The Art of Inclusion & the Architects Approaches to Participatory Design: A Review

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Received	Accepted	Published
02.08.2026	20.10.2026	30.10.2026

https://doi.org/10.61275/ATej-2026-3-3-3

Abstract

In the contemporary practices of architecture, interior design and landscape architecture, designers are increasingly engaged in ways of dealing with people. One of the techniques of doing so is participatory design, which ensures that all the parties who are concerned with the making of a built-environment could be involved in the process of design. In this context, this research delves into the practical strategies employed to engage communities effectively in participatory design, as has been divulged in previous research.

It utilizes a systematic literature review (SLR) methodology drawing from Scopus and ScienceDirect databases. It thus analyzes 14 selected articles while incorporating an additional four, identified as having explicit statements addressing the challenges and the strategies, while also exploring implicit insights into community engagement approaches. The thematic analysis employed categorized eight challenging areas for the designers: community heterogeneity, age groups, gender and priority segments, economic and social factors, physical environment, education and literacy, cultural nuances, and mental/physical health.

The insights gained emphasize the importance of adaptable and inclusive approaches for the designers involved in participatory design. The review articulates the need for skill development, highlighting flexibility and inclusivity as pivotal factors when choosing design approaches aimed at participatory design

Keywords: Designers, Flexibility, Inclusivity, Participatory Design, Tactics.

Introduction

It is now well known that participatory design facilitates active involvement and stakeholder contributions within the design process. Originating from collaborative design and art in the early 20th century, participatory design has become a pivotal framework within the design activities involving the users. Prominent frameworks in contemporary participatory design include design thinking pioneered by Bill Moggridge of IDEO (Brown, 2009), and social design advocated by Victor Margolin and Ezio Manzini (Manzini, 2015; Margolin & Margolin, 2002).

The significance of participatory design manifests in its diverse levels of engagement. In this regard, Simonsen & Robertson (2013) describe participatory design as involving stakeholders in design development, functioning as a method for community problem-solving. A notable aspect is its application in action research, particularly in the contexts requiring situational change (Bannon & Ehn, 2013), extending beyond design to create tangible societal impacts. Methodological choices within participatory design are pivotal, as emphasized by Bratteteig et al. (2013), tailored to project the needs and specific contexts, reflecting its adaptive nature.

Despite these understandings, the extent to which the issue has been examined and tactics that are available to the designers are still not fully known. The designers often grapple with the issue and find that the tools are neither available nor well-articulated. This undeniably, hinders the task of engaging participatory design in design processes that really need the participation of the people. While various participatory methods are available, adaptable to different community characteristics, the success of participatory design goes beyond implementing these methods alone. Understanding the unique attributes of each community is crucial to effectively initiate participatory design. It is believed that successful participatory design demands more than merely applying methods—it necessitates specific yet essential short-term tactics.

In this context, this research examines the degree to which the designers' approaches to participatory design has attracted the researchers and the extent to which they have been examined. Its aim is to identify the effective short-term tactics for engaging communities, aiming to fill the knowledge gaps by exploring previously unexplored tactical dimensions. Its objectives are as follows.

1. To identify the extent to which the issue has been examined and the kind of research that have so far been carried out.
2. To reveal the skills required by the designers to be engaged in participatory design
3. To facilitate the initiation of participatory design practices by the designers across diverse community contexts.

Theoretical Framework

An intriguing perspective by Robin van Oorschot (2022) delineates two primary roles within participatory design: firstly, as a designer engaging in action research, involving systematic reflection and analysis of personal practices and experiences and secondly, as a design researcher observing how the others design within a broader societal collaborative framework, integral to the studied phenomenon (van Oorschot, 2022). Nevertheless, participatory design diverges from user participation. Indeed, it involves joint activities and solution developments, whereas user participation involves engaging with the established solutions (Smith and Iversen, 2018).

Design stands as a pivotal tool for dissecting issues and seeking pertinent solutions. The active involvement of communities in the design process emerges as a strategic approach to ensure the widespread acceptance of design solutions (Bosco et al., 2022). Recognizing that communities possess unique insights and perspectives related to their challenges, flexible and comprehensive involvements become imperative (Lasage et al., 2015; Dayaratne, 2016). Within the community-based projects, participatory design not only learns from but also encapsulates and engages collective knowledge.

Indeed, community development is described as a social process that aims to enhance the quality of life (Robinson, Jr & Green, 2011a). Wilkinson's definition (1991), as cited in Wilkinson and Green (2011), portrays community development as a network of engaged actors, stressing the pivotal role of stakeholders in fostering effective collaboration (Robinson, Jr. & Green, 2011b). Moreover, Robinson, Jr. & Green (2011a) underscore that community development is influenced more by the practices rather than by theory, emphasizing that desired outcomes in community developments are intimately linked to tangible actions and transformations occurring in people's everyday lives (Garkovich, 2011). In this regard, Luck

(2018) states that intervention projects in design and applied technology can better define the concept and characteristics of participatory design through equality, situation-based actions, mutual learning through tools, techniques, and alternative technologies, along with the democratic practices.

