Social Innovation and Co-Creation through Design: utilising natural resources to facilitate sustainable development

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Abstract

The study and practice of design is deeply rooted in culture and tradition, establishing resilience through its proven methods and producing robustness in the continual development of knowledge and skills. This research explores the value of co-creative design methods within rural communities as a means to motivate and empower while contributing to new ways of thinking, doing, and understanding sustainability in design practice. Through observational studies, qualitative insights and participatory design methods, this research examines the challenges faced by the rural women of 'Gudiya Village' in Indore, India, where design skills are tested to promote sustainable development through use of natural building materials, resources and techniques. The main focus of the research expands on the role of co-creative practice in disrupting the hegemonic position of design, leading towards and promoting the fluidity in knowledge transfer and exchange. This paper provides a discussion of how design practice and knowledge are influenced by cultural traditions while, in turn, informing new perspectives for cultural production through the symbiotic relationship between designers and communities of practice. The role of design, to educate and empower, is presented as a framework for future designers, researchers and co-creators to embed cultural and sustainable practices as part of shifting resilience into robustness.

Author keywords

Women empowerment; co-creation; social innovation; sustainable development; natural building; community development.

Introduction

Issues of gender-based discrimination and inequality have led to new discourses on promoting women empowerment for future sociocultural development and progress across developed and developing societies. The role of women is brought to the forefront of this research, where their involvement and participation define new, meaningful roles toward achieving sustainable development within rural communities. Design methods, skills, and knowledge contribute to a co-designing process, through which, a group of rural women in Gudiya Village (Indore, India) are tasked with improving upon their living conditions and infrastructural problems. Utilising available natural resources, a combination of traditional and modern building skills and techniques are tested to motivate and encourage the involvement of women in the design processes of planning, decision-making and solution-finding.

This research evaluates the role of design in facilitating and equipping rural women with the skills of natural building, permaculture, and social design practices. The influence and impact of this study is measured by productivity and progress for rural societies in creating new values through social innovation. This paper examines and discusses the following:

- 1. Design Themes *introduction to the importance of women empowerment, sustainable development and social innovation.*
- 2. Case-Study of Gudiya Village *outline of the research methodology, process of co-creation, design prototyping and testing.*
- 3. Design for Social Innovation *discussion on the flow of knowledge transference, development of communities of practice, and a model for social innovation through co-creative design.*

Design Themes

Women Empowerment

The limitations surrounding women in rural areas is a key focus of this research to heighten the awareness of the women from Gudiya Village towards the availability of resources, skills and knowledge as a means for economic independence. According to Shields (1995), the concept of women empowerment is developed by defining a sense of self, allowing identity to inform actions and decisions, and experiencing connections with other members of society. Enabling women to achieve new opportunities leads to the transformation of gender relations within families, empowering women to make decisions to affect their futures (Elborgh-Woytek, *et al.*, 2013). This research examines how a process of awareness, capacity building and co-creation lead to the empowerment of women, furthering the discourse of design's role against the context of social issues.

Sustainable Development

Women empowerment and gender equality are important components of achieving sustainable development in society and culture. The ability of women to participate and co-create, by means of natural building and permaculture design practices, reinstates power to the women of this study to improve upon their living conditions while developing personal knowledge and skills.

Natural building is the sustainable practice of utilising primarily locally-sourced, minimally processed, natural materials. Permaculture design is an ecological design process that considers ethical and ecological principles to create positive change. The concept of sustainable development relies on natural building and permaculture design practices through economical solutions supporting continual development and improvement. The techniques and skills of earthen architecture are transferred and expanded upon through knowledge sharing in the designing of communal spaces.

