyl alcohol.

(c) Murexide Indicator – Prepare a ground mixture of 200 gm murexide with 100gm of solid NaCl.

(d) Sodium hydroxide buffer solution – Dissolve 80 gm NaOH and dilute it to 1000 ml.

(e) Standard EDTA solution 0.01 M (M/100)- For preparing M/100 solution of EDTA dissolve 3.723 gm EDTA Sodium Salt in distilled water and dilute it 1000 ml. Standardize against standard Calcium solution. (1 ml=1mg $CaCO_3$).

3.3.1 Estimation of Total Hardness –

Take 210 ml of water sample in conical flask before shaking it properly. Add 1-2 ml of Ammonium buffer solution. Add 1 drop of Ericrome black-T and titrate with standard EDTA (0.01M) till wine red colour change to blue. Note down the burette reading. Total hardness was calculated.

Estimation of Total Hardness

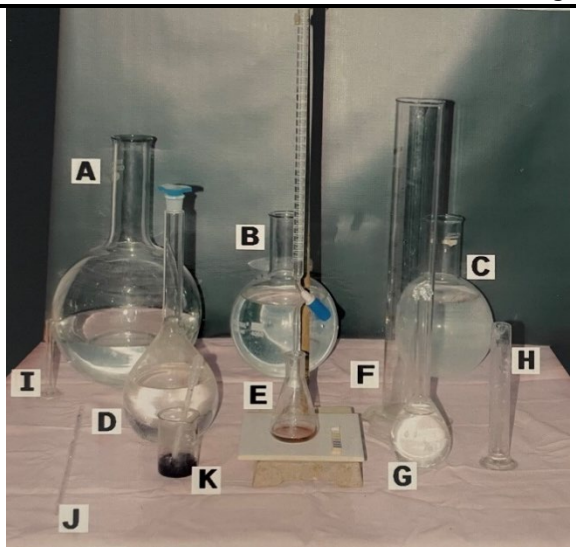


Fig.2 Estimation of Total Hardness

Starting Point
(Wine Red)
A: Soft Water B: Moderately Hard Water
C: Hard Water D: Ammonia Buffer Solution
E: Conical flask F: Measuring Cylinder (H, I)
G: NaOH Buffer Solution J: Pipette
K: Ericrome Black- T

Estimation of Total Hardness

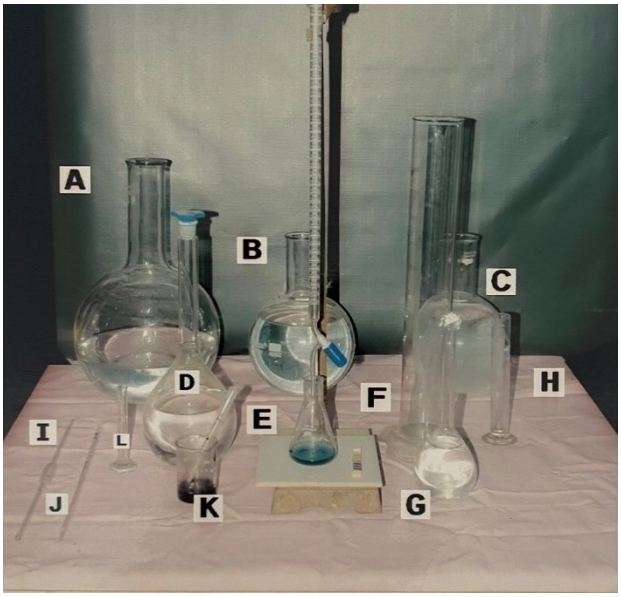


Fig.3 Estimation of Total Hardness

Ending Point
(Blue)
A: Soft Water B: Moderately Hard Water
C: Hard Water D: Ammonia Buffer Solution
E: Conical flask F: Measuring Cylinder (H, I)
G: NaOH Buffer Solution J: Pipette(J)
K: Ericrome Black- T

3.3.2 Estimation of Calcium hardness

Take 10 ml water sample in a conical flask. Add 1 ml NaOH buffer solution to raise pH to 12.0. Add a pinch of murexide indicator**.** Titrate immediately with EDTA till pink colour change to purple. Note down the volume of burette reading. Calcium hardness was calculated.

3.3.3 Estimation of Magnesium hardness

Magnesium hardness is calculated.

3.3.4 Estimation of Permanent hardness

Permanent hardness was estimated by evaporating 100 ml of sample to dryness on water bath. The residue was extracted with freshly boiled hot distilled water and was separated from the insoluble residue of calcium carbonate by filteration.

Filterate added in 10 ml water sample in conical flask. Add 1-2 ml ammonium buffer solution. Add a drop of Erocrome black- T solution and titrate with standard EDTA till wine red colour changes to blue. Note down the burette reading.Permanent hardness was calculated.

Estimation of Calcium hardness

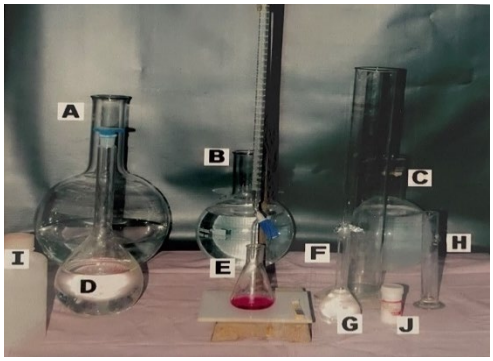


Fig.4 Estimation of Total Hardness

Starting Point
(Pink)

A: Soft Water B: Moderately Hard Water
C: Hard Water D: Ammonia Buffer Solution
E: Conical flask F: Measuring Cylinder (H)
I: Distilled Water G: NaOH Buffer Solution J: Murexide Indictor K :Pipette

Estimation of Calcium hardness

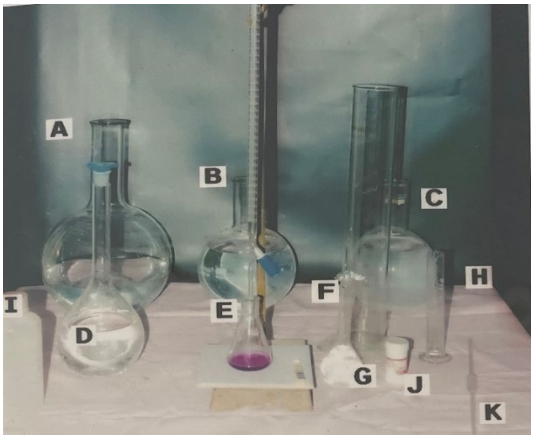


Fig.5 Estimation of Total Hardness

Ending Point
(Violet)

A: Soft Water B: Moderately Hard Water
C: Hard Water D: Ammonia Buffer Solution
E: Conical flask F: Measuring Cylinder (H)
I: Distilled Water G: NaOH Buffer Solution
J: Murexide Indicator K: Pipette

3.3.5 Estimation of Temporary Hardness – Temporary hardness was calculated.

3.4 WET PROCESSING FOR GREY COTTON FABRIC –

Desizing was done to remove sizing material. Then it was followed by scouring to remove impurities such as fats, waxes, pectin etc. Oxidative treatment for scouring was used to destroy natural colouring matter.

3.4.1 Desizing – For selecting best desizing process different process of desizing process were carried out to obtain best result. For desizing various process were done -Rot seeping, Acid desizing, Enzymatic (malt diastase desizing), Hydrogen peroxide desizing, Sodium per sulphate desizing

(i) Rot Steeping – This procedure involves steeping grey cotton cloth in water in an appropriate box for 12 hours at a temperature of about 40 °C. Microorganisms grow during storage and release enzymes that break down starch. This partially transforms the swollen and hydrolyzed starch into soluble form, which is subsequently extracted from the cloth by a standard water wash. The main problems with this approach are low efficiency brought on by extended treatment times and cellulose breakdown from mildew cross-infections if the fermentation process is not properly controlled.

(ii) Acid desizing- In this method grey cotton sample was treated with dilute 5% sulphuric acid at 40 ℃ for 3 hours.

(iii) Enzymatic desizing – (Malt diastase) 5 gm/ liter malt diastase enzyme was used for desizing at 60℃ for 2 hours pH at 7.5 pH., 7gm/liter wetting agent at 98℃ for 2 minutes.

Summary of desizing process-

Table 1

Rot Steeping –

1.	M: L: R	1:40
2.	Time	12 Hrs.
3.	Temperature	40

Table 2

Acid desizing

1.	M: L: R	1:40
2.	Time	3 Hrs.
3.	Temperature	40℃
4.	Acid concentration	5% H_2SO_4 O.W.F.

Table 3

Enzymatic desizing-

1.	M: L: R	1.40
2.	Time	2 Hrs.
3.	Temperature	50 ℃
4.	pH	7.5
5.	Malt diastase	5 gm/ liter

Table 4

Sodium Persulphate desizing –

1.	M: L: R	1: 40
2.	Time	2 Minutes
3.	Temperature	95 ℃
4.	pH	10-10.5
5.	Sodium persulphate	5 gm/ liter
6.	Caustic Soda	8 gm/ liter
7.	Wetting agent (detergent)	7 gm/ liter

Enzymatic desizing- In actual grey cloth was padded wirh desizing mixture containing 5 gm/litre for 3 hrs. pH was adjusting 7.5. Enzymatic desizing was done on grey cotton at 50℃ for 2 hrs with hard (500 ppm) moderately hard (230) and soft (less than 50 ppm) water.

3.4.2 Scouring- Scouring was done on desized sample. Scouring of cotton was done with alkaline agents. In this process the desized cotton sample was boiled in 6% sodium hydroxide (o.w.f) solution for 6 hours.

Table 5

Scouring-

1.	NaOH	6 % o. w.f.
2.	Time	6 Hrs.
3.	Temperature	100℃
4.	M. L. R.	1: 30

Sodium hydroxide scouring is done on enzymatic desized cotton fabric with hard, moderately hard and soft water.

Table 6

3.4.3 Bleaching –

1.	H2O2	2.5 -4 % o. w. f
2.	Soda Ash	8 % o. w. f
3.	Caustic Soda	5 % o. w. f
4.	Sodium Silicate	3 % o. w. f

All the quantities are expressed in percentage of the weight of fabric (o. w.f.). The scoured fabric was impregnated with bleaching liquor which contains H_2O_2 (50%), take 4% o. w. f., soda ash was 8% o. w. f. and caustic soda 5% o. w. f. and sodium silicate 3% o. w. f. used as a stabilizer for 2 hrs at the 100 ℃. The pH of bleaching liquor was kept between 9-10. After bleaching, the fabric was rinsed thoroughly.

3.4.4 Dyeing-

(i) Direct Dye – 1% dye shade was done on bleached fabric with hard (500 ppm) and moderately hard and soft water.

Table 7

Recipe of Direct dye

1.	Dye	1 % shade
2.	M. L. R.	1 :40
3.	Na_2CO_3	5 % o. w. f.
4.	NaCl	5% o. w. f.
5.	Wetting agent	As required

Take calculated amount of dye in a bowl. Add lissapol and Soda ash. Stir it to make a dye paste. Take required amount of water according to M : L: R. When water was at 40℃ added first lot of dye paste into water and dip the fabric and maintain for 10 minutes, then replace the fabric. Second lot of dye paste into dye bath and raise the temperature up to 60 ℃. After addition of the dye, maintain the temperature at 60℃ for 10 minutes. Then take out fabric from the dye bath. Add remaining part of the dye paste into water and raise the temperature up to 80 ℃. Maintain temperature at 80℃ and maintain for 10 minutes. Again, take out fabric from the dye bath. Remove the fabric from dye bath and required amount of salt was added and put the fabric back in the dye bath. Drain, rinse and dry the fabric.

(ii) Cold reactive dye – It is done on bleached fabric with hard and moderately hard and soft water.

Table 8

Recipe of Cold Reactive dye

1.	Dye	1%
2.	M. L. R.	1: 30
3.	Glauber's Salt	30%
4.	Soda Ash	20%

Take calculated amount of dye and water, continuously stir for 10 minutes. First installment of Glauber's salt and soda ash were added and continuously stirred for 5 minutes. Then, second installment of Glauber's salt and soda ash is added and stirred for 5 minutes. After this, last installment of Glauber's salt and soda ash is added and continuously stirred for 50 minutes. Then, fabric was added into it and continuously stirred for 50 minutes.Drain, rinse and dry fabric.

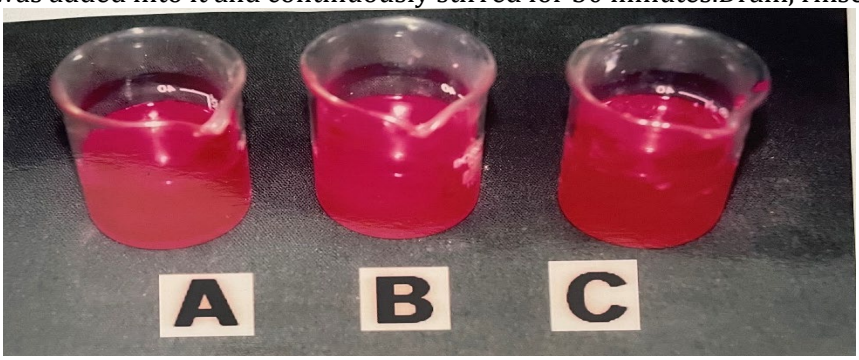


Fig.6. Dye liquor after dyeing (A: Soft Water, B: Moderately Hard Water, C: Hard Water)

3.5 ANALYSIS OF THE TREATED SAMPLES -

3.5.1 Weight loss percentage- The desized and scoured samples were evaluated on the basis analysis of weight loss percentage was measured by the following formula

$$\text{Weight loss } \% = \frac{\text{Initial weight} - \text{after weight} \times 100}{\text{Initial weight}}$$

3.5.2 Whiteness index - The bleached sample was evaluated by post graduate students of Clothing and Textiles. The samples were evaluated visually on the basis of whiteness index. The views were collected separately. Percentage was calculated from the collected data.