Manzini (2015) shows that design goes beyond its visual aspects and can serve as a powerful catalyst for social change. The core of this design practice lies in the interactions among the diverse stakeholders. The value of productive interactions is apparent in its capacity to establish nurturing and empowering environments (Fasoli & Tassinari, 2017). According to Bridger et al. (2011), social interactions lay the groundwork for a community. Approaches to interaction, as proposed by Wilkinson (1990) cited in Bridger et al. (2011), stress the importance of both the process and community engagement in devising solutions to encountered challenges. Meanwhile, Hameem and Asaduzzaman (2023) argue that whatever steps taken should be community-involved, even though the level of participation may vary. In fact, communities are perceived as outcomes of collaborations, active involvements, and collective endeavors. However, Wang et al. (2023) point out a paradoxical impact where initiating collaborations may potentially weaken the self-reliant communities. Furthermore, at a more fundamental level, Smith and Iversen (2018) emphasize that the existing paradox lies in the weakening of the meaning of participation itself as participatory design gains broader acceptance in the discourse of design in general.

When social interactions face obstacles, the progress and advancement of communities often stall. The effectiveness of participatory design approaches, particularly those integrating designers within communities, is heavily reliant on the quality of relationships and the degree of consideration among all the involved parties. Community progress doesn't solely hinge on the end results but highlights the joint endeavors directed towards achieving the objectives.

According to Bridger et al. (2011), limitations in the interactions are less prevalent among the people in homogeneous communities, whereas dealing with heterogeneous communities poses greater challenges. Hence, for successful community development, efforts should concentrate on guiding diverse communities towards understanding and embracing equality, where the leadership role assumed by the designers plays a pivotal part.

However, the challenges of executing participatory design often stem from uncertainty among the designers and the stakeholders regarding the starting point, their roles, organizational aspects, and identifying the engaged stakeholders (Smeenk, 2023). Prior research addressing these issues can be found in the Design Choices Framework for Co-Creation proposed by Lee et al. (2018) and a case study within the European Horizon 2020 project conducted by Smeenk (2023). Both sources present models and methods aiming to establish a common ground between the designers and the stakeholders within the participatory design process. Smeenk (2023) notably applies Lee's (2018) framework in an applied project scenario.

This research employs the same theoretical framework to look at the papers published thus far on the issue of participatory design related to the built-environment. The theoretical notions enable the understanding of what has been studied and what has been found out.

Research Methods

This article employs a systematic literature review (SLR) method by utilizing the Scopus and Science Direct databases. This method provides a structured approach to selecting articles. University access facilitated the retrieval of digital documents during the collection phase from August 2022 to October 2023. The review process, as outlined in the Table 1, encompassed four primary stages: collection, screening, examination, and analysis. Search queries employed the keywords: ‘participatory design’ and ‘community development.’ The articles were filtered within the databases by using quotes around the chosen keywords, focusing on publications from the last decade within the fields of social science and arts & humanities to acquire pertinent literature. The collected document types primarily included journal articles ranked among the top 100 within these databases.

The selection process encompassed screening titles and reviewing abstracts. Inclusion criteria for referencing in the study consisted of original articles discussing community-based

participatory design projects. The examination phase entailed thoroughly reading each article and creating annotated bibliographies. Initially, there were 38 articles with titles pertaining to the topic of interest. To be included, articles needed to explicitly address challenges encountered in the projects and propose corresponding solutions based on stakeholder types. Only fourteen articles met these criteria.

Table 1: Process of the Literature Review
Source: Authors

Process	Objectives	Results
Collecting: Keywords to be used with quotation marks: "participatory design" AND "community development"	Seeking articles that discuss participatory design in the framework of community empowerment	12 articles obtained from the Scopus database, and 31 articles obtained from the ScienceDirect database
Sorting: 1. Articles published within the last 10 years 2. Subject area: Social Science 3. Document type: Journal Articles	Looking for articles discussing the practice of participatory design within the last 10 years	
Screening: Sorting titles	Choosing articles that discuss participatory design within community projects	38 articles
Checking Suitability: 1. Reading the abstract 2. Removing incomplete or duplicate articles	1. Seeking original articles focusing on participatory design within community projects as the primary articles 2. Seeking original articles or literature reviews specifically addressing participatory design strategies, serving as supporting articles	26 articles
Examination: 1. Reviewing the full articles 2. Compiling bibliography annotations	Determining the approved articles for assessment	14 articles
Analysis: Identifying explicit statements	1. Collecting clear statements outlining challenges and immediate tactics for engaging with the community in participatory design projects 2. Thematic analysis	Utilizing an analysis table and thematic analysis diagrams

Results and the Findings

Characteristics of selected articles

The analysis of 26 pertinent articles reveals a trend where certain authors provide limited details on engaging communities as stakeholders in participatory design. Therefore, some articles were not carried forward to the final analysis. Consequently, only 14 articles were incorporated into the analysis as shown in the Table 2. One article listed in the Table 2 did not explicitly mention the exact number of participants (Franceschi et al., 2023). Moreover, four articles indicated variations in participant numbers across the different stages of the workshops discussed (Dayaratne, 2016; Bertella et al., 2021; Soikkeli et al., 2023; Bromark et al., 2023).