Social Innovation

Social innovation can be broadly defined as interactions between people and communities to assume responsibility for positive and robust impact. According to Manzini (2015), designers now belong to a world in which everybody designs and this emphasises the importance of designers to provide more initiatives to better facilitate effective design. The role of designers, therefore, has shifted into a space that focuses on social needs, creates new social relationships, and fosters collaboration as a means for sustainability. This collectively contributes to designing societies that lead toward social change, redistributing influence and power by increasing capabilities and knowledge to allow new opportunities to emerge. Social innovation results in the formation of collaborative actions that, through co-creative design, lead toward visible improvements. However, the lasting impact of social innovation is not limited to tangible improvements but affects changes in attitudes, behaviours, and perceptions (Neumeier, 2011).

Case-Study of Gudiya Village

Background and Context

Gudiya Village is situated in the midst of agricultural fields, forests and jungles, without access to urban facilities such as proper roads, transport, stores, schools or hospitals. Descending from the "Jhabua" tribe, the people of the village have been forced to adopt a nomadic lifestyle without any legal rights to own land. This has forced the villagers to labour in nearby agricultural fields to repay debts incurred by previous generations and maintain a livelihood. The people of Gudiya Village live as one large family unit and have built a settlement of 15 houses, of which 10 are made from mud and 5 from brick, all built by the women. The women collaborate with one another to build and improve their village with naturally available resources. Each child is taught from the age of 4

to use mud, soil, bamboo sticks, wood, animal dung, and plants to produce shelters, furniture, utensils and medicine.

The men of Gudiya Village spend the majority of their time outside of the village, staying on the fields or in nearby cities, emphasising the important role of women in this rural community as primary caretakers and leaders. Their daily lives consist of maintaining the local village infrastructure, caring for the animals and children, working in the fields, etc. Although these rural women assume the majority of responsibilities for the village, this is not reflected in their position and status. The living conditions, comprising poor facilities and infrastructure, directly affect the health of the women and children. Poor cooking utilities, structural building issues and water facilities have led to severe health issues such as asthma, respiratory illness, infections, heart disease, spinal conditions, etc.

The women of the village are instrumental to the building and maintenance of their living quarters. They have shared and transferred, through the generations, the knowledge and skills necessary to build their homes with working stoves at the hearth of the family's shared spaces. Against the context of the village, one key area of focus was identified in ways to improve upon the cooking stove. The women have built biomass cooking stoves, which are heated by burning wood, charcoal animal dung or crop residue. Due to poor ventilation and the location of the stoves within each home, the design itself was seen as inconducive to the living environment. The premise of this research began with a design brief to improve the cooking stove with available natural resources, skills, and knowledge.



Figure 1. Living Conditions of Gudiya Village

Research Design and Methodology

This research focuses on the immersive role of the designer-researcher in facilitating a co-creative design process to allow an exchange of knowledge and skills. The main objective of the research was to test how co-creative design methods can introduce the skills of a product designer, interior-architect and cultural agent. Furthermore, it was anticipated that the co-creative process would further empower the women and equip them with design skills to continue developing and improving upon the needs of the village.



Figure 2. Research Design

The research methodology is structured into 5 phases to map out the context of study, understand the issues affecting the village, identify the key design themes, categorise the specific knowledge required for progress, develop a co-creation design process, and measure potential impact. Co-creation, as an important design process, is identified as being instrumental to future progress and development in Gudiya Village.

- 1. **PHASE 1** Gudiya village was identified as the research site. The researcher was able to use ethnographic observations to document daily life activities, understand the environmental context, map the interactions between the women, identify significant objects of use, and clearly examine the immediate needs affecting the village.
- 2. PHASE 2 The literature signified the existing discourses on women empowerment and the role of design. This was identified as a key theme to anchor the research, as the primary inhabitants of the village are women. The researcher's professional knowledge, as an interior architect, was further cultivated by learning new skills in permaculture design. This knowledge led to the second theme of sustainable development, which focuses on the use of natural building materials. The role of the designer, in facilitating social development and change, increases the potential impact for knowledge to sustain cultural traditions while leading towards future progress. Social innovation, as the final theme, reifies the important role of designers to deeply engage in projects comprising design issues across sociocultural dimensions.
- 3. **PHASE 3** Knowledge is produced when confronted by or shared with other forms of knowing and doing. This study acknowledges the activities of the women as following a design practice, as they go through the iterative processes of refining and improving their skills and knowledge. The practical know-how of the women, as a form of procedural knowledge that requires testing and evaluating, was extracted and examined. This set the premise for the co-creative process, where the researcher was able to learn from the women while transferring her specialist skills in the form of knowledge exchange.
- 4. **PHASE 4** The experience of co-creation produced a design intervention, which not only affected the physical environment but became a site for further testing and refinement.
- 5. **PHASE 5** This final phase of design implementation involves the evaluation of the finished object to monitor the quality of the design, observe the object in use, allow the women to further build on the design, and receive feedback.