3.5.3 Wettability Test - The fabric was placed on embroidery frame. A drop of distilled water dropped by the burette. Time was taken with stop watch when drop sinks and time was again taken when the brightness of drop disappeared. Mean values ware calculated from the reading and with the help of readings and wettability of fabric was determined.

3.5.4 Dye absorbency of the hard, moderately hard and soft water -

Dye absorbency percentage was determined by spectrometer 20. Readings were taken in percentage. The instrument was set at 540 wave length with the help of knob. A blank solution (distilled water) was placed inside the instrument set monitor at zero. After that the dye solution which was tested placed inside the instrument and reading was directly read from the monitor. Two readings were taken before the dyeing and after the dyeing. Dye solution was diluted 10 times. The percentage dye absorption was calculated by the given formula-

$$\% \text{ Dye absorption} = \frac{\text{Before reading} - \text{after reading} \times 100}{\text{Before reading}}$$

Percentage dye absorption was calculated for hard, moderately hard and soft water treated sample.

3.5.5. Intensity of Shade- The dyed samples evaluated by intensity of shade of the samples was evaluated by panel of judges visually on the basis of two criteria that is dull shade and bright shade. The views were collected separately, percentage was calculated from the collected data.

4. RESULTS & DISCUSSION

The results of the study were divided under following sections -

4.1 Preliminary data of fabric
4.2 Analysis of water
12.1 Hardness of industrial area water
42.2 Hardness of moderately hard water
42.3 Hardness of distilled water
4.3 Analysis of desized samples
4.4 Analysis of scoured samples
4.5 Analysis of bleached samples
4.6 Analysis of dyed samples
4.7 Comparative analysis of all the samples

4.1: Preliminary data of the fabric

Table 9

Fabric details

Fabric	Thread count	Thickness (mm)	Weight (gm/cm²)
Grey cotton	46× 45	0.33	1.99

The above data depicts that weight of the fabric was found to be 1.99 gm/m². The fabric was of 0.33 mm thickness and thread count of the fabric was 46 × 45.

4.2 ANALYSIS OF WATER

12.1 Hardness of Sample water

Table 10

Total Hardness

S. No.	Starting Point (ml)	Ending Point (ml)	Burette reading (ml)
1.	0.001	5.0	5.0
2.	5.1	10.1	5.0
3.	10.1	15.2	5.1
4.	15.2	20.2	5.0

Total Hardness = 500

It was inferred from the above data that sample of water taken for the study was hard water as hardness was found to be 500 ppm.

Table 11
Permanent Hardness

S. No.	Starting Point (ml)	Ending Point (ml)	Burette reading (ml)
1.	0.00	0.9	0.9
2.	0.09	1.8	0.9
3.	1.8	2.7	0.9
4.	2.7	3.6	0.9

The above table shows that the permanent hardness of water sample taken for the study was 90 ppm, when measured.
Temporary Hardness

Temporary Hardness= 410 PPM

It depicts that the temporary hardness of water sample taken for study was 410 ppm when calculated.

Table 12
Calcium Hardness

S. No.	Starting Point (ml)	Ending Point (ml)	Burette reading (ml)
1.	0.00	3.1	3.1
2.	3.1	6.3	3.2
3.	6.3	9.4	3.1
4.	9.4	12.3	3.1

Calcium Hardness= 310 PPM

The table shows that the calcium hardness of water sample taken for study was 310 ppm when estimated.
Magnesium Hardness

Magnesium Hardness = 190 PPM

It depicts that the magnesium hardness of water sample taken for study was 190 ppm when estimated.

Different type of hardness of water sample collected from Textile Chemistry Lab.

Table 13
Type of Hardness

Types of Hardness	Hardness in ppm
Total Hardness	500 ppm
Permanent Hardness	90 ppm
Temporary Hardness	410 ppm
Calcium Hardness	310 ppm
Magnesium Hardness	190 ppm

The above data depicts that water sample taken for the study had total hardness of 500 ppm. The permanent hardness was 90 pm, and temporary hardness was found to be 410 pm. Calcium and magnesium hardness was found to be 310 pm and 90 ppm respectively.

4.2.2 Hardness of moderately hard water

Table 14
Total Hardness

S. No.	Starting Point (ml)	Ending Point (ml)	Burette reading (ml)
1.	0.00	2.1	2.1
2.	2.1	4.2	2.1
3.	4.2	6.2	2.0
4.	6.2	8.3	2.1
5.	8.3	10.4	2.1

Total Hardness= 210 PPM

The above table shows that the total hardness of water sample was found to be 210 ppm, when calculated.

Table 15
Permanent Hardness

S. No.	Starting Point (ml)	Ending Point (ml)	Burette reading (ml)
1.	0.00	0.5	0.5
2.	0.5	1.0	0.5
3.	1.0	1.5	0.5
4.	1.5	2.0	0.5

Temporary Hardness

Permanent Hardness = 50 PPM

Temporary Hardness = 160 PPM

It depicts that the temporary hardness of water was found to be 160 ppm when calculated.

Table 16
Calcium Hardness

S. No.	Starting Point (ml)	Ending Point (ml)	Burette reading (ml)
1.	0.00	1.5	1.5
2.	1.5	3.0	1.5
3.	3.0	4.4	1.4
4.	4.4	5.9	1.5
5.	5.9	7.5	1.5

It shows that the **Calcium Hardness= 210 PPM** calcium hardness of water sample was found to be 50 ppm when measured.

Magnesium Hardness

It depicts that the magnesium hardness of the water sample was found to be 60 ppm when calculated.

Magnesium Hardness= 60 PPM

Different types of hardness of moderately hard water –

Table 17
Type of Hardness

Type of Hardness	**Hardness in ppm**
Total Hardness	210 ppm
Permanent Hardness	50 ppm
Temporary Hardness	160 ppm
Calcium Hardness	150 ppm

Magnesium Hardness	60 ppm

The above data depicts that the moderately hard water had total hardness 210 ppm. The permanent hardness was 50 pm and temporary hardness was found to be 160 ppm. Calcium and magnesium hardness was found to be 150 and 60 ppm respectively.

4.2.3 Hardness of distilled water

Table 18

Soft Water (Water hardness)

S. No	Starting Point (ml)	Ending Point (ml)	Burette reading (ml)
1.	0.01	0.1	0.1
2.	0.1	0.2	0.2
3.	0.2	0.3	0.3
4.	0.3	0.4	0.4

Total Hardness = 10 PPM

It was inferred from the above table that the sample of water came in the range of soft water as hardness estimated was 10 ppm.

Table 19

Distilled Water

Name of Hardness	Hardness in ppm
Total Hardness	10 ppm
Permanent Hardness	-----
Temporary Hardness	10 ppm

The above data depicts that the distilled water sample had total hardness 10 ppm and permanent hardness was nil. Temporary hardness was found to be 10 ppm.

Comparison of different hardness of water samples

Table 20

Comparison of Hardness of water

Water Sample	Total Hardness (ppm)	Permanent Hardness (ppm)	Temporary Hardness (ppm)	Calcium Hardness (ppm)	Magnesium Hardness (ppm)
Hard Water	500	90	410	310	190
Moderately Hard Water	210	50	160	150	60
Soft Water	10	---	10	10	----

The above data depicts the comparison of hardness of different samples of hard water. It was found that total hardness of hard water was maximum (500 pm), for moderately hard water. It was 210 ppm and for soft it was 10 ppm. The permanent hardness of hard water and moderately hard water was found to be 90 ppm and 50 ppm respectively. The temporary hardness of hard water was maximum (410 ppm). For moderately hard water, it was160 ppm and for soft, it was 10ppm. And calcium hardness of hard water, was maximum (310 ppm), for moderately hard water, it was 150 ppm and for soft it was 10 ppm. The magnesium hardness of hard water and moderately hard was found to be 190 ppm and 60 ppm respectively.

4.3 COMPARATIVE ANALYSIS OF DIFFERENT DESIZING METHODS –

Table 21

Comparison of different desizing methods

Desizing Methods	Percentage weight loss
Rot Steeping	6.8 %
Acid Steeping	6.7 %
Hydrogen Peroxide	6.3 %
Sodium Persulphate	11 %
Enzymatic	21.5*%

The above data depicts that the comparison between different desizing methods. It was observed that enzymatic (malt diastase) desizing method gave good results. The percentage weight loss was found to be maximum (21.5 %) with enzymatic (malt diastase) desizing.

Desizing Samples

1. Rot Steeping

2. Acid Steeping

3. Hydrogen peroxide

4. Sodium Persulphate

5.Enzymatic (malt diastase)

Enzymatic desizing with different samples of water (hard, moderately hard and soft)

Table 22

Fabric weight loss after Desizing

Water Samples	Weight loss%
Hard Water	19.2 %
Moderately Hard Water	18.3%
Soft Water	21.5%

It was observed from the above data that the weight loss % of the grey fabric after desizing was found to be maximum (21.5%) when treated with soft water as compared to hard water and moderately hard water. It was observed that there was less difference in percentage weight loss of grey fabric after desizing when treated with hard and moderately hard water.

DESIZED SAMPLES

Hard Water

Moderately Hard Water

Soft Water

Sodium hydroxide scouring with different samples of water (hard, moderately hard and soft)

Table 23

Weight loss during scouring process

Water Samples	Weight loss %
Hard Water	4.6 %
Moderately Hard Water	5.6%
Soft Water	5.3%

It was inferred from the above data that weight loss percentage during scouring process was found to be maximum (5.6 %) when treated with moderately hard water, weight loss percentage after scouring was found to be 5.3 % when treated with soft water. It was observed that weight loss after scouring was maximum (4.6%) when treated with hard water.

Desized and scoured Samples

Hard Water

Moderately Hard Water

Soft Water

Desized, scoured and Bleached Samples

Hard Water

Moderately Hard Water

Soft Water

4.5 ANALYSIS OF THE BLEACHED SAMPLES

Table 24

Whiteness of the bleached samples treated with different water samples (hard, moderately hard, and soft water)

Water Samples	Whiteness
Hard Water	4
Moderately Hard Water	3
Soft Water	$3/4$

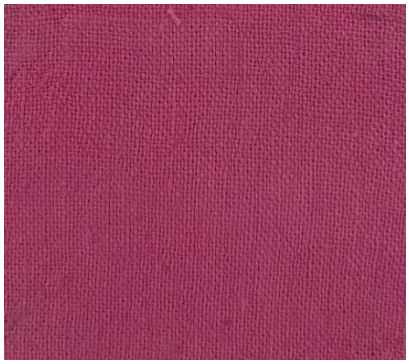
It was observed from the above data the whiteness of bleached sample was found to be maximum when treated with moderately hard water but there was not much difference found between bleached samples of moderately hard and soft water.

Desized, Scoured, Bleached and Direct Dyed Samples

Hard Water

Moderately Hard Water

Soft Water



4.6 ANALYSIS OF DYED SAMPLE

Exhaustion of dye (direct dye) on different samples treated with different water samples (Hard, moderately hard and soft)

Table 25

Intensity of Shade

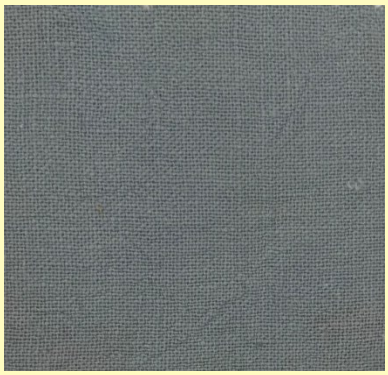
Water Samples	Intensity of Shade
Hard Water	Fair
Moderately Hard Water	Very Good
Soft Water	Good

It was inferred from the above data that the intensity of the shade of the dyed sample (direct dye) was found to be maximum when treated with moderately hard water compared to soft and hard water.

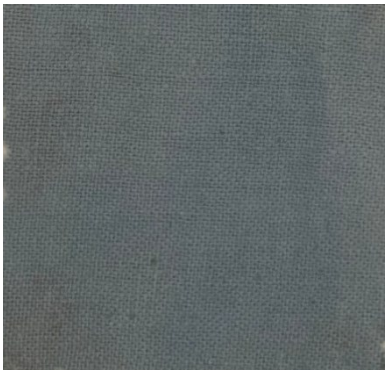
Desized Scoured, Bleached and reactive Dyed Samples

Hard Water

Moderately Hard Water



Soft Water



Exhaustion of dye (cold reactive) on different samples treated with different water samples (hard, moderately hard and soft).