The process of identifying explicit statements regarding challenges and tactics

The research commenced with the analysis by isolating explicit statements within the articles that discussed challenges and their corresponding resolutions related to various

stakeholder types. This method helped streamline the process of analysis. However, to enhance the depth of the study, the remaining 12 articles were maintained because of their relevance to the topic. Furthermore, the analysis was augmented by incorporating four additional supplementary articles. Although these articles didn't explicitly outline the encountered challenges, they offered valuable insights into the approaches for community engagement as shown in the Table 2.

Table 2: Explicit statements regarding challenges and tactics identified in the findings of the chosen articles
Source: Authors

Author	Project	Challenges	Stakeholder	Tactics
Dayaratne (2016)	Construction of houses in tea plantations in Sri Lanka	Perception gap between architects and the community concerning the concept of ideal housing	12-20 residents, Stassen Exports (SEL) coordinator, and architects	Assigning psychological tasks involving recalling familiar locations, envisioning ideal housing aspirations, and utilizing dioramas for visualization
Oyinlola et.al. (2018)	Bottle houses in Nigeria	Adopting eco-bricks made from bottles as a construction material for housing	11 households and local SMEs (Small and Medium Enterprises)	Utilizing the conventional techniques preferred and already practiced within the community for building houses
Priya et.al. (2020)	Designing elementary school classrooms in India	Coordinating processes and interactions with stakeholders, alongside the challenge of eliciting ideas from students	40 elementary school students and teachers	Utilizing a diverse range of methods, such as dialogue, brainstorming, written ideation, cartoon sketches, drawings, questionnaires, and role-playing during the initial sessions
Bertella et.al. (2021)	Tourism innovation during the COVID-19 crisis in Norway	The stakeholders' inadequate development of ideas	16 representatives from the city government, shopping associations, and local businesses	Employing stimuli through video content
François et.al. (2021)	Truck dashboard design, France	Professional gap	27 truck drivers and two professional designers	Commencing with an informal coffee gathering and employing everyday language throughout the dialogue process
Zallio, et.al. (2022)	Online-based participatory design for developing standards on dementia-inclusive communities in Ireland	Participants from varied backgrounds	150 individuals comprising dementia patients, caregivers, healthcare service users, service providers, associations, working groups, and organizations representing the general public	Selecting four key experts considering their expertise, geographical distribution, and the strength of their networks for stakeholder recruitment
Coenraad et.al. (2022)	Development of Scratch Encore curriculum for students in grades 5-8, USA	Power relations	34 teenage students, five teachers, 15 parents of students, and three school administrators	Utilizing casual attire, addressing participants by their first names, providing refreshments, and distributing gift cards throughout the workshop sessions

Bromark et.al. (2023)	Placement and relocation of young people's residences, Sweden	Gap between two primary stakeholders: the young age group and the social worker group	Seven individuals from the young age group (16-20 years old) and eight from the social worker group. The number of participants decreased in the subsequent workshop sessions	Segregating primary stakeholders in the initial phase
Franceschi et.al. (2023)	Development of dry anaerobic digestion power plant for municipal solid waste treatment on a regional scale, Colombia	Coordinating stakeholders' schedules for workshops, interviews, and Focus Group Discussions	Municipalities & representatives from ASOCENTRO (10 participants), researchers, biogas producers, community members, representatives from local public service companies, and environmental institutions (the remaining number not specified)	Avoiding any delays in scheduling activities
van Langen et.al. (2023)	Participatory Design of Participatory Systems (PDPS), Netherlands	Trust and apprehension in divulging sensitive information	A group of six individuals comprising a planner, financial director, head of technical department (repair unit), general director, sales manager, and planning manager	Creating an environment conducive to acquaintance by employing targeted questions about values and missions
Soikkeli et.al. (2023)	Reshaping Living, New Structure and New Life for Old Suburbs Project, Finland	A diminished response to the initial survey and the possibility of low participant attendance during workshop sessions	55 multicultural apartment tenants, mostly retirees	Employing straightforward survey queries, amalgamating online and traditional paper surveys, incentivizing participants to respond by offering movie ticket raffle, and conducting evening workshops accompanied by coffee
Smeenk (2023)	European Horizon 2020, Netherlands	Organizing stakeholders	21 residents, three policymakers, and one strategy expert	Utilizing commonly understood and universally accepted vocabulary and terminology
Tunc, et.al (2023)	eHealth project, European Research Pharaon, Netherlands	Low psychological openness among the elderly	80 elderly individuals, 20 geriatric experts, and industry partners	Conveying narratives through fictional personas
Iivari, et.al (2023)	Gender Equality Plan at a University in Europe	Conflict arising from opposing perspectives on gender equality.	13 participants from five universities across five European countries	Arranging sessions based on specific target groups