Participatory design has always been advocated for by design practitioners and researchers, as design is a future-oriented activity and its end-use cannot always be predicted. Cross (1972) called for new approaches to design that involved citizen participation in decision making, as users need to understand the intentions of design to fully integrate its value. Co-creation, as a part of design practice, will change how designers design, what is being designed, and who is involved in the process of design (Sanders & Stappers, 2008). This research involves the active participation of co-creation as a trajectory for new innovations to arise and embolden the village women to continue building on their existing knowledge. A group of 7 female participants were included in this study – four housewives, two teenaged girls and one six year old child. The researcher was able to facilitate the co-creation process by first acknowledging the existing practices and knowledge, informing new ways of making through sustainable methods, and collectively designing an improved outcome.

This study integrates sustainable techniques by building with natural resources and reusing waste to promote a sustainable way of life. Materials were gathered to design and build an improved biomass cooking stove – sand, soil, grass fibres, brick powder, ash, and water. The process embedded the traditional techniques previously utilised by the women, injected the new skills taught by the researcher, and combined available natural resources to redesign and co-create a more efficient and effective outcome.



Figure 4. Co-creation between Designer and Village Women

During the evaluation stage of the research, it was apparent that the women had benefitted from the co-creative process. This established a new level of trust, allowing the researcher to further explore future opportunities to create more valuable solutions for the village. The new knowledge gained by the women equipped them with transferrable skills to understand the importance of identifying problems or issues, following a systematic process, testing and revising, and evaluating the solution.

Design for Social Innovation

Knowledge Transfer and Exchange

The role of knowledge is deeply rooted in this research, which acknowledges the positioning that reality is socially constructed through activities involving human knowledge to produce symbolic representations. Design, therefore, becomes significant as a form of communicating significant meanings. These meanings, embedded within finished designs, are representative of the values pertinent to a given culture. According to Friedman (2000), design practice shifts experiential learning into knowledge creation through a feedforward and feedback mechanism. Design produces its own knowledge across tacit and explicit dimensions to generate new ways of re-contextualising and transforming the built environment. Knowledge is necessary to transform thought into action, a precondition for selecting relevant knowledge to inform the decision-making process.

The women of Gudiya Village held a form of embodied knowing, in the ability to replicate and recreate various objects and forms. These skills represent informal knowledge, largely tacit in how it is used, that relies on perception and experience to establish tangible results. In this manner, the women have always been engaging in design-like processes that transform existing knowledge through practice to produce their own forms of design knowledge (Olsen & Heaton, 2010).

The researcher embarked on the co-creation design process by first decoding the existing knowledge of the women. This included their understanding of natural materials, the reuse of waste, and processes of testing to refine the finished objects. Design, in producing material and non-material culture, requires an understanding of social phenomena and utilises projective ability to predict future subject-object relationships within specific social contexts (Narvaez, 2000). The role of the researcher was to develop new knowledge upon an existing foundation and, in learning from the women, adapt and apply specialist knowledge to facilitate a collaborative learning experience.