Table 26
Intensity of the shade (Cold Reactive)

Water Samples	Intensity of Shade
Hard Water	Fair
Moderately Hard Water	Very Good
Soft Water	Good

It was observed from the above data that the intensity of the shade of the dyed sample (cold reactive dye) was found to be maximum when treated with moderately hard water as compared to soft and hard water.

2.. Percentage dye absorption of dyed samples treated with different water samples (hard, moderately hard and soft)

Table 27
Dye Absorption

Water Samples	Percentage of absorption
Hard Water	68%
Moderately Hard Water	78.6%
Soft Water	70.6%

It was inferred from the above data that the percentage dye absorption of dyed sample was more when treated with moderately hard water as compared to soft and hard water.

Wettability of Sample

Table 28
Wettability of desized samples –

S. No.	Desized Sample	Time Taken for absorption of water Droplet
1.	Controlled	2 Hours
2.	Hard Water	25 Minutes

3.	Moderately Hard Water	65 Seconds
4.	Soft Water	50 Seconds

It was observed that wettability of soft water was found to be good as compared to hard water. There was not much difference between moderately hard and soft water. And poor wettability was observed when treated with hard water.

Table 29

Wettability of scoured samples

S. No	Scoured Samples	Time Taken for absorption of water droplet
1.	Controlled	50 Seconds
2.	Hard Water	30 Seconds
3.	Moderately Hard Water	13 Seconds
4.	Soft Water	10 Seconds

It was inferred from the above data that wettability of moderately hard water was found to be good as compared to soft and hard water. There was not much difference between, moderately hard and soft water. And poor wettability was observed when treated with hard water.

Table 30

Wettability of the bleached samples

S. No	Bleached Samples	Time Taken
1.	Controlled	50 Seconds
2.	Hard Water	5 Seconds
3.	Moderately Hard Water	3 Seconds
4.	Soft Water	4 Seconds

It was observed from the above data good wettability of bleached samples when treated with moderately hard water was good as compared to soft and hard water. There was not much difference in wettability of bleached samples treated with different samples of water (hard, moderately hard and soft).

Comparison of wettability of samples

Table 31

Comparison of wettability of samples

S. No.		Hard Water	Moderately Hard water	Soft Water
	Control	2 Hrs.	2 Hrs.	2 Hrs.
1.	Desized Samples	25 Minutes	63 Seconds	50 Seconds
	Control	50 Seconds	50 Seconds	50 Seconds
2.	Scoured samples	30 Seconds	13 Seconds	15 Seconds
	Control	15 Seconds	15 Seconds	15 Seconds
3.	Bleached samples	5 Seconds	3 Seconds	4 Seconds

It was observed from the above table that bleached samples had good wettability as compared to desized and scoured sample when treated with different samples of water.

5. SUMMARY AND CONCLUSION

In desizing process, the percentage weight loss was found to be more with soft water as compared to hard and moderately hard water. In scouring process, it was found that weight loss percentage was found to be more with moderately hard water as compared to soft and hard water. In bleaching process, it was assessed by whiteness index that sample treated with moderately hard water was found white as compared to soft and hard water. In direct and cold reactive dyed samples when treated with moderately hard water was found to have darker shade as compared to when treated with soft and hard water. For dyed samples when treated with moderately hard water, it was found to have more percentage dye absorption as compared to when treated with soft and hard water.

The results of the study proved that extreme hardness of water has profound effect on textile processing as presence of calcium and magnesium salts decrease the efficiency of enzymes, sodium hydroxide, soaps, dyes and bleaching agents. Thus, it was concluded that moderately hard water taken for the study gave good results when taken for textile wet processing. Thus, it means some degree of hardness is required for different textile wet processing.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

None

REFERENCES

Bajpai, S. (2007). Effect of different desizing methods on Comfort and physical properties of Khadi.

Bucker, J., I. and Janecek, C., M. (1970). Water quality and its effect on white fabrics.

Chapatwala et al., (1994). Effect of water hardness and total dissolved solids on dyeing of polyesters and cationic dyeable polyester. *Colourage*. 29-40.

Chougule, M., B. (2020). An experimental study of effect of water quality on cotton textile wet processing. *International Journal of Research and development in Technology*.6(5).41-47.

Gopalkrishnan, M., Punitha, V. and Saravanan, D. (2019). Water conservation in textile wet processing. *Water in Textiles and Fashion*. 135-153.

Gupta, H. (1998). Comparative study of bleaches on grey cotton fabric.

Ho, K., C. and Hui, K., C., C. (2001). Chemical contamination of the East River (Dongjiang) and its implication on sustainable development in the Pearl River Delta. *Environmental International*. 26(5-6). 303–308. 10.1016/S0160-4120(01)00004-6

Kaur, S. (1997). Effect of hardness of water dyeing and laundering of cotton fabric.

Khatri, N. and Tyagi, S. (2014). Influences of natural and anthropogenic factors on surface and groundwater quality in rural and urban areas. *Frontiers in Life Science.* 8(1).1-17.

Kimbrough, R., A. and Litke, D. (1996). Pesticides in streams draining agricultural and urban areas in Colorado. *Environmental Science Technology*. 30(3). 908–916. 10.1021/es950353b

Krishnamurthy, N. (2001). Applied Chemistry. Tata McGraw-Hill.

Kumari, B., K. (2016). A Study on The Estimation of Hardness in Ground Water Samples Byedta Tritrimetric Method. *Journal of Applied Chemistry*. 9(10). 26-28.

Menezes, et al. (2004). Water in textile Wet processing quality and measures. *Colourage*.35-40.

Moraes, G. D., Freire, R, S. and Duran, N. (2000). Degradation and toxicity reduction of textile effluent by combined photocatalytic and ozonation processes. *Chemosphere.* 40(4). 369–373. https://doi.org/10.1016/S0045-6535(99)00239-8

N.C. (2009). Division of Pollution Prevention and Environmental Assistance. Water Efficiency Industry Specific Processes: Textiles. North Carolina.

Sengupta, P. (2013). Potential Health Impacts of Hard Water. *International Journal of Preventive Medicine*. 4(8). 866-875.

Shinde, T., A., Marathe, R. and Dorugade, V., A. (2015). Effect of water hardness on reactive dyeing of cotton. *International Journal on Textile Engineering and Processes*. 1(4). 28-34.

Smith, B., et al., (1987). Water And Textile Wet Processing -Part I. Department of Textile Chemistry, NCSU, Raleigh, NC.

Wurts, W., A. (1993). Understanding Water Hardness. *World Aquaculture*.24(1). 18.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 263–267

A SUSTAINABLE APPROACH TOWARDS ART PRACTICES: EMBRACING SOCIAL RESPONSIBILITY

Dr. Shanta Sarvaiya[1]

[1]Assistant Professor, Faculty of Fine Arts, The M.S. University of Baroda

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1336

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

This article advocates for a sustainable approach in sculpture education, recognizing the environmental impact of traditional sculpture-making processes such as stone carving, wood carving, metal casting, and ceramics. By promoting the use of eco-friendly materials, encouraging the exploration of alternative techniques, and fostering a mindset of resourcefulness and conservation, art institutions and educators can play a crucial role in shaping a new generation of sculptors committed to environmental stewardship and social responsibility. Art has always been a reflection of society, shaping narratives, perceptions, and attitudes. In the modern era, the role of art extends beyond aesthetics, towards embracing social responsibility. This research explores the evolving landscape of art practices, emphasizing sustainability as a core principle. By examining case studies, strategies, and the impact of socially responsible art, this article aims to highlight the importance of artists and institutions in fostering positive change within communities. Through a sustainable approach to art, we can not only create visually captivating works but also inspire social progress and environmental consciousness.

Keywords: Sculpture education, Sustainability, Environmental impact, Traditional sculpture-making processes, Eco-friendly materials, Alternative techniques, Resourcefulness, Environmental stewardship, Socially responsible Art, Role of art, Modern era, Aesthetics

1. INTRODUCTION

Art, throughout history, has been a powerful medium for expressing emotions, ideas, and cultural identities. However, in today's rapidly changing world, the role of art has expanded to encompass a broader responsibility towards society and the environment. Artists and institutions are increasingly recognizing the impact their work can have on social issues, prompting a shift towards sustainable art practices.

2. EVOLUTION OF ART AND SOCIAL RESPONSIBILITY

The concept of social responsibility within art is not entirely new. Throughout history, artists have used their talents to shed light on injustices, advocate for change, and provoke critical thought. From the politically charged works of Diego Rivera to the social commentary of Banksy, art has served as a mirror to society's triumphs and failings.

In recent decades, however, there has been a notable surge in the integration of sustainability into artistic endeavors. This shift reflects a growing awareness of environmental issues, human rights violations, and social inequalities. Artists are now using their platforms to not only create visually compelling works but also to address pressing global challenges.

3. CASE STUDIES IN SUSTAINABLE ART PRACTICES

- **Theaster Gates:** Gates, an American social practice installation artist, is renowned for his work in revitalizing neglected urban spaces. Through his Dorchester Projects in Chicago, Gates transformed abandoned buildings into community hubs, art spaces, and affordable housing. His approach emphasizes the reuse of materials, community engagement, and economic empowerment.

Image of before and after-Gates' 2009 project *Dorchester Projects* is an investment of an abandoned 2 story property that has been recycled and turned into a Library, Slide Archive and Soul Food Kitchen (Esmaamohamoud).

- Gates' *Dorchester Projects* utilizes repurposed materials from all over Chicago, giving the project both a practical and expressive aesthetic, connecting the development of new art with the economic reuse of material resources.
  This initiative began with Gates acquiring abandoned buildings in the neighbourhood and transforming them into multifunctional spaces that serve the community in various ways. Instead of seeing blighted structures as mere eyesores, Gates saw potential in them as platforms for social change and cultural revitalization.

Community engagement is central to Gates' practice. He actively involves local residents in the planning, creation, and programming of his projects, ensuring that they have a stake in the revitalization efforts and that the projects meet their needs and aspirations. This collaborative approach fosters a sense of solidarity and collective empowerment among community members. By revitalizing neglected urban spaces and creating opportunities for local artists and entrepreneurs, he seeks to stimulate economic growth and create sustainable pathways out of poverty for residents of underserved communities.

- **Olafur Eliasson:** This Danish-Icelandic artist is celebrated for his immersive installations that explore the relationship between humans and nature. Eliasson's "Ice Watch" installation, where he brought massive ice blocks from Greenland to city centers, served as a poignant visual reminder of climate change's impact. By directly involving the public in his art, Eliasson raises awareness and fosters conversations about sustainability.

Ice Watch 2018: the effects of global warming in Olafur Eliasson's installation **Ice Watch** is the name of the installation signed by **Olafur Eliasson**, an Icelandic artist born in 1967, who decided to invade the banks of the Thames, in front of the **Tate Modern,** with huge blocks of ice. The installation forms the shape of a clock face that constantly reminds us that there are only 12 years left to try to reduce the devastating effects of global warming (Fuggetti).

Vineet Barot, a sculptor hailing from the Faculty of Fine Arts in Baroda, has started making significant wave in the Indian art scene with his innovative use of scrap metal. His latest endeavour, the "Waste to Art-Dinosaur Park" situated in New Delhi, spans across 3.5 acres adjacent to the Waste-to-Wonder Park at Sarai Kale Khan. This ambitious project showcases 40 intricately crafted dinosaurs, all fashioned from donated scrap materials sourced primarily from the Delhi Municipal Corporation.

Waste to Art- Dinosaur Park in New Delhi 2023

Barot's approach to sculpting involves infusing emotion into each piece by utilizing various types of scrap, ranging from industrial waste to discarded cars and jeeps. He believes that different types of scrap carry distinct emotional resonances, which he skilfully incorporates into his sculptures. The result is a collection of works that not only stimulate creativity but also invite viewer interaction.

For Barot, the core principles of his art revolve around environmental consciousness, creativity, and the transformative power of art itself. Through his sculptures, he aims to not only repurpose waste materials but also to spark conversations about environmental sustainability and the potential for artistic expression to inspire positive change.

It features 40 dinosaur replicas made from scrap materials. The park, which is designed to cater to children, is part of the second phase of the waste-to-wonder park and is free to enter. The park also includes replicas of the Seven Wonders of the World. It cost an estimated INR 13.72 crore ($1.9 million) to build and used around 300 tonnes of waste in its development (Singh).

4. STRATEGIES FOR SUSTAINABLE ART

- **USE OF ECO-FRIENDLY MATERIALS:** Artists are increasingly turning to sustainable and recycled materials for their creations. From sculptures made of reclaimed wood to paintings on recycled paper, these choices not only reduce environmental impact but also send a powerful message about resourcefulness.
- **COMMUNITY ENGAGEMENT:** Collaborative art projects that involve local communities can have a lasting impact. By co-creating with residents, artists can address community needs, promote social cohesion, and empower individuals through artistic expression.
- **ART AS ADVOCACY:** Many artists are using their work as a form of advocacy, advocating for social justice, climate action, and human rights. Through exhibitions, performances, and public installations, they raise awareness and inspire action on pressing issues.