Table 3: Supplementary articles to strengthen the analysis
Source: Authors

Author	Approaches
Corsini et.al. (2022)	Conducting interviews lasting 10 to 30 minutes to avoid discomfort, fatigue, and feelings of excessive scrutiny among 23 migrants, refugees, & asylum Seekers (MRAs) in Greece.
Kerr et.al. (2022)	Separating stakeholders during the planning phase to avoid issues arising from conflicting viewpoints and perceptions of hierarchy. Preliminary activities aimed at breaking the ice and boosting excitement before the project include showcasing amusing videos from YouTube, followed by using visual personas with cartoons for participants who have autism. The project being addressed is the Cooperative Research Centre for Living with Autism in schools across Australia.
Guzmán-Ramírez et.al. (2020)	Conducting a tour and observing the study area to identify key actors to engage with the Trancas community, Mexico.
King et.al. (2022)	A literature review on participatory design for priority communities (race/ethnicity, culture, disabilities, LGBTQIA+, migrants, and religious groups) highlighting the lack of attention to ethical issues in participatory design.

Thematic Analysis

A thematic analysis was conducted focusing on explicit statements detailing strategies to overcome engagement challenges with stakeholders, specifically documented under the 'Tactics' column in the Table 2 and the 'Approach' column in the Table 3. The identified themes encompassed the following.

Table 4: The Themes and the Sources
Source: Review

The Theme	Sources
Community homogeneity and heterogeneity	• Zallio et al. (2022) Online-based participatory design. A Case Study of Developing International Standards During a Pandemic. Strategic Design Research Journal, 15(01), 39–51 • Franceschi et al. (2023). ADPM Design: The use of a Participatory Methodology to design a dry anaerobic digestion power plant for municipal solid waste treatment. Energy for Sustainable Development, 74, 173–184 • Soikkeli et al. (2023). Challenges of participatory design in apartment buildings' renovation projects in Finland. Journal of Housing and the Built Environment, 38, 1889–1905.
Age groups	• Priya et al. (2020) Collaborative and participatory design approach in architectural design studios. Social Sciences & Humanities Open 2, 100033, 1–12. • Coenraad et al. (2022) Using participatory design to integrate stakeholder voices in the creation of a culturally relevant computing curriculum. International Journal of Child-Computer Interaction, 31, 1–14. • Zallio et al. (2022) Online-based participatory design. A Case Study of Developing International Standards During a Pandemic. Strategic Design Research Journal, 15(01), 39–51 • Bromark et al. (2023) Co-designing a dynamic tool to enhance participation for young people: A participatory design project with young service users and social workers. Children and Youth Services Review, 147, 1–10. • Soikkeli et al. (2023). Challenges of participatory design in apartment buildings' renovation projects in Finland. Journal of Housing and the Built Environment, 38, 1889–1905. • Tunc et al. (2023), Scenario-based Co-design with Older Adults: A Design Case on Decreasing Loneliness. International Journal of Design, 17(2), 99–113.
Gender and priority social groups	• Livari et al. (2023) Participatory design meets gender equality at European higher education institutions. CODESIGN, 1–23. • King et al. (2022) Co-design for indigenous and other children and young people from priority social groups: A systematic review. SSM - Population Health, 18, 1–10. • Corsini et al. (2022), Design with and by Marginalized People in Humanitarian Makerspaces. International Journal of Design, 16(02), 91–105.
Economic and social factors	• François et al. (2021) Usability and acceptance of truck dashboards designed by drivers: Two participatory design approaches compared to a user-centered design. International Journal of Industrial Ergonomics, 81, 1–13 • Bromark et al. (2023) Co-designing a dynamic tool to enhance participation for young people: A participatory design project with young service users and social workers. Children and Youth Services Review, 147, 1–10.

Physical environment	• Dayaratne, R. (2016) Creating places through participatory design: Psychological techniques to understand people's conceptions. Journal of Housing and the Built Environment, 31, 719–741. • Oyinlola et al. (2018) Bottle house: A case study of transdisciplinary research for tackling global challenges. Habitat International, 79, 18–29.
Education and literacy	• Bertella et al. (2021) Workshop methodology design: Innovation-oriented participatory processes for sustainability. Annals of Tourism Research, 89, 1–13. • Smeenk, W. (2023) The Empathic Co-Design Canvas: A Tool for Supporting Multi-Stakeholder Co-Design Processes. International Journal of Design, 17(2), 81–98.
Culture	• van Langen et al. (2023) Participatory Design of Participatory Systems for Sustainable Collaboration: Exploring Its Potential in Transport and Logistics. Sustainability, 15(7966), 1–43. • Coenraad et al. (2022) Using participatory design to integrate stakeholder voices in the creation of a culturally relevant computing curriculum. International Journal of Child-Computer Interaction, 31, 1–14. • Priya et al. (2020) Collaborative and participatory design approach in architectural design studios. Social Sciences & Humanities Open 2, 100033, 1–12. • Guzmán-Ramírez et al., 2020), Diseño con y para la gente. Experiencia de diseño participativo en la comunidad de Trancas, Dolores Hidalgo, Guanajuato, México. Revista Legado de Arquitectura y Diseño, 15(27).
Mental and physical health	• Zallio et al. (2022) Online-based participatory design. A Case Study of Developing International Standards During a Pandemic. Strategic Design Research Journal, 15(01), 39–51 • Kerr et al. (2022) Integrated Co-design: A Model for Co-designing with Multiple Stakeholder Groups from the 'Fuzzy' Front-end to Beyond Project Delivery. International Journal of Design, 16(2), 75–90.