The co-creation process allowed knowledge to be transmitted, shared and exchanged through a collective experience that reconciled the distance and power structures separating the boundary between "design as researcher" and "user as designer." Knowledge was fluidly transferred through design experimentation, assigning ownership over the finished object to all involved stakeholders. The utility and function of the design produced new knowledge,

establishing robustness in its ability to change previous knowledge structures. This knowledge is represented by the improved cooking stove, embodying the intentions of the individuals and constituting new meanings in the forming of self-awareness (Csikszentmihalyi & Rochberg-Halton, 1981:104-106).

The knowledge resulting from the co-creation process is socially robust in the fluidity of its transference from the village women to researcher, researcher to women, women to other women, village to other village. Knowledge is gained from individual experience and perception, shared and communicated through processes of making, and represented in finished forms that embody intentions and symbolic meanings. Design objects establish meaningfulness through increased interactions, allowing knowledge to continually adapt and evolve as a part of progress. As the women of Gudiya village continue to explore their new knowledge, applying it to different problem areas, design is able to establish robustness.

Communities of Practice

Bottom-up social innovation is possible when problems affecting a community are posed by everyday life, where design-led processes can be introduced that apply skills and ways of thinking as part of design activities (Manzini, 2014). This allows an opportunity to design with communities, participating with community members to facilitate and foster collaboration. Active participation from the community challenges existing hegemonic structures to initiate the concept of democratised innovation, brought on by the relative ease of accessing information and means of production, to assign new roles and power to the involved stakeholders (Bjorgvinsson, et al., 2010). Co-creation, therefore, requires collective creativity to develop shared visions, ideas and solutions.



Figure 4. A Model for Social Innovation through Co-Creative Design

Social innovation, in rural communities, requires more exposure to knowledge and skills to become sustainable. This suggests involvement from more researchers and designers, but also expanding the network from one community to another. In this manner, design empowers women and equips them with the capacity to further empower other communities of women. The above model takes the research methodology and outlines the key steps for research, indicating the entry or exit points for researchers or participants. Documentation is seen as necessary to structure and formalises the process, allowing new entrants the opportunity to understand the full scope of the design process.

This research, which integrates participatory design as part of a co-creation process, provides a new framework for social innovation through design. The study was initially proposed as a means to teach, share, and improve the living conditions of Gudiya Village. During the initial ethnographic study, the observations revealed the breadth of existing knowledge used in the building of the village infrastructure. This significantly altered the direction of the study, as the researcher was learning during the process of teaching to form a symbiotic relationship.

The research process has produced valuable results evidenced by the ability of the women to acknowledge their existing skills, adopt and adapt with transferred knowledge, creatively produce new solutions, and actively identify new areas for design development. It was discovered during the evaluation stage that the initial participating 7 females had continued sharing the knowledge with other women in the village, after the researcher had exited the field. In learning a design process, they found value in the meaning of collaboration in design to form a community of practice. Social innovation can be sustained when these communities of practice continually evolve and exchange knowledge.

Conclusion

This paper discusses an ongoing research project that continues to explore other opportunities for the women of Gudiya Village to improve their living conditions and generate new means of income. The use of permaculture design has been integral to the women, who have applied it to their traditional ways of making and produced products addressing medicinal and beauty needs. As the women use natural building skills for sustainable development, their newfound knowledge can empower them to continually produce new designs and transfer their skills to promote social innovation beyond Gudiya Village.

This research examines the role of designers in facilitating co-creation and social innovation through participatory methods and knowledge sharing. The study began with a clear understanding of everyday life challenges and issues affecting the village. Through ethnographic observations, the researcher was able to identify a key area of focus and a potential design intervention. Knowledge sharing, by teaching and learning, was critical to the co-creative design process and enabled the women to transfer intentional and emotional values into the finished outcome. Although the biomass cooking stove serves as an improved solution, it represents the knowledge, skills, awareness and identities of the women. The limitations of social innovation are addressed in the framework, indicating where other knowledge sources or participants can enter the process and the key points to document progress for other stakeholders to exit. Insights, findings and framework of this research can be further expanded and tested against other contexts of culture and social issues.

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