5. IMPACT AND BENEFITS OF SOCIALLY RESPONSIBLE ART

- **RAISING AWARENESS:** Art has a unique ability to communicate complex issues in a visually engaging manner. Socially responsible art can raise awareness about environmental degradation, social inequalities, and other pressing concerns, reaching audiences that traditional forms of activism might not.
- **INSPIRING ACTION:** Beyond awareness, art can inspire tangible change. When people are moved by a piece of art, they are more likely to take action, whether it's reducing their carbon footprint, supporting marginalized communities, or advocating for policy reform.
- **FOSTERING EMPATHY:** Through storytelling and personal narratives, art can foster empathy and understanding. By highlighting the experiences of marginalized groups or the effects of climate change on vulnerable communities, art encourages viewers to see the world from different perspectives.

6. CONCLUSION

As the world grapples with environmental crises, social injustices, and other complex challenges, the role of art becomes increasingly vital. Artists and institutions have a unique opportunity to embrace sustainability and social responsibility in their practices, creating meaningful works that inspire positive change. By highlighting case studies, strategies, and the impact of socially responsible art, this research underscores the transformative potential of art in building a more sustainable and equitable world.

In the words of artist Olafur Eliasson, "Art can change the world." Through a sustainable approach towards art practices and a commitment to social responsibility, artists can indeed be powerful agents of change, shaping a brighter future for generations to come.

CONFLICT OF INTERESTS
None

ACKNOWLEDGMENTS
None

REFERENCES
Gates, T. (2016). How to revive a neighborhood: with imagination, beauty, and art. TED Talk.
Eliasson, O. (2019). The art of transforming a city. TED Talk.
Studio Swine. (n.d.). Can City. Retrieved from https://www.studioswine.com/can-city
Kester, G. (2013). The One and the Many: Contemporary Collaborative Art in a Global Context. Duke University Press.
Bishop, C. (2012). Artificial Hells: Participatory Art and the Politics of Spectatorship. Verso.
Kwon, M. (2004). One Place After Another: Site-Specific Art and Locational Identity. MIT Press.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 250–257

TRENDS OF TECHNOLOGICAL ADVANCEMENT IN KATHPUTLI ART FORM

Shubhi Awasthi[1], Dr. Gunja Soni[2], Dr. Rena Mehta[3]

[1]Research scholar, at Poornima University
[2]Associate professor, at Poornima University
[3]Associate Professor and Research Head in Design at the Indian Institute of Crafts and Design in Jaipur

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1325

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

The puppetry art form is inherently tied to the lives and traditions of India. One such art form Rajasthan Kathputli ensures cultural heritage is preserved, identity is fostered, and community pride is promoted for practitioners and audiences. In recent years social media platforms like YouTube, Instagram, WhatsApp, and Facebook have helped this art form to connect to new audiences and cultural exchange has opened new avenues for performances. In the last few years with the evolution of digital technology Kathputli art form has evolved, On the other side technological interventions like projection, animations, and sound effects have also resulted in changing the methodology and storytelling narratives of this art form. This paper looks into recent emerging trends of Technological advancement in the traditional puppetry art form of Rajasthan. The interviews of artisans and observation of various tourist places in Rajasthan have been to understand the change better. In addition, research papers were used to comprehend the scenario.

Keywords: Social, Media, Puppetry, Technological interventions, Rajasthan, Folk.

1. INTRODUCTION

In the last 15 years, technological advancement has drastically affected our everyday lives and work. Social media advertising, adopted by various brands like Zomato, Swiggy, Paytm, WhatsApp, Facebook, etc, has transformed the advertising industry by creating buzz, prioritizing customer support, and fostering trust, leading to increased creativity. (Khan and Priya #) Advertisements and promotional activities often encourage individuals to purchase items or avail services.

Digital applications like Zomato, Blinkit, Amazon, and Flipkart have made life easier, Zoom and WhatsApp have eliminated the feeling of distance to a great extent, these are just a few of many examples. Folk art is the art of people and reflects changing lives. It adapts itself to changing times, whereas classical art is static. One such folk art is the puppetry art form of Rajasthan, which is also known as Kathputli art. Through the example of the puppetry art form in this paper, we explore how folk arts adapt to changing times and technology.

Figure no. 1.1 Traditional Marionettes of Rajasthan

Kathputli, a traditional puppetry style from Rajasthan, India, has been adapting to the modern age and maintaining its cultural essence through technological advancements in recent years. Augmented Reality, Animation, Mobile Applications for Learning and Promotion, and interactive puppets have helped this art form smoothly for the people of different countries. The intervention of technology like projection, animations, and sound effects has also transformed the methodology and storytelling narratives of the Kathputli art form.

2. OBJECTIVES-

The present study focuses on the following objectives:

- To understand the emerging trends of technological advancement in the field of the Kathputli art form.
- To understand how technological advancement transforms the Kathputli art form.
- To document design interventions carried out with artisans after understanding the recent trends.

3. METHODOLOGY

The aim of the study was to understand the recent change due to the technological advancement in the field of Kathputli art form. The interviews of artisans and observation of various tourist places in Rajasthan have been conducted to understand the recent changes in art form due to technological advancement. Research papers were used to understand the scenario.

4. SAMPLE SELECTION

A stratified sampling method was used for the field study. Unstructured interviews were conducted with different stakeholders. Jyoti Nagar in Jaipur was identified as a settlement of a traditional community that has been the custodian of this art form for generations. Souvenir shops are other stakeholders of this art form. I visited shops near the tourist places to understand the current trends in the market. This study aimed to understand how technological advancement transformed the Kathputli art form, which was possible through data collection from the grassroots level.

5. DATA COLLECTION

The data was collected from various stakeholders associated with this craft. Secondary data was collected through online media and literary material, which helped in understanding the journey of the art form. Sourced information from books and research papers was considered.

6. FINDINGS AND DISCUSSIONS

Kathputli, a traditional form of puppetry performed and flourished by the Bhat community from Rajasthan, India, is GI tagged handicraft, some technological advancements were observed recently to adapt the Kathputli art form in the modern era while preserving its cultural essence. Here are some technological advancements described briefly happened in the Kathputli art form:

1. **INNOVATIONS IN MAKING-** We can see the changes in wooden dolls as per the requirements of consumers. Now decorative puppets are purchased by tourists as a

Figure no. 1.2 Puppets for hanging purpose

memory of a Rajasthan visit because they give the flavor of the colorful culture and tradition of Rajasthan. If you carefully observe you get to know the puppets sold in the market are for hanging purposes and puppets used by puppeteers for performance are different. Dileep Bhat, a puppet maker of the Kathputli colony of Jyoti Nagar Jaipur, is one of the finest puppet makers of Jaipur, he learned puppet-making skills from elders in Delhi, but he settled

Figure no. 1.3 Traditional Marionettes maker Mr. Dileep Bhat of Jyoti Nagar cluster

in Kathputli colony after his marriage, and has been making puppets for puppeteers for the last thirty years. He made only marionettes and tried contemporary forms of puppets, carved the faces of Sikh, actor Hema Malini, and many other role models, and dressed them in contemporary attire.

Figure no. 1.4 Contemporary puppet faces carved by Mr. Dileep Bhat of Jyoti Nagar cluster

We can easily observe the fusion of puppets or we can say the trend of new forms of puppets in the market. Kathputli means wooden puppets are transforming into the form of statues and even in sets of musicians. Pencil puppets and keychains are also trendy.

Figure no. 1.5 Contemporary puppet statues

Figure no 1.6 Puppet pencils

Figure No 1.7 Key Chains

2. USE OF PROJECTIONS TO SHOWCASE THE ART- During the discussion with Chauthmal Bhat and Nautaria Bhat Nagauri a puppet- maker, and performers, I came to know that these days customers call puppeteers to showcase their art at weddings, government programs, fairs, etc. They project the live recording, or sometimes they record the events, and later they add backdrops, sound effects, etc. The visuals and effects used in traditional Kathputli puppet shows can be thrilling and dynamic. In colleges or private events, puppeteers prepare the script and perform the puppet show, sometimes customers do the video recording of the performance and project later with effects as event storytelling by projecting scenes onto the puppets or enhancing the visual experience.

Folk performing arts, including music, dance, and film, have historically been used for communication and cultural awareness. However, with modern media, these arts have expanded to diverse audiences. They have also been adapted for developmental purposes, such as promoting cultural awareness and preserving heritage. (Suman)Paheli, Dil hai Tumhara, Gulabo Sitabo, and Lamhe are good examples of movies that combine traditional stories themes, and puppets.

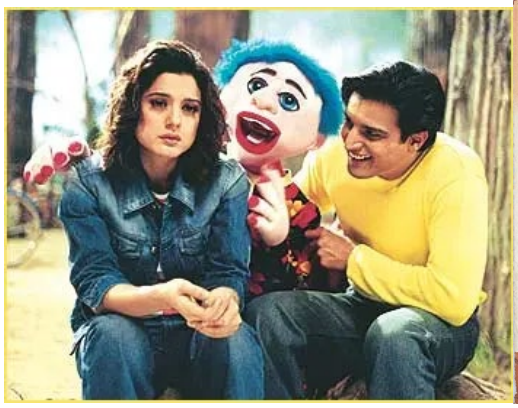


Figure no. 1.8 Movie poster of Dil hai tumhara

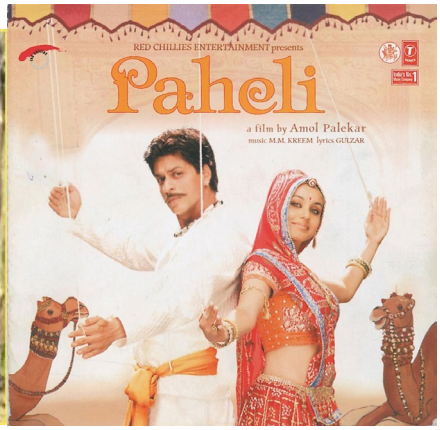


Figure no. 1.9 Movie poster of Paheli

3. INTERACTIVE PUPPETS- Billu Ram Bhat, a puppet performer informed me that in Delhi, puppeteers are trying to explore new mediums to transform traditional puppets for better interaction with the audience. Also, they are making huge puppets using different materials to attract new audiences. We were called into schools to conduct a workshop on puppet making, Even use puppets to teach good food habits, different forms of shapes, storytelling skills, etc.

Application-based learning is increasingly being used to boost children's self-confidence and abilities. Monica Rikić's interactive workshop for 8-11-year-olds involved creating interactive puppets using socks, and electronic and non-electronic items. The children learned basic electronic techniques. (Rikic)

Recently a study by Wang, C.M & Tseng S.M proposes an interactive role-play system as a potential solution to traditional glove puppetry decline, offering an engaging, educational experience and flexibility for different troupes, preserving and passing on the art to future generations. (Wang)

4. USE OF AUGMENTED REALITY (AR) IN PUPPETRY- Last time when I visited Bhartiya Lok Kala Museum, there was a 10-minute free puppet show for the museum visitors. I have seen many puppet shows in Jaipur but it was my first time in Udaipur. I was very excited as was my first experience of puppet show at Udaipur. it was interesting and also different in many ways, they were using pre-recorded music for the show, they were manipulating the strings of puppets with a block, and the strings were tied in that block. I also observed that puppet dresses have more influence on the Rajputana style, as puppet faces are more circular.

5.

Saptarshi Kolay examines currently available research on digital cultural heritage that promotes a better user-driven strategy for information transmission through new media. The study intended to preserve knowledge, including methods, materials, and the essential components of visual art. (Kolay #)

Kathputli performances can effortlessly integrate virtual elements with the physical puppets and stage by using AR technology. In one more interesting paper I read about AR the authors Roy Chakraborty, and Krishnokoli discuss the use of animated documentaries on folk artifact packaging to promote handcrafted objects, aiming to revive vanishing practices and encourage informed consumer choices. The project works on traditional Blue Potteries, Tie Dyed & Ajrakh Printed Textiles, and Lac Jewelleries. (Chakraborty #)

Steve Tillis's purpose of the research was to find the creative future possibilities between animatronic figures and hand puppets by analyzing the differences between animatronic tangible figures and hand puppets, the artists saw some opportunities in new media. (Tillis #)

6. IN ANIMATION- Doordarshan, an Indian television channel, aired a children's puppet series called Potli Baba Ki in 1991, featuring fairy tales, moral messages, folk cultures, and Indian handicrafts.