The outcomes of the analysis are presented in the Figure 1. To distinguish the primary articles from the additional ones, those explicitly mentioning the challenges were marked in green and those discussing community engagement methods solely were marked in orange. Additionally, five articles revealed challenges spanning two or three different areas.

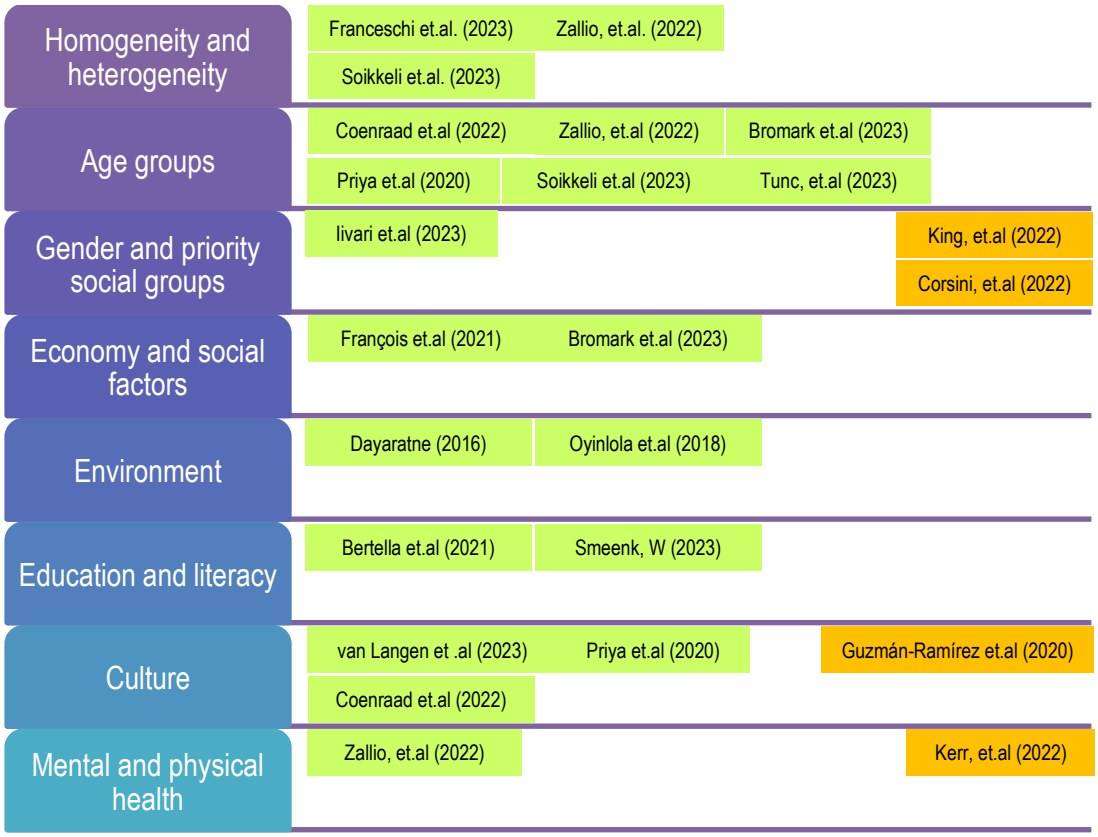


Fig. 1: An overview of thematic analysis as referred to in the Tables 2 and 3
Source: Authors

Notably, age groups emerged as the most frequently encountered challenge across the articles. Challenges within participatory design conducted in institutional settings such as schools and industries were categorized under cultural challenges, reflecting the complexities in stakeholder relationships within these contexts.

Discussion

The challenges and necessary flexibility for designers engaging with communities

Despite the rapid evolution of participatory design methods, certain aspects cannot be solely addressed through formal and structural approaches. Designer flexibility plays a crucial role in overcoming these barriers. Approaching communities in a more informal and amiable manner, such as engaging in relaxed situations like coffee meetings or casual conversations (Soikkeli et al., 2023; François et al., 2021), allows the designers to build closer and more natural relationships with the potential participants. This can help create a more open atmosphere and make the participants feel more comfortable sharing their views, needs, and the aspirations. While formal methods in participatory design hold significant importance, informal aspects like these social tactics should not be disregarded. Personal and close involvement with the community can aid in building trust, understanding underlying social dynamics, and capturing needs and perspectives that might not be evident in the formal approaches. However, it is crucial to remember that these informal approaches must also be accompanied by caution and awareness of ethical boundaries and safety (King et al., 2022) to ensure that community engagement remains positive for all the involved parties (Kerr et al., 2022). Overall, these short-term tactics can provide significant added value in the context of participatory design. They reinforce the concept that participatory design doesn't always rely solely on formal frameworks but also requires sensitivity to the social and emotional relationships between the designers and the communities they engage with (Luck, 2003).