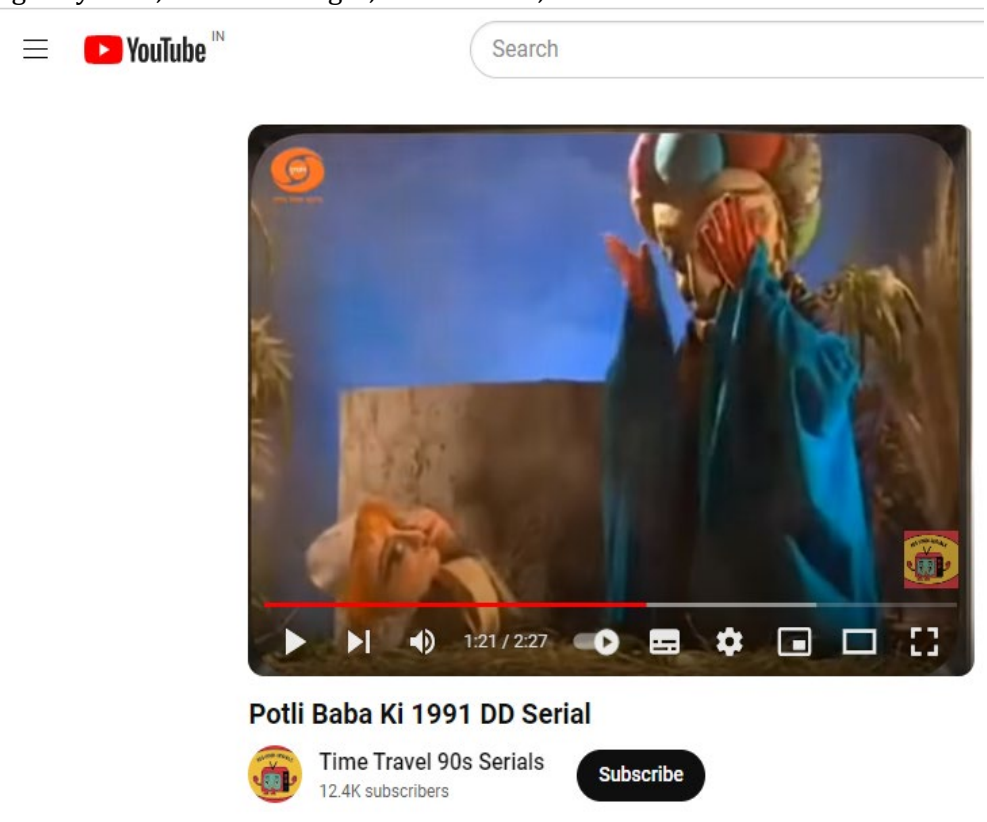


Figure no. 1.10 Image clip of Potli Baba ki from YouTube

Galli Galli Sim Sim, a Hindi adaptation of Sesame Street, is a popular television series that premiered in 2006.

Figure no. 1.11 Image of serial Galli Galli Sim Sim poster

Traditionally handcrafted puppets can be scanned and digitized, allowing for the creation of digital storyboards and animations.

7. REMOTE PERFORMANCE CAPABILITIES- A few puppeteers in the cluster such as Prakash Bhat and Nautiyal Bhat Nagauri told me that during the COVID-19 pandemic, how they learned online meetings and video recordings etc. Now we are giving online workshops on puppet-making in schools. Prakash Bhat's wife added how she also conducted an online workshop for puppet-making in school.

With the developments in telepresence technology, Kathputli puppeteers may now play for audiences anywhere in the globe virtually. The real-time engagement between performers and viewers is made possible by interactive features paired with high-quality video streaming. But still, it has a long way to go.

8. MOBILE APPLICATIONS FOR LEARNING AND PROMOTION- Social media is a powerful source of communication and promotions, Aspiring puppeteers might benefit from educational materials, tutorials, and virtual workshops offered by mobile applications devoted to Kathputli art. Even modern technology presents new opportunities for artistic expression, cross-cultural interaction, and audience participation in addition to revitalizing the Kathputli art form.

When talking to puppeteers in the cluster or working for the hospitality industry, ask how the people contact you for shows. People contact us through mobile phones. We give our contact numbers to hotels, resorts, and colleges. Even upload the glims of the shows on WhatsApp as a status or Facebook to promote or showcase the shows, and people who see our work contact us for shows.

These apps also function as venues for showcasing Kathputli performances, facilitating the connection between artists and a broader public, and safeguarding the legacy of this age-old art form in the digital era. I observed in the cluster, the young generation is exploring this media, It's a good sign, they are creating their YouTube channel and uploading their videos but very few of them can explore social media platforms such as YouTube, Instagram, Facebook, Twitter, Website, etc. to showcase their art because of lack of education.

7. CONCLUSION

Above mentioned technological advancements are helping to uplift the puppetry art form and to support the community by opening new doors of opportunities. However, it is also important to strike a balance between the advantages and preserving the traditions while integrating technological advancements. Additionally, folk art is carried on by local communities and it must be remembered that technological advancements shouldn't shift the ownership away from them. Artisans and businesses must handle these challenges carefully to make sure that technology enriches rather than lessens the distinctive traits, cultural relevance, and spirit of the puppetry art form. Awareness is important to

understand and to avail the opportunities, this calls for a methodical strategy that upholds tradition while leveraging technology's capabilities for innovation and sustainability.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

The author expresses gratitude towards the puppeteers from the Jyoti Nagar cluster for allowing her to gain insights into their work. We would like to express our gratitude to the souvenir shopkeeper of Badi Chaupad for taking pictures of the products, and we also want to thank Ali Collections for sharing information on the latest market trends for puppets and handicrafts.

References

Khan, Saman, and Meenu Shant Priya. "Change in the ways of promotion and advertising - with reference to Zomato and Swiggy." EDUZONE Research journal, vol. Vol. 11 No. 1 (2022), no. Issue 1, 2022, pp. 8-12. https://www.eduzonejournal.com/index.php/eiprmj/article/view/21.

Chakraborty, Krishnokoli Roy. *an augmented reality animated interactive documentary on craft artists from South Asia*. Thesis. https://openresearch.ocadu.ca/id/eprint/3683/ , https://krishnokoli.format.com/craft-stories.

Kolay, Saptarshi. "Cultural Heritage Preservation of Traditional Indian Art through Virtual New-media." *Elsevier*, vol. Volume 225, 2016, pp. 309-320. *https://www.sciencedirect.com/*, https://www.sciencedirect.com/science/article/pii/S1877042816307157?ref=pdf_download&fr=RR-2&rr=867b1a3c09ede328.

Rikic, Monika. "Interactive Hand Puppets." *YouTube: Home*, https://monicarikic.com/education/interactive-hand-puppets/. Accessed 17 March 2024.

Suman, Avishek. "FOLKLORE AND FOLKTALES: A CINEMATIC TRANSLATION." *Wikipedia*, PROGRESS PUBLICATION CALICUT, https://www.researchgate.net/profile/Saswati-Bordoloi-2/publication/378067964_SEMINAR_ESSAYS_ON_FOLKLORE_Full_Book/links/65c4efc81bed776ae3379f05/SEMINAR-ESSAYS-ON-FOLKLORE-Full-Book.pdf#page=24. Accessed 21 March 2024.

Tillis, Steve. "The Art of Puppetry in the Age of Media Production." *TDR: The Drama Review*, vol. Volume 43, no. Number 3, 1999, (T163). *Project Muse*, https://muse.jhu.edu/article/32948.

Wang, Chao. "Design and Assessment of an Interactive Role-Play System for Learning and Sustaining Traditional Glove Puppetry by Digital Technology." *MDPI*, https://www.mdpi.com/2076-3417/13/8/5206. Accessed 21 March 2024.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 60–65

GEN Z AND SOFT MASCULINITY: EXPLORING PERCEPTIONS AND CONSUMER BEHAVIOR IN FASHION & BEAUTY INDUSTRY

Aditya Mehta[1]

[1] Research Scholar, GLS university

ABSTRACT

In recent years, there has been a notable shift in societal perceptions of masculinity. It is characterised by a departure from traditional masculine norms towards a more inclusive, emotionally engaged, and empathetic approach, also known as Soft Masculinity. Generation Z, born between 1996 - 2010, are the most diverse generation, inclusive, digital natives and known for their strong sense of individuality, social consciousness, and preference for authenticity. Reports have estimated their global spending power of around $4.5 trillion by 2025, making them one of the most significant target group. In contrast, their previous generation, Millennials, commanded over $1 trillion in spending power in 2010. In this zeitgeist, there are market opportunities for fashion and beauty brands to capitalise on growing demand for gender-inclusive and emotionally resonant products. Through a comprehensive, mixed-methods research, this study observed a notable openness towards embracing soft masculinity and beauty-related products traditionally associated with femininity. However, the influence of peer pressure or gender stereotypes appeared to be less pronounced in beauty and skincare domain compared to fashion consumption.

Keywords: Generation Z, Soft Masculinity, Fashion Trends, Consumer Behaviour, Beauty Trends

Corresponding Author

Aditya Mehta,
adityam93224@gmail.com

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1287

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

1. INTRODUCTION

The fashion and beauty industry is a rapidly evolving sector, driven by changing consumer preferences and societal norms. The industry is continually adapting to meet the demands of diverse consumer segments. At the same time, Generation Z also known as Gen Z, which comprises people born between 1996 and 2010 (Patel & Mehta, 2021), has emerged as a strong force within the consumer landscape. Their spending power is expected to be worth over $4.5 trillion by 2025 (Shejale, 2023) . This group is known for their digital fluency, diverse perspectives, and strong sense of individuality. As such, they wield considerable influence over market trends and brand perceptions.

In contemporary society, traditional masculine norms and stereotypes have been deeply entrenched, emphasizing characteristics such as strength, dominance, and emotional stoicism. This historical narrative is evident in depictions of masculinity found in literature, art, and media. Masculinity theories, such as Connell's concept of hegemonic masculinity, offer frameworks for comprehending the construction and perpetuation of dominant forms of masculinity within societal

structures while acknowledging the diversity and fluidity of masculine identities. However, societal transformations, including feminist movements and evolving gender roles, have catalyzed the emergence of alternative concepts such as Soft Masculinity. This paradigm shifts challenges traditional notions of masculinity by embracing qualities like empathy, vulnerability, and emotional expression.

Soft Masculinity signifies a departure from rigid, traditional masculine norms, embodying a more inclusive, emotionally engaged, and empathetic approach to gender expression. It finds its roots in various cultural movements, including the men's liberation movement of the 1970s and contemporary dialogues surrounding toxic masculinity and gender equality. The men are in continual transformation, that takes time and effort. (Lorello, 2019)

It advocates for a redefinition of masculinity as multifaceted and fluid, empowering men to express a broader spectrum of emotions and behaviors without fear of societal judgment or condemnation. we can observe that the a softboy, someone following soft masculine traits, has been divided into numerous sub-genres, each with somewhat different characteristics and behaviours. (David, 2019)

Sun Jung has introduced that the concept of soft masculinity popularized by the Korean Wave (AZIZAH & DWIYANTI, 2021). K-pop idols perform characteristics where masculinity is purposefully "watered down" for a more relatable, egalitarian image.by having softer appearances, child-like behavior, and more emotionally expressive personalities (Sihan , 2023). In the United States, softboy culture has become highly influential and pervasive, exerting a significant impact on mainstream societal norms, values, and behaviors. America's pop culture, much like its politics, is undergoing a hard split, with the music charts largely ruled by R&B acts and softboy-leaning pop artists (Robertson, 2021). This trend is emerging around the world and one can be influenced by this even if geographically not close to it. Looking beyond the internet into mainstream culture, attitudes to gender are changing and that's impacting the way men see themselves. (WGSN, 2021)

Generation Z represents the most diverse generation to date, characterized by a strong emphasis on individuality, social consciousness, and inclusivity. Raised in the digital age, members of Generation Z exhibit fluency with technology, social media proficiency, and a preference for authentic, socially responsible brands. They prioritize diversity, inclusivity, and sustainability in their consumer choices, often gravitating towards brands that resonate with their values and beliefs.

The explorative journey towards self-discovery and identity formation initially unfolds within the realm of aesthetics, where young individuals, both men and women, embark on a multifaceted exploration of their identities by transcending conventional boundaries. Through this process, they envision themselves embodying diverse gender and cultural identities concurrently. These endeavors extend beyond mere aesthetic experimentation, serving as catalysts for initiating transformative shifts within cultural hegemony. (Iida, 2006) Soft masculinity embraces qualities such as emotional intelligence, empathy, and inclusivity. As a result, it resonates deeply with Gen Z's values of authenticity and social consciousness.

Existing literature suggests that Soft Masculinity can exert influence on consumer behavior by challenging traditional gender norms and broadening the scope of products and experiences deemed acceptable for men. Studies indicate that individuals adhering to more traditional masculine norms may exhibit lower propensity to engage in certain consumption behaviors, such as purchasing beauty or self-care products.

Globally, this trend has already penetrated the market and used for commercialisation. Cosmetic and skincare giants, like Estee Lauder and L'Oréal are responding to the growing demand with a litany of grooming products targeted towards men (Lim, 2018). The Korean beauty and skincare market customized for men was estimated to gain 1.19 trillion KR₩ in 2018. A recent survey in Korea suggests Gen Z is more open to men openly wearing makeup (Lee, 2018). British men now spend more on grooming products and treatments each month than women (Barclays Consumer Spend Index, 2017)

Despite burgeoning interest in Soft Masculinity as a cultural phenomenon, a notable gap exists in research exploring its impact on Generation Z consumer behavior within the fashion and beauty industries in India. This paper aims to explore the intersection of soft masculinity, fashion, and beauty within the context of Indian Gen Z consumers.

2. METHOD

This study was conducted using mix method research via surveying respondents who identify as Gen Z male. The questionnaire was prepared to test the qualitative and quantitative aspects of this research, and was circulated online using convenience sampling technique. Measurable data was gathered through questions on personal income, spending on clothing, accessories, and grooming products to analyse the quantified patterns. Qualitative insights were also gathered on their perception of masculinity, awareness, perceived reactions and individual attitudes. Since, the attention

span of the target cohort group is short, the questions were accompanied with fun, interesting GIFs and few trap questions were asked to check if the respondents read the questions or not. In total, 110 Gen Z male filled the survey, out of which Five were identified as random responders and their responses were nullified.