Addressing varying degrees of complexity within the communities is crucial in participatory design, highlighting the significance of designers' adaptability in encountering the following challenges:

1. **Homogeneous and heterogeneous communities**: Addressing homogeneous communities, characterized by shared cultural, religious, or belief backgrounds, may offer a more straightforward approach due to shared perspectives and cohesive understandings. However, engaging with heterogeneous communities, comprised of diverse cultural backgrounds, beliefs, or conflicting objectives, demands greater flexibility in devising inclusive strategies and adapting approaches to accommodate a wide array of needs and viewpoints.
2. **Age groups**: Recognizing diverse perspectives on participatory design across various age demographics holds paramount significance. Engaging with children demands distinct methodologies compared to interactions with the adults or the seniors. The requisite flexibility to adjust language, methodologies, and appropriate techniques for each age cohort is indispensable in fostering meaningful and productive participation.
3. **Gender**: Comprehending gender dynamics within participatory design is pivotal. Societies with established gender-based task divisions may influence participation in the design process. Therefore, designers should exercise flexibility to cultivate an inclusive environment that encourages equal participation across all the genders.
4. **Economic and social factors**: Economic and social disparities often influence community participation in design endeavors. Recognizing and understanding these differences among societal groups play a crucial role in adapting approaches. In scenarios marked by substantial income gaps, the flexibility to adjust program costs or enhance accessibility becomes imperative for effective participatory initiatives.
5. **Physical environment**: Variances in the physical environment, such as urban versus rural settings, dense urban environments, or less accessible areas, can impact community participation and understanding of participatory design. Adapting locations, and technology to suit the specific physical environment becomes crucial for ensuring effective engagement.

6. **Education and literacy**: The educational levels and literacy within a community greatly influence their engagement in participatory design. Designers must account for this by employing effective communication methods, adapting language and materials, and offering necessary support to ensure equitable participation, irrespective of varying education levels.
7. **Culture**: Cultural aspects such as norms, values, and local traditions are vital. Understanding the community's cultural context enables the designers to respect local wisdom and develop sensitive approaches that uphold the cultural values.
8. **Mental and physical health**: Adapting timing, duration, or interaction methods based on the participants' health and well-being needs is crucial.

Each of these categories expands the understanding of complexity in participatory design. When facing these complexities, designers must be flexible in adapting their approach, not only involving the ability to adjust design techniques but also understanding and appreciating differences. They need to tailor communication and approaches appropriately to accommodate the diversity within the engaged communities. Consequently, designers require broad skills and high sensitivity to diverse social contexts. Flexibility in accommodating differences within these categories is the key to successful, inclusive, and relevant design.

Skills the Designers Need to Develop in the Context of Participatory Design

Literature reveals that the designers must possess robust communication skills, encompassing both verbal and non-verbal aspects. The capacity to convey thoughts clearly and actively listen is pivotal to comprehend and address diverse perspectives and needs within the engaged community. Given the extensive interactions between the designers and the community, showcasing empathy and practicing active listening are fundamental. Empathy fosters an understanding of different viewpoints and values, enabling the designers to grasp the perspectives and requirements of a community effectively.

In fact, clear and straightforward articulation of the project goals, processes, and expectations is imperative. Precise communication helps prevent misunderstandings and establishes trust. Presenting design ideas in a structured manner, easily comprehensible to all the stakeholders involved, is also equally crucial. Flexibility in the communication style is essential since different communities often prefer distinct communication approaches. Designers must adapt their styles to match the needs and preferences of the diverse communities. Developing strong, trust-based relationships with the community is essential. Effective conflict management is also crucial to nurture a positive collaborative environment. Moreover, understanding the language and cultural subtleties of the involved communities is pivotal. This knowledge helps prevent misinterpretations or inadvertent actions that could impede effective communications. Finally, the designers need to cultivate persuasive skills and efficient relationship management abilities.

Designers must cultivate observational skills and empathy to discern social dynamics, understand cultures, situations, and the diverse needs of the communities. Meticulous observations enable the designers to grasp the patterns, habits, and community needs at a profound level. In fact, it is pivotal to empathize and relate to the feelings of the community, as well as the motivations, and the requirements, allowing the designers to experience and understand their perspectives. Observation and empathy entail not just one-time observations but also establishing enduring relationships with the community. Continuous engagement helps the designers deeply comprehend the evolving needs and transformations within the community.

Moreover, embracing openness and a commitment to ongoing learning is crucial. Designers should welcome diverse perspectives and new insights to enrich their understanding of the community. These observational and empathetic skills yield profound insights into the community's challenges, enabling the creation of innovative, tailored solutions that address their genuine needs. Effective observation involves not only a broad view but also attentiveness to crucial details, essential for understanding community preferences. Ultimately, honing

observation and empathy skills paves the way for enhanced collaboration and more impactful work with the community.