3. RESULTS

DEMOGRAPHIC DATA

From 105 respondents, 40%are aged between 18-21years, 37.1% aged between 26-28 years and 20.9% were between 22-25 years. 77.1% respondents were from Tier1 cities in contrast to 8.6% from Tier 3 cities in India. For their current occupation, 45.7% are working professionals, followed by 42.9% of students pursuing bachelors and 2.9% were entrepreneurs. Since, Gen Z is digital native, and born in the age of internet (Fromm & Read, 2018), their Social Media usage was on the higher side. 28.6% respondents use social media platforms for more than four hours a day in striking contrast to just 8.6% respondents using social media less than an hour.

PERCEPTIONS ON MASCULINITY AND GENDER ROLES:

As we see the shift in overall concept of gender and its assigned roles and characteristics, this research also aimed to understand the perception of Gen Z on this theme. For the study, the list of characteristics are taken from literary works of Michael Kimmel and Judith Butler but also reflect common societal beliefs and expectations that have been culturally ingrained over time. On asking the traditional characteristics that define masculinity, Independence and self- resilience was highest with 68.6% responses, followed by protectiveness, strength and toughness, assertiveness and leadership and others as shown in figure 1 below.

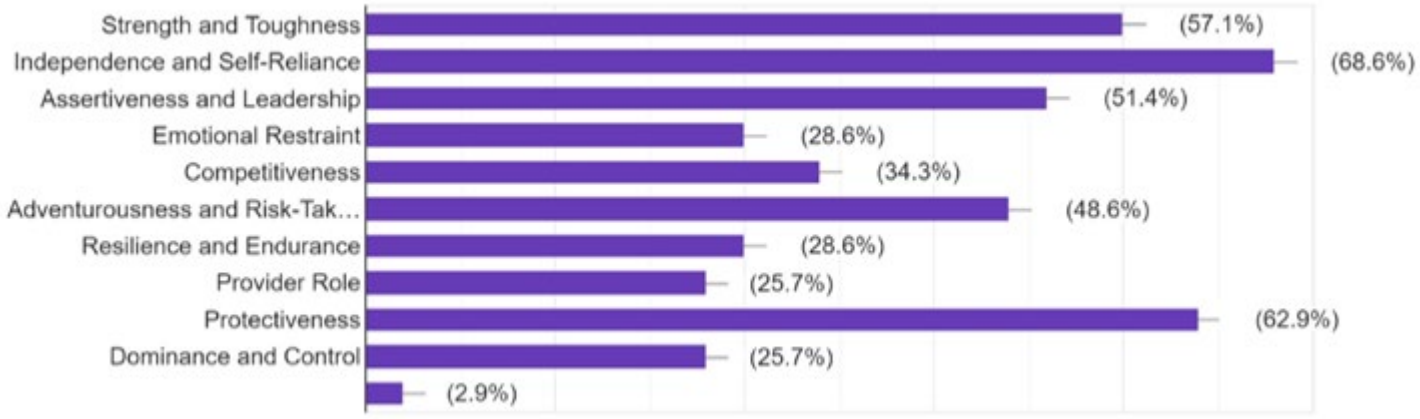


Figure 1 Traditional Masculine traits as per the respondents

25.7% respondents strongly felt that they don't match up to all the traditional traits, and more than 60% of them have felt pressure to conform to these traditional masculine norms where as 40% feel that these norms are outdated and not relevant in today's time with 37.1% respondents feeling that these norms are toxic. 67.7% of respondents who feel or sometimes feel traditional masculine traits are toxic rate Soft Masculinity positively

In contrast, when asked for their understanding of traditional feminine characteristics, traits such as Nurturing and caregiving, sensitivity and emotional expressiveness, patience etc. were selected the most as shown in the figure 2 below.

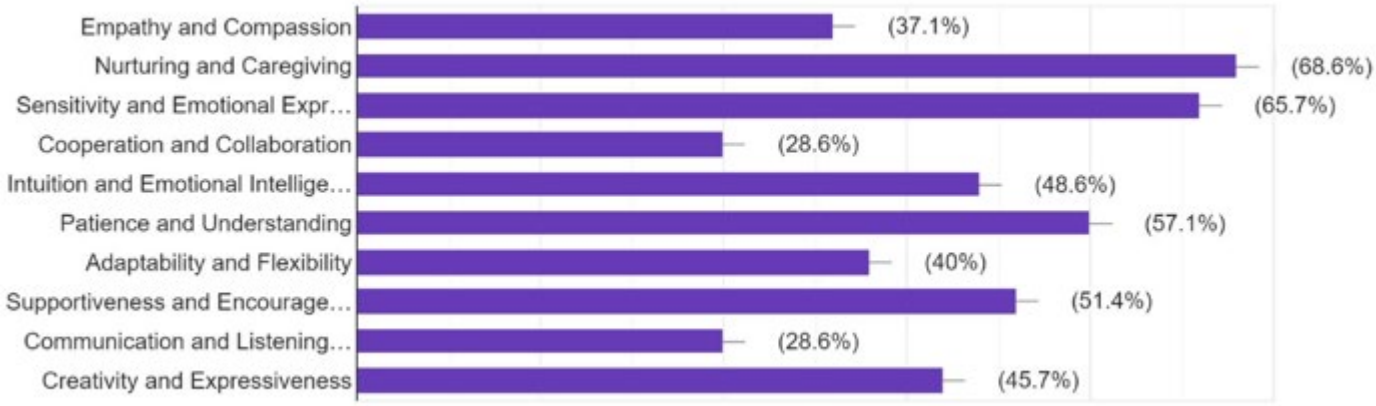


Figure 2 Traditional Feminine traits as per respondents

PERCEPTION ON SOFT MASCULINITY

From the total respondents 57.1% have not heard the term "soft masculinity" before the survey, out of which 48% considered it a positive and welcoming change, with 80% of total respondents felt that it is a positive trend for men's mental health. Furthermore, 84% of older Gen Z showed more acceptance of the soft masculinity and only 31% of Gen Z between age 22-25 thought soft masculinity as a welcoming change.

At the same time, 10% of the respondents felt that the men in their surroundings will reject this concept. 17.1% of respondents also felt that using term "Soft Masculinity" actually reinforces the gender stereotypes. More than 83% felt that they'll be teased or stereotyped for following soft masculinity traits by the men in their immediate circle.

SOFT MASCULINITY AND FASHION CONSUMPTION

On an average, 80% of the respondents have spent more than ₹3000/- on clothing in last six months, and 88% are comfortable in expressing themselves through clothing. This cohort group is highly active on social media as mentioned earlier, social media platforms were ranked first for their fashion inspiration, followed by popular media, friends and at the end family members as shown in figure 3 below. 37.1% of the respondents have been following social media influencers who practice or promote soft masculine fashion.

When it comes to shopping clothes which are traditionally associated with feminine look, 40% have already purchased something from the opposite gender section and 37.1% are willing to shop if it is not overpowering. But given a choice, only 40% will spend money on clothing ad accessories associated with soft masculine fashion and 37.1% would only spend less that ₹1000/ on soft masculine fashion, out of which, majority were from the age group of 18-21. Gen Z aged 26-28 showed willingness to spend more money on soft masculine fashion compare to other age groups, clearly showing their purchase power and individualistic choices. It was noteworthy, that 37.2% felt that men in their immediate circle with criticize them for sporting a soft masculine fashion.

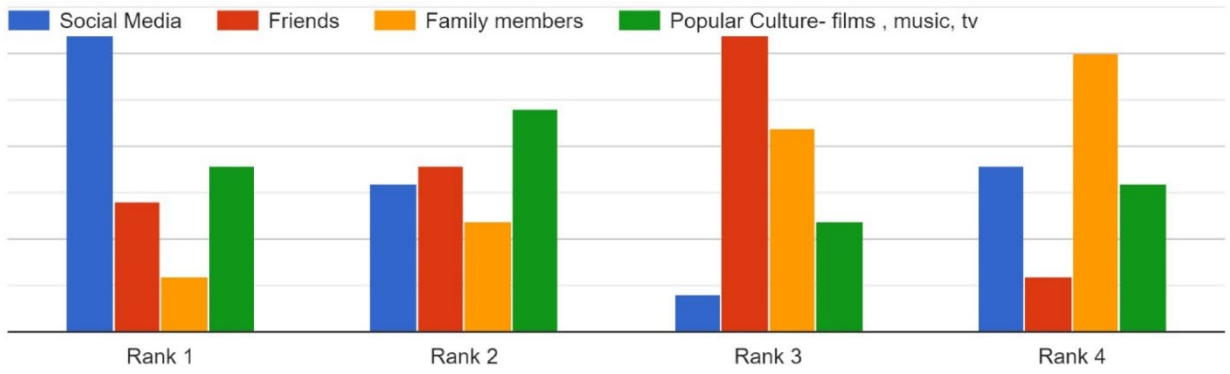


Figure 3 Source of fashion inspiration for Gen Z

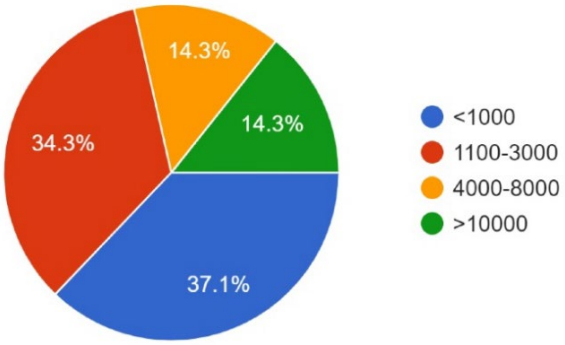


Figure 4 Willingness to spend money of soft masculine fashion

SOFT MASCULINITY AND GROOMING/ BEAUTY CONSUMPTION

When it comes to the grooming and beauty related consumption in Gen Z men, the results were quite positive. For 82.9% respondents their grooming was important. In last six months, 14.3% spent more than ₹10,000/- on their grooming and beauty products, while only 20% spent less than ₹1,000/-. These products were mainly related to hair and facial hair, fragrance and skincare followed by intimate care and nail care at the end.

It was also observed that the awareness of skincare/ beauty products has increased in this cohort group, as 62.9% respondents are aware of various skincare products available in the market and 65.7% have also used them in some or other way. More than 60% respondents are willing to spend money on these skincare/beauty products with 5.7% respondents willing to spend more than ₹10,000/- as shown in figure 5 below.

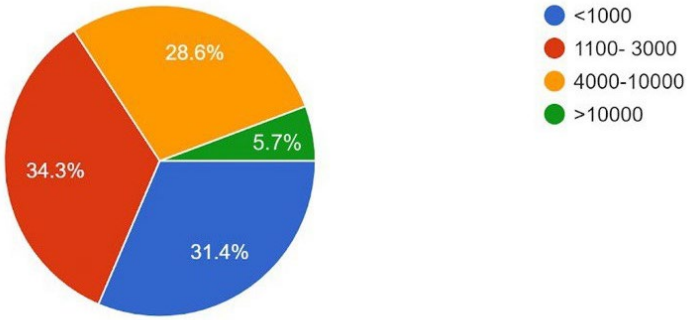


Figure 5 Willingness to spend money on beauty and grooming products

In contrast to the soft masculine fashion consumption, 68.6% respondents had men in their immediate circle using these products. Also, the peer pressure or gender stereotypes were not influenced while using these products. When it comes to using these products which are traditionally associated with women, 37.1% of them felt it neutral and 48% felt it irrelevant, meaning they would all try the products. Only 14% respondents felt that the men in their circle would not approve of them using skincare/ beauty products. From all the respondents willing spend more than ₹4000/- on skincare and grooming products, 50% respondents were of age 26-28, again showing their financial independency.

Although, 54.2% respondents would highly purchase beauty/ skincare related products, if they were promoted, featured and referred by men. This also reflects on the way marketers are changing their communication. The cosmetic industry in South Korea was dominated by women that shows preference towards women ambassadors, but there has been a recent trend in the industry to feature male K-Pop idols as the brand ambassador.

Younger Gen Z in age 18-21 are heavily influenced by social media and popular culture in their fashion and grooming choices and are more experimental and open to blending traditional and modern traits of masculinity. Whereas, older

Gen Z in age 26-28 have shown a more varied spending pattern, with 30% willing to spend more than ₹10,000,suggesting a higher disposable income or greater interest in soft masculine/gender-inclusive styles within this group.

4. CONCLUSION

The concept of "soft masculinity" emerged as a relatively new term for many respondents, with varying perceptions of its significance. While a significant portion viewed it positively, associating it with improved mental health for men, there was also apprehension regarding acceptance from peers and the reinforcement of gender stereotypes. This reflects the complexity of navigating evolving gender norms and the challenges associated with changing traditional perceptions of masculinity.

Regarding fashion consumption, social media played a pivotal role as the primary source of inspiration, particularly for soft masculine fashion. Despite a willingness to explore clothing traditionally associated with the opposite gender, there was hesitance in fully embracing soft masculine fashion, with concerns about peer criticism and societal norms.