Designers must skillfully adapt and embrace social, cultural, economic, and environmental differences. Acknowledging these differences is crucial, but equally important is remaining open to diverse perspectives while respecting and understanding the varied beliefs and needs within the engaged community groups. Throughout the design process, designers should adeptly adjust to differences by accommodating various communication styles, selecting appropriate methods, and effectively managing conflicts arising from differing perceptions or interests. Embracing these differences often sparks creativity. Designers who are flexible and open-minded, valuing diversity, can generate more innovative and relevant solutions by considering a multitude of viewpoints. It's imperative for the designers to understand that there's no universal approach. Different communities have distinct limitations, needs, and unique characteristics that demand acknowledgment and understanding. Flexibility and openness to differences foster diverse collaborations and cultivate an environment where participation is recognized and valued within the design process.

Literature also reveals that designers must cultivate collaborative skills, encompassing the ability to facilitate discussions, consultations, and cooperation. Effective communication is pivotal, enabling the clear articulation of project objectives, processes, and expectations. This involves active listening, addressing queries, and explaining concepts comprehensibly. Asking pertinent and insightful questions during consultations is fundamental. It aids in comprehensively understanding the community's needs, expectations, and challenges. After gathering community input, designers should convey the consultation outcomes. Summarizing feedback, demonstrating understanding, and explaining how this input will shape the design process are essential steps. Developing robust, trusting relationships with the community is paramount. Designers should adopt a team-oriented approach, acknowledging the diverse expertise held by team members and the community. This involves recognizing and valuing the unique contributions each individual brings to the table. Subsequently, designers must adeptly navigate collective decision-making processes. They should facilitate discussions to achieve consensus, integrating diverse perspectives into resulting solutions.

Designers must possess a deep understanding of ethical principles when collaborating with communities and must navigate cultural influences that impact participation. This encompasses ethical considerations in data collection, utilization, and management within the design process. Prioritizing privacy policies, ensuring anonymity, and obtaining appropriate permissions are essential for data security and protection. Adherence to professional ethical standards is paramount, emphasizing honesty, transparency, and integrity in both the design process and communication with the community. This extends to treating each community member with respect, dignity, and ensuring their participation is voluntary. Designers must avoid any form of exploitation or manipulation during the design process. Understanding the values, beliefs, and cultural norms within the community is fundamental. Designers should create solutions that align with existing cultural contexts, demonstrating sensitivity towards language, symbols, and thought processes associated with the community. Recognizing language diversity and cultural contexts is crucial in communication. Embracing cultural diversity and demonstrating openness and respect is integral to creating an inclusive environment that values differences. Adapting design solutions to local customs, traditions, and contexts within the community is essential. Leveraging local knowledge and engaging the local stakeholders aids in creating culturally relevant, accepted, and sustainable solutions.

The Challenges and Benefits of Mastering Community Engagement Skills for the Designers

Literature reveals that the mastery of the skills necessary to navigate the intricate nature of participatory design poses several challenges for the designers. They are as follows.

1. **Restricted experience and comprehension**: Designers with limited exposure or understanding of diverse communities may struggle in learning and grasping these contexts.

2. **Challenges in acquiring pertinent information**: Accessing certain communities, especially remote or less accessible ones can occasionally present obstacles.
3. **Challenges in communication and language**: Engaging with communities that have distinct languages, norms, and values can be daunting. Constraints in language proficiency or comprehending local cultural intricacies could impede effective communication.
4. **Challenges in adaptation**: Every community has its unique traits, requiring strong adaptability skills to find effective approaches.
5. **Challenges due to resource and time constraints**: Limitations in the resources—such as time, budget, or workforce—can hinder the process. Designers may face difficulty in allocating sufficient time to thoroughly comprehend the context of each community.
6. **Dealing with resistance to change**: Some communities may exhibit resistance or reluctance to engage in participatory design processes. Addressing and managing resistance or disagreement towards participatory initiatives can pose a significant challenge.
7. **Difficulty in managing conflicts**: Handling conflicts or misunderstandings, particularly in heterogeneous communities with diverse opinions, demands advanced skills in conflict resolution.

Solving these challenges demands patience, continual learning capabilities, and a commitment to adapting and improving the essential skills as experience and understanding expand. However, there are benefits for the designers in mastering relevant skills to tackle the intricacies of participatory design. They are as follows.

1. **Enhanced relevance**: The capacity to accommodate differences across diverse social, cultural, and environmental contexts empowers designers to develop more pertinent and advantageous solutions tailored to the involved communities.
2. **Improved engagement and participation**: Proficient communication, empathy, and astute observational abilities foster stronger relationships and greater acceptance within communities. This, in turn, has the potential to augment engagement and active involvement in the design process.
3. **Varied solutions**: Flexibility in accommodating societal differences enables designers to create a wider array of comprehensive solutions that integrate diverse perspectives and cater to different needs.
4. **Enhanced sustainability and relevance**: Designers who are attuned to social and cultural contexts are better equipped to develop solutions that prioritize sustainability and long-term relevance within the engaged communities.
5. **More effective collaboration**: Proficiency in consultation, collaboration, and teamwork with diverse stakeholders enhances effectiveness in achieving shared goals within participatory design projects.
6. **Professional recognition and credibility**: Designers proficient in navigating complexity with flexibility and social sensitivity are often acknowledged for their capability to deliver appropriate and effective solutions across diverse contexts.
7. **Increased influence**: Designers who possess the ability to understand and collaborate within diverse community contexts have the potential to wield a more significant impact in effecting positive change within the involved communities or society.

According to literature, these skills empower the designers to be more adaptive, responsive, and effective in addressing the inherent needs and challenges within participatory design. This enhances the role of designers as facilitators, capable of creating impactful and relevant solutions for communities.

The Practical Implications

This research posit that the classification of complexity in participatory design can be shaped into tools for assessing the degree of difficulty and predicting the necessary tactics. It is maintained that classifying complexity in participatory design as a tool for assessment and forecasting tactics can provide fundamental insights to develop more suitable and efficient strategies in managing associated challenges. Below is an explanation of how these complexity categories can serve as tools for assessment and tactical planning:

1. **Diagnosing specific challenges**: Complexity categories offer designers a framework to diagnose challenges inherent to specific contexts. For instance, when faced with issues related to cultural differences, designers can precisely identify how that particular culture influences the design process.
2. **Estimating appropriate tactics**: Each complexity category may necessitate distinct approaches or tactics. For example, when addressing issues related to resource limitations, designers can anticipate tactics such as optimizing resource utilization or formulating strategies to secure additional financial support.
3. **Planning more suitable and measured approaches**: This can aid in adjusting communication strategies, participatory approaches, or even technology usage based on the identified needs.
4. **Developing more relevant solutions**: This helps the designers mitigate the risk of errors or mismatches in designing solutions.
5. **Evaluating the potential impact**: This contributes to success of the applied strategies.

Table 4: Development of a diagnostic table for complexities in participatory design challenges
Source: Authors

	Assessment categories			Design Process
Complexity categories	Good	Adequate	Needs Improvement	
Cultural differences				
Resource limitations				
Communication constraints				
Resistance to change				
Technical complexity				

The table is populated with succinct descriptions or essential insights illustrating the interactions between each complex category and the stages of the design process. In fact, this resource can assist the designers in identifying the challenges encountered at each phase of the design process and devise suitable tactics to tackle these complexities.

Conclusion

This research examined the practical strategies employed to engage communities effectively in participatory design, as has been divulged in previous research. It revealed that participatory design represents an approach deeply ingrained in community involvement, leveraging collaborative efforts with stakeholders to forge sustainable and pertinent solutions. It transcends a singular method, embodying a diverse array of adaptable techniques attuned to contextual needs. The uniqueness inherent in each community necessitates a bespoke approach, one that accommodates and honors their distinct characteristics.

According to literature, the designers must cultivate a skill set encompassing effective communication, astute observation, empathetic understanding, adept consultation, and collaborative prowess to navigate the intricacies inherent in engaging communities within the participatory design framework. It is revealed that anchoring the practice in ethical considerations, cultural sensitivity, and an adaptable technological embrace is imperative to ensure inclusivity, respect for cultural norms, and the fostering of diversity throughout the process. Acknowledging individual limitations and singularities among the participants is

pivotal in striving for equality in participatory design endeavors. Viewing participatory design not merely as a methodology but as a paradigm catering to the intricate tapestry of complexities, diversities, and the relevance of each step taken is crucial, especially in advancing sustainable development goals.

While the reviewed literature reveals the extent to which current research has delved into the issue of promoting participation, further exploration through extensive literature review may unveil diverse models in approaching culturally and geographically disparate communities, offering broader insights and more varied findings. In fact, to expand the scope of research in this domain, various suggestions can be explored. These encompass conducting comprehensive case studies that delve deeply into the implementation of participatory design within distinct projects spanning diverse cultural and geographical settings. At the same time, there is potential in formulating a more intricate and tailored framework or assessment tool designed explicitly to evaluate the efficacy of participatory design in specific contexts.

Furthermore, the creation of targeted training programs aimed at enhancing designers' competencies in participatory design merits consideration. These programs could encompass skill development in cross-cultural communication, honing observational aptitude, and adapting to evolving technologies. It should be noted that the pragmatic application and refinement of the diagnostic table proposed in this study necessitate further testing within practical contexts to ascertain its usability and effectiveness.

Acknowledgements: Funding
This Research was funded by Lembaga Pengelola Dana Pendidikan (LPDP), grant number 1457/J5.2.3/BPI.06/10/2021, Balai Pembiayaan Pendidikan Tinggi (BPPT), Ministry of Education, Culture, Research and Technology, Republic of Indonesia.

Statement of Conflict of Interest: The authors declare that there is no conflict of interest in carrying out this research.

Ethical Practice: This research followed accepted ethical practices. It did not involve human participants, fieldwork, interviews and or the collection of personal data. Nevertheless, it followed the accepted ethical standards.

Availability of Data: This study does not report any original primary data. However, data is available for scrutiny if officially requested.

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