In contrast, grooming and beauty consumption among Gen Z men showed a more positive trend, with a majority considering grooming important and expressing willingness to spend on skincare and beauty products. The increased awareness and usage of skincare products signify a shifting attitude towards self-care and personal grooming among men. Importantly, the influence of peer pressure or gender stereotypes appeared to be less pronounced in this domain compared to fashion consumption. The study highlights the challenges faced by Gen Z individuals in navigating evolving gender norms and consumption practices while also presenting opportunities for businesses and marketers to cater to changing preferences and attitudes.

The data indicated that Gen Z males are increasingly embracing soft masculinity and gender-inclusive fashion due to a combination of exposure to new trends, the influence of social media and celebrities, changing attitudes towards traditional masculinity, and a growing focus on personal expression and self-care.

As a future direction, this study can be taken further through longitudinal study to assess the impact of soft masculinity trend on Gen Z also a cross-cultural study can take place to understand the impact of socio-cultural factors on gender perceptions and consumption patterns.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

None

REFERENCE

Iida, Y. (2006). Beyond the ‘feminization of masculinity’: transforming patriarchy with the ‘feminine’ in contemporary Japanese youth culture. Inter-Asia Cultural Studies.

Lorello, J. A. (2019). DISRUPTING MASCULINITY AND PATRIARCHY: STORIES OF MEN. Dissertation, Greensboro.

AZIZAH, N., & DWIYANTI, A. (2021). South Korea in Reconstructing Masculinity as Brand Image of the State’s Economic Diplomacy. SOCIOLOGÍA Y TECNOCIENCIA.

(2017). Barclays Consumer Spend Index. Barclays Consumer Spend Index.

David, I. (2019, August 22). Vice.com. Retrieved February 2024

Fromm, J., & Read, A. (2018). Marketing to Gen Z: the rules for reaching this vast and very different generation of influencers. New York: Amacom.

Greene, J., Bone, I. (2007). Understanding neurology: A problem-oriented approach. CRC Press.

Lee, S. (2018, November 12). The Jakarta Post. Retrieved February 2024

Lim, L. (2018, November). Augustman.com. Retrieved February 2024

Patel, A., & Mehta, A. (2021). Gen Z reshaping the Streetwear Sneaker Market. GLS Kalp.

Robertson, D. (2021, October). Politico.com. Retrieved February 2024

Shejale, P. (2023, July 18). https://timesofindia.indiatimes.com/. Retrieved February 2024

Sihan, L. (2023). The Research on the Portrayal of Soft Masculinity by K-pop. The International Conference on Interdisciplinary Humanities and Communication Studies.

WGSN. (2021, October). How a new generation is challenging masculinities and redefining identities. WGSN.

Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
International Conference on Emerging Trends in Design and Arts
May 2024 5(ICETDA24), 50–59

TIMELESS DESIGN EMBRACING SUSTAINABILITY THROUGH BRAND COMMUNICATION STRATEGIES: A STUDY OF INDIAN APPAREL BRANDS

Nachiket Jaywant Ahiwale[1], Dr. Hemant Kaushik[2]

[1] Visual Communication Design PhD Scholar, Avantika University, Vishwanathpuram, Lekoda, Madhya Pradesh, 456006, MIT Institute of Design at Indore
[2] Visual Communication Design, Avantika University, Vishwanathpuram, Lekoda, Madhya Pradesh, 456006, MIT Institute of Design at Indore

ABSTRACT

Sustainability goes beyond the label. It's not just a green logo stamped on a product, but a deep commitment woven into the fabric of a brand, reflected in the actions behind the scenes. However, it reflects how the brand communicates its identity in the domestic and international markets to sustain its identity in a longer race in response to other competitive brands. The textile industry in India is a true powerhouse, employing millions and housing a massive number of companies, both large and small. Indian celebrity apparel brands such as Rheson by Sonam Kapoor and Indian apparel brands such as Patanjali Paridhan and Craftsvilla are successful in terms of initial launch but later end up in terms of brand growth due to a lack of brand communication and brand strategy. Whereas other brand products, such as Jaypore, Raymond, and Fabindia, can create an impact in terms of brand growth by combining motion graphics, artificial intelligence, cinematography, powerful visual merchandising, 3D art installations, and the art and power of storytelling to promote the identity of different products through different visual elements that speak about the product's functionality. The purpose of this research paper is to build the brand product category's emotional relationship with the user, extend the product's lifespan in the customers hearts, and promote brand identity.

Corresponding Author

Nachiket Jaywant Ahiwale,
nachiket.ahiwale@avantika.edu.in

DOI
10.29121/shodhkosh.v5.iICETDA24.2024.1265

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

1. INTRODUCTION

Visual communication is the brush that paints a brand's story, captivating hearts and minds. A picture tells a thousand words, and in branding, it tells one powerful story. From logos to campaigns, effective visual design is the foundation of successful brand conversion [2]. By appealing to emotions and evoking experiences, visual design fosters brand loyalty and engagement. Powerful visuals translate across languages and cultures, turning brands truly global citizens. Visuals are the window to a brand's soul, revealing its values and personality. Visuals speak volumes, but design speaks languages. Beyond the picture, design bridges words and emotions. Don't just see it; feel it: design is the silent conversation [9]. Think of design as the magic wand that transforms words into a brand that resonates. Beyond just

looking pretty, visuals are the bridge connecting brands with their audience. Visuals are the voice, branding is the message, and design speaks volumes, building brands that last.

The Power of Pixels Visual communication in the apparel industry is the silent salesman. It's the emotional trigger that turns heads, sparks desire, and ultimately drives sales. Designers need to be trained in research and user-centred thinking, not just aesthetics and self-expression. The goal of design shouldn't be mere artistic expression but solving user problems and creating meaningful experiences. [12]

Data, research, and methods don't stay within borders; designers have always been open to cross-disciplinary collaboration. Design isn't a silo; it doesn't operate in isolation. Since the beginning, designers have drawn inspiration and methods from across disciplines. [5]

Storytelling through Sight: Clothes are more than just fabric; they're statements of identity and aspirations. Visual communication tells the story behind your brand, its values, identity, and the emotions it evokes. Think compelling photography, evocative videos, and on-point graphics that showcase the lifestyle your apparel represents.

Building Emotional Connections: People connect with visuals on a visceral level. Powerful imagery creates desire by showcasing the fit, texture, and movement of your garments. Think high-quality product shots, engaging lifestyle images, and emotional storytelling that resonates with your target audience.

Standing Out in a Crowded Market: The apparel industry is fiercely competitive. Visual communication helps you cut through the noise and differentiate your brand. Think unique colour palettes, innovative layouts, and consistent brand identity across all platforms.

Beyond Aesthetics: Building Trust: Visuals can build trust and credibility. Showcasing sustainable practices, ethical sourcing, and diverse models through your visuals fosters a connection with conscious consumers.

2. LITERATURE REVIEW

The design world is shifting. Today, just being great at creating visually stunning work isn't enough. Companies are seeking designers who wear multiple hats, combining their visual communication skills with a keen understanding of design marketing strategies. This fusion of aesthetics and strategy is paving the way for a more human-centred approach to design, often referred to as human-centred design (HCD) [4] [11]. As globalisation opens doors and technology changes the game, the fashion industry needs designers who understand business, not just trends. From sketches to spreadsheets, the new era of fashion demands designers who think beyond the runway and who are no longer just artists but business architects too. Many design professionals are experiencing this firsthand, facing limitations in their careers due to a lack of additional skillsets. To meet the demands of the modern world, they're taking a bold step: returning to school, not for more design but for knowledge in entirely different dimensions. Design professionals are enriching their skillsets with areas like business and marketing, economics, anthropology, and world cultures [6]. Disneyland, like many places, can be seen in different ways. In the real world, it's a business that provides services, just like a restaurant or a store. However, for many people, it's more than that. It's a land of dreams, stories, philosophies, fantasies, and hopes where everything seems perfect and free from the problems of the real world like crime, prejudice, decay, violence, pain, discontent, abuse, racism, and sexism. This ability to create and sell these dreamlike experiences is a big part of Disneyland's success through "story manufacturing and story commoditization [1].

3. GATHERING INFORMATION AND RESEARCH APPROACH

This study uses an interview-based research design. This approach allows for the analysis of the subjective opinions and experiences of the respondents. Participants were carefully selected from the fields of visual communication design and related areas to ensure relevant insights.

1) Be a passionate design student or design enthusiast, eager to delve deeper into the world of brand communication.
2) To fully grasp the nuances explored in this programme, participants are encouraged to have some prior exposure to brand communication strategies in the apparel industry.

Table No 1

S.no	Biological Sex	Adulthood	Occupation	Sovereignty
A]	Female	22	Film Cinematographer {Visual Communication Design Student}	Telangana
B]	Female	24	Film Editor	Odisha
C]	Female	21	Sound Designer	Rajasthan
D]	Male	35	Adverting Director {Visual Communication Design Student}	Meghalaya
E]	Male	21	3D Art Installation Designer	Madhya Pradesh
F]	Male	34	Motion Multimedia Developer	Maharashtra
G]	Male	18	Colour Designer	Gujrat
H]	Male	24	Artificial Intelligence Tool Developer	Delhi
I]	Male	18	Visual merchandiser and Graphic Designer	Karnataka
J]	Male	24	Advertising Copywriter {Visual Communication Design Student}	Uttarakhand
K]	Female	21	Catchy Commercial Jingle Maker {Visual Communication Design Student}	Tamil Nadu
L]	Male	25	Exhibition Designer	Uttar Pradesh
M]	Male	22	Lyricist and Voice Artist	Jammu Kashmir
O]	Female	23	Set Designer	Himachal Pradesh
P]	Male	22	2D 3D Animator Animation Student {3D Clothing Technology}	West Bengal
Q]	Female	22	Creative Designer and Photographer WGSN {Worth Global Style Network}	Amravati
R]	Female	24	Immersive Media Virtual Reality Designer {Apparel VTO Technology}	Punjab
S]	Male	22	Fashion and Textile Design Student	Jharkhand
T]	Female	21	Speculative Designer	Manipur
U]	Female	19	Design / Creative Director {Futuristic Design Trend Forecaster}	Kerala

The author picked the people for the interviews themselves. This might be a problem because they don't know much about brand communication strategies, especially for designers from different domains in terms of branding for the

Indian apparel industry. It was first ensured that design students were made aware. The process involved conducting seven virtual lectures each week. In addition to the lectures, a four-day intensive workshop was offered to provide a comprehensive understanding of brand communication strategies in the apparel industry. Following the selection process, interviews were conducted with 40 participants identified as meeting the established criteria. These participants included 20 visual communication designers and 20 design students. The interviews aimed to gather valuable new insights, ensuring an adequate sample size for the study. The interviews were stopped once theoretical saturation was achieved, indicating no further new insights would be gained from additional interviews [13]. While some studies suggest theoretical saturation may be achieved with as few as 12 participants in homogenous groups, this is not a universal rule [3]. Through the continuous efforts, 40 participants were identified to form a homogenous group within the age range of 20 to 35 years. The study involved participants from diverse geographical locations. Gender representation was balanced, with 11 participants identifying as male and 9 as female. Interviews were conducted virtually, using both English and Hindi, and each lasted roughly 30 minutes. To support the qualitative analysis and to ensure its validity and trustworthiness, the researchers utilised the software programmer NVivo Pro 12.

4. RESEARCH FINDINGS

Following in-depth conversations with the participants, valuable gems of information have been unearthed, which have been organised as follows:

4.1. BEYOND GREENWASHING, CREATING AWARENESS, AND REVEALING AUTHENTIC BRAND COMMUNICATION SUSTAINABILITY STRATEGIES

Navigating any practice requires a clear map. While numerous resources offer guidance, the journey begins with recognising their presence. In the course of this study, the writer interviewed branding designers from various visual communication design industries to explore their perspectives on sustainable and authentic brand communication strategies within the Indian apparel industry. However, a surprising lack of awareness regarding these strategies was discovered. Following the communication of key information, the same group advised that both understanding and acting are essential in this situation. For example, a 24-year-old visual merchandiser and graphic designer expressed that I used to unknowingly waste energy, but with new knowledge about WGSN, I'm actively spreading awareness to prevent others from doing the same. This statement emphasises that Indian designers now understand their responsibility to let others know that WGSN (Worth Global Style Network) offers global perspectives and understands the importance of cultural relevance. They don't simply tell Indian designers to copy the West. Instead, it offers trend reports and analysis that can be adapted to suit Indian sensibilities and aesthetics. Its trend forecasting empowers Indian apparel brands to make strategic design decisions for fashion-conscious consumers.

For example, a 22-year-old male bachelor of fashion and textile design student said the bootcamp really helped them learn about virtual reality for improved product marketing and storytelling, as well as personalised shopping experiences as in virtual showrooms and customisation options, while at the same time enhancing design and development through virtual prototyping. This statement emphasises that Indian designers now understand their responsibility to let others know that immersive brand experiences and VR can offer Indian brands a powerful tool to tell their stories and showcase their collections in a captivating and interactive way. This can lead to increased brand engagement and emotional connection with consumers. Virtual fashion shows: VR can revolutionise fashion shows, allowing audiences from all over the world to experience them virtually, breaking geographical barriers, and increasing accessibility. VR allows designers to create and iterate on clothing designs in a 3D virtual environment. This fosters faster experimentation, reduces physical sample production costs, and enables designers to visualise garments in a more realistic way.

Another 21-year-old girl visual communication design professional native of Tamil Nadu expressed that she gained new aspects of branding through this workshop, namely that speculative design can become a catalyst for innovation in the Indian apparel industry, which focuses on innovation and differentiation, sustainability challenges, building brand identity, and at the same time balancing innovation and wearability as well as consumer acceptance. This statement emphasises that by exploring uncharted territories, speculative design can lead to groundbreaking ideas, materials, and garment functionalities. Such as self-repairing garments that mend tears or adjust to temperature changes. Clothing integrated with technology for health monitoring or augmented reality experiences. Garments grown from biomaterials or made from recycled waste. This eventually leads to the brand's commitment to progress and social responsibility.

4.2. RESPONSIBLE FACTORS THAT WILL LEAD TO IMPACTFUL AUTHENTIC BRAND COMMUNICATION SUSTAINABILITY STRATEGIES

Without accurate information, the essential factors for authentic, sustainable, and impactful brand communication strategies cannot be assessed based on which end user, the consumer, makes decisions and purchases products. To summarize previous research, 10 key points were identified. These points were presented to participants, and their opinions were collected. Table 2 organizes their responses based on how widely accepted each point was. The data in this table reveals the agreement levels of visual communication professionals and undergraduates concerning the issues raised. A lot of people who took part thought that bridging the lines between physical and digital retail, using eye-catching focal statements, and not using false advertising are essential. A lot more people who answered the question said yes to the idea that global activation 3D art installations, signature taglines, minimalist visuals that capture customer attention, contrast and tones, light and shadows, storytelling through visuals and making use of immersive digitalization (VTO), the art of creating captivating pop-up spaces, and the use of 2D 3D animation {3D clothing technology} are also the most significant factors that will lead to impactful authentic brand communication sustainability strategies.

Table No. 2

Factors	N	%
Creating proper brand desire via Motion Graphics	2	10
To create desire, force, art, mystery, to evoke sensation, appealing texture, liquid splashes, and to show how the brand is vibrant.	2	10
Global Activation via 3D Art Installations, Signature tagline, Minimalist visuals that captures customer attention, Contrast and Tones, Light and Shadows, Storytelling through visuals.	3	15
Making use of Immersive Digitization Virtual Try-on (VTO), the art of creating captivating pop-up spaces, and the use of 2D 3D Animation {3D Clothing Technology}	3	15
Bridging the lines between physical and digital retail, using eye-catching focal statements, and not using false advertising.	3	15
WGSN {Worth Global Style Network}, Speculative design as catalyst for innovation	2	10
Social Media Influence - Borderless Experiences, International Intervention	1	5
Extensive brand experience in the visual merchandising and retail display industry, creating surrounding hues that will give a vibrant look for product in its display	1	5
Advertisement with better Film Cinematography, Lyricist, Voice Artist, Set Design, Catchy Commercial Jingle	2	10
Elements with high recall ability deserve emphasis.	1	5

Table No. 2 N refers to the number of participants.

After these points, the need for WGSN, {Worth Global Style Network}, speculative design as a catalyst for innovation in the Indian apparel industry has been recognised as a noteworthy driver by visual communication designers and undergraduates. Visual communication professionals expressed that advertisements with better film cinematography, lyrics, voice artists, set design, catchy commercial jingles, and creating proper brand desire via motion graphics were influential factors in communicating brand identity. Professionals and undergraduates cannot summon any clear perspectives from attendees, suggesting an impartial response. To create desire, force, art, mystery, to evoke sensation, appealing texture, liquid splashes, and to show how the brand is vibrant; social media influence—borderless experiences; international intervention; extensive brand experience in the visual merchandising and retail display industries, Creating surrounding hues that will give the product a vibrant look on its display was crucial to addressing these minute details for this specific case.

4.3. DESIGN MEMORABILITY

Professionals and undergraduates cannot summon any clear perspectives from attendees, suggesting an impartial response for design memorability beyond greenwashing, creating awareness, and revealing authentic brand communication sustainability strategies. While driving quick sales is attractive, impactful brand communication goes beyond that. It should also strive for powerful visuals. Effective visuals as well as advertising trigger cognitive responses in viewers, and the clarity of its message directly influences how well it is remembered [7]. Effective ad design seamlessly integrates visual elements that promote recall, making its importance undeniable. Opinions on the visual communication design elements for the Indian apparel industry were split. An equal number of respondents agreed and disagreed. A 21-year-old visual communication design student (a male respondent) disagreed, stating, I don't believe the recall element would be effective for global activation using 3D art installations for Indian apparel branding. Recalling the installation requires the audience to put in double the effort, hindering its effectiveness.

Another 23-year-old visual communication design professional considers design memorability to be crucial for impactful visuals when it comes to brand communication that guarantees increasing the brand desire, force, art, mystery, evoking its sensation, appealing texture, liquid splashes, and communicating that the brand is vibrant. Research has conclusively shown that the primary factor behind a brand being globally successful is advertisement with better film cinematography, lyrics, voice artist, set design, catchy commercial jingle with other design elements like global activation via 3D art installations, signature tagline, minimalist visuals that capture customer attention, contrast and tones, light and shadows, and storytelling through visuals. Print and television advertising: strategic use of print magazines and television commercials can reach a wider audience, especially in regions with lower internet penetration. Browse Machine Refinement: Refinement of Internet sites and virtual information to stand above in browsing machine findings. This will make the brand more discoverable for potential customers searching for Indian apparel. Collaborations: Partner with established designers, celebrities, or trendsetters to produce exclusive version treasures or mobilize their extend and influence.

The design industry is facing a new reality: a world overflowing with information that is instantly accessible. Gone are the days of simpler times, when globalization and a rapidly evolving market weren't factors. Today, complexity and professionalism are essential across all industries. As a result, driven by this intricate web of factors, including globalization, the design industry now finds itself needing to draw on knowledge from other disciplines to ensure its long-term success in the global marketplace. [8]

Community Engagement: Support local communities and causes to build brand loyalty and positive brand association. Experiential Marketing: Create interactive pop-up shops, workshops, or events to engage with customers and build a brand experience.

CEOs, COOs, CFOs, business heads, presidents, directors, brand masterminds, publicity investigators, architects, and creative minds are increasingly recognizing the value of storytelling as a communication tool [10].

Lessons for companies after Patanjali's slowdown

Patanjali's Clothing Brand Paridhan: A Story of Rapid Rise and Decline

No brand has ever experienced such a meteoric rise and then crashed so spectacularly in just three years. Patanjali, a former powerhouse of the domestic production movement under Baba Ramdev, has faced some roadblocks. It's worth examining the potential reasons. Patanjali diversified its product portfolio in 2016 with the introduction of Patanjali Paridhan, a brand offering apparel for all ages. By attempting to be everything to everyone, the brand loses its unique appeal and fails to resonate with any specific audience. Patanjali's rapid launch of numerous brands outside its core offerings has strained its resources and diluted its brand identity, leading to brand confusion and confusing consumers. A brand shouldn't be everything to everyone. Trying to be like a supermarket, selling everything from jeans to ghee, can be a recipe for brand confusion. The Advertising Standards Council of India (ASCI) has repeatedly flagged Patanjali Ayur-Ved for misinformation in promotional content for various products, including hair serum, plant-based wash, makeup, dessert, kitchen cleaning bars, and freshly squeezed beverages. Patanjali appeared to prioritize short-term gains over

building long-term brand trust. This was reflected in their marketing practices, with numerous complaints filed with ASCI regarding misleading or unsubstantiated claims in their advertisements.

Potential Factors for Decline:

Brand Diversification: Patanjali rapidly expanded into diverse categories like clothing, potentially diluting its brand identity and confusing consumers.

Marketing and Advertising: Concerns arose regarding the accuracy of claims made in Patanjali's advertising for various products, including clothing. This could have eroded consumer trust.

Long-Term Strategy: Some experts suggest Patanjali may have lacked a clear long-term vision for its clothing venture, leading to challenges in sustaining growth and addressing evolving market dynamics.

Inconsistent Products, Casual Branding, and Visual Merchandising

Brand with better visual merchandising, for example, the successful Indian brand Jaypore.

5. CONCLUSION

Visual communication designers, alongside other professionals, require delicate handling, understand their responsibility in communicating the brand identity in a proper way, and actively seek ways to provide impactful, authentic brand communication sustainability strategies. Designers typically avoid personal environmental advocacy in their work. However, their role in social and environmental campaigns is crucial. They ensure the design and message seamlessly align with the campaign's objective of promoting environmental sustainability. There's a disconnect between the product's physical manifestation and its potential to communicate environmental messages or delve into specific subjects. As advertising and product creation continue to flourish, visual communication designers have a crucial opportunity and responsibility to ensure the design and production processes are environmentally responsible. Given the growing concern for environmental impact, it's crucial to address the designer's role and responsibilities in crafting authentic brand communication sustainability strategies. This exploration will outline three key areas for integrating environmental considerations into the design process: (i) Creating awareness and revealing authentic brand

communication sustainability strategies, as well as building trust; (ii) Integrating Responsible Design Principles; and (iii) Recall: Creating Memorable and Impactful Communication.

(i) Visual communication designers and fashion innovators are unaware of the global brand-building potential and brand growth by rescaling the brand artwork. Hence, Colleges of art and design, publicity studios, and market research analysts shall consider running programs revealing authentic brand communication sustainability strategies for their environmental responsibilities and global brand growth.

(ii) The identified responsibilities as well as responsible design principles are bridging the lines between physical and digital retail; use of eye-catching focal statements; and not using false advertising, which will be impactful in brand communication sustainability strategies. However, fewer respondents have expressed that making use of Immersive Digitization Virtual Try-On (VTO), the art of creating Captivating Pop-Up Spaces, the use of 2D 3D Animation {3D Clothing Technology}, as well as global activation via 3D Art Installations, signature taglines, minimalist visuals that capture customer attention, contrast and tones, light and shadows, and storytelling through visuals plays a significant role. Also, visuals capture customer attention. Creating proper brand desire via motion graphics as well as speculative design as catalysts for innovation has a significant role.

(iii) Despite there was a nonpartisan answer on the design memorability in creating awareness and revealing responsible factors that will lead to impactful authentic brand communication sustainability strategies, research has indicated that bridging the lines between physical and digital retail, using eye-catching focal statements, and not using false advertisements are the most effective ways to enhance brand image, in addition to other factors that are mentioned in Table 2, which will play an important role in growing the brand globally. Hence it is feasible by the design memorability of the visual communication industry for its application in the Indian apparel industry. So this design memorability should be incorporated through visual communication branding designers, fashion designers, and the Indian apparel industry too.

Since many globally successful Indian apparel brands have already taken the steps to make use of these impactful authentic brand communication sustainability strategies, for example, brands like Raymond, Mufti, Rare Rabbit, Fabindia, and Jaypore are making use of these strategies to make their brand have a global presence. where other unsuccessful Indian brands like Patanjali Paridhan, Craftsvilla, and Rheson need to take serious steps to make their brand globally successful by making use of these impactful authentic brand communication sustainability strategies.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

None

REFERENCES

Boje, D. M. (1995). Chronicles of narration association : A postmodern analysis of Disney as “Tamara-Land”. Academy of Management Journal, 38(4), 997-1035.

Ford, J. (2004, Feb). Design for global appeal. Global Cosmetic Industry, 172, 36-37.

Guest, G. Bunce, A. Johnson, L. (2006). How Many Interviews Are Enough ? An Experiment With Data Saturation And Variability. Field Methods, 18(1), 59-82.

Jordan, P. W. (2002). Human factors for pleasure seekers. In J. Frascara (Ed.), Design and the social sciences: Making connections (pp. 9-23). London: Taylor & Francis Inc.

McCarron, C. (2000). A Mater of Degrees: The Ph.D. in Design. Communication Arts. Available: [2005, 20 Jan].

McCarron, C. (2003). Expanding our field of vision globalization and the changing landscape of visual communication. Available: [2005, 21 Jan].

Pope, N. Voges, K. & Brown, M. (2004). The Effect of Provocation in the Form of Mild Erotica on Attitude to the Ad and Corporate Image, Journal of Advertising, 33(6), 69-82.

Rohwedder, C. (2004, 9 Jan). Style & substance: fashion school get real; more students must master technology and marketing on path to becoming designer. The Wall Street Journal, pp. A.7.

Sametz, R., & Maydoney, A. (2003). Storytelling through design. Design Management Journal, 14(4).

Sametz, R., & Maydoney, A. (2003). Storytelling through design. Design Management Journal, 14(4), 18.

Sanders, E. B.-N. (2002). From user-centred to participatory design approaches. In J. Frascara (Ed.), Design and the social sciences: Making connections (pp. 1-8). London, New York: Taylor & Francis Inc.

Sanders, E., & William, C. (2003). Harnessing people's creativity: ideation and expression through visual communication. In J. Langford & D. McDonagh (Eds.), Focus groups: supporting effective product development. London: Taylor & Francis.

Tallon, P. & Kraemer, K. (2007). Fact or Fiction ? A Sensemaking Perspective on The Reality Behind Executives' Perceptions of IT Business Value. Journal of Management Information Systems, 24(1), 13-54.https://doi.org/10.2753/MIS0742-1222240101