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Disability Studies and Inclusive Design: Advancing Accessible Environments, Technologies, and Societal Attitudes

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ABSTRACT

This research delves into the intersection of Disability Studies and Inclusive Design within Indonesia, focusing on advancing accessible environments, technologies, and community attitudes. Through a mixed-methods approach comprising qualitative interviews and quantitative surveys, the study unveils insights into the prevailing state of disability inclusion. The findings illuminate disparities in accessible environments across urban and rural regions, showcase varying levels of technology integration, and provide a nuanced understanding of community attitudes. The research underscores the imperative of policy interventions, awareness campaigns, and collaborative efforts to foster an inclusive Indonesian society.

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1. INTRODUCTION

Indonesia, an archipelago with a rich and diverse culture, is indeed at a crossroads in development where the principles of inclusivity and accessibility are crucial. Indonesia is working towards sustainable development, focusing on aspects such as preserving local ecological knowledge, improving urban design, and enhancing public services.

The Nusantaraization environmental paradigm aims to maintain the biodiversity and culture of the Malay Archipelago by integrating local ecological knowledge (LEK) with sustainable practices and technologies [1]. This approach recognizes the importance of indigenous knowledge and local wisdom in promoting sustainability in various landscapes, including maritime, mountainous and forest areas [1]. Inclusivity and accessibility are also important in urban design, as demonstrated by efforts to provide green open spaces in Indonesia [2]. Indonesia has implemented a policy to ensure the provision of green open space, as mandated by the Minister of Public Works Decree number 5 of 2008 [2]. However, during the Covid-19 pandemic, the implementation of accessibility faces challenges due to physical distancing rules and operational standards [2]. Innovative design solutions for public

green spaces can help overcome these challenges [2].

Improving public services, such as health and education, is another important aspect of Indonesia's development [3]. The quality and accessibility of these services can have a significant impact on people's well-being. For example, research shows that the average distance to the nearest hospital is significantly associated with maternal health service utilization6. Reducing regional disparities in access to health facilities is therefore critical to achieving the Sustainable Development Goals (SDGs) [4].

In addition to these efforts, Indonesia's rich cultural heritage, such as Islam Nusantara, demonstrates the country's cosmopolitan nature and its ability to assimilate and complement various cultural elements [5]. This inclusive approach to culture and religion can contribute to the development of a more harmonious and tolerant society. In summary, Indonesia's development is at a critical juncture where inclusivity and accessibility are of paramount importance. The country is making great strides in preserving local ecological knowledge, improving urban design and enhancing public services. By continuing to focus on these aspects, Indonesia can work towards a future that is more sustainable, inclusive and accessible to all its citizens.

Disability Studies has indeed catalyzed a paradigm shift by viewing disability as a social construct rather than an individual shortcoming [6]. This shift has led to a greater focus on inclusive education and the need to address the various aspects related to it, such as historical context, education system, policy framework, infrastructure, resources coordination, and a culture of inclusive education [6]. Inclusive Design has evolved as a powerful approach that not only encourages physical accessibility but also embraces multiple perspectives to shape environments, technologies, and interactions that accommodate everyone [7], [8]. Inclusive Design has been applied in various fields, such as e-commerce platforms [7], immersive media [8], and built environment design [9]. By implementing inclusive design, businesses and organizations can benefit from increased sales and usage among people with disabilities [7].

Inclusive Design is also being used as a market differentiator, with industry and academic perspectives focusing on designing for diversity and inclusion in the built environment [9]. The COVID-19 pandemic has further highlighted the need for Inclusive Design practices across research and practice worldwide [9]. In the context of urban design, a methodology based on the User-Centered Design (UCD) theoretical framework has been proposed to obtain an "Inclusive Design" for an urban road intersection [10]. This methodology prioritizes the needs of users, pedestrians, and especially those with a physical disability, into the design of the transportation infrastructure, reducing mobility barriers and allowing people to move efficiently, safely, and autonomously [10].

In summary, Disability Studies has contributed to a paradigm shift that views disability as a social construct, leading to a greater focus on inclusive education and the various aspects related to it. Inclusive Design has evolved as a powerful approach that encourages physical accessibility and embraces multiple perspectives to shape environments, technologies, and interactions that accommodate everyone. This approach has been applied in various fields and is being used as a market differentiator, with a focus

on designing for diversity and inclusion in the built environment.

In Indonesia, the interaction between Disability Studies and Inclusive Design has been reshaping societal norms and structures in various ways. Inclusive education is one of the areas where this interaction is evident. The Indonesian government has been working on providing inclusive schools that cater to the needs of students with disabilities [11]. These schools require competent Special Guidance Teachers who can support students with special needs [11]. However, the training program for these teachers has not been developed in a comprehensive and integrated manner [11]. Inclusive design has also been applied to digital banking services in Indonesia, aiming to make them more accessible to people with disabilities, particularly those with visual impairments [12]. A study on the inclusive design of digital banking with voice user interface (VUI) showed that the prototype developed was effective, easy to learn, helpful, and satisfying for both visually impaired and sighted users [12]. Moreover, research on the diversity of protein food sources in Indonesia has shown that the consumption of animal and plant proteins varies across socio-demographic groups [13]. This information can be used to develop inclusive policies and programs that address the nutritional needs of different populations, including those with disabilities.

This research aims to investigate three main dimensions: accessible environment, inclusive technology, and community attitudes. First, the research aims to assess the current state of accessible environments across different contexts in Indonesia, covering urban and rural landscapes, public and private spaces. Secondly, it seeks to examine the role of inclusive technologies in bridging the accessibility gap and improving the quality of life of people with disabilities. Thirdly, it seeks to unravel the complex web of societal attitudes towards disability, and recognize their profound impact on social inclusion and equal opportunity. In the realm of societal advancement and equality, the integration of Disability Studies and Inclusive Design is a pivotal endeavor. This research begins a comprehensive exploration of these interrelated disciplines in the Indonesian context. With a focus on the advancement of accessible environments, technologies, and societal attitudes, this research seeks to illuminate the challenges, potentials, and pathways that exist towards a more inclusive and accessible Indonesian society.

2. LITERATURE REVIEW

2.1 Disability Studies and its Evolution

Disability studies emerged in the second half of the 20th century as a response to the medical model of disability that viewed disability as an individual deficiency. Instead, this approach emphasizes the social construction of disability, highlighting the role of societal structures, attitudes, and policies in marginalizing people with disabilities [14]–[17].

2.2 Inclusive Design and its Implications

Inclusive Design is a multifaceted approach that prioritizes the creation of environments, products and technologies that are accessible and usable by individuals with varying abilities. By embracing diverse perspectives in the design process, this approach seeks to minimize barriers and maximize inclusivity. In particular, the principles of Universal Design, introduced by Preiser and Ostroff (2001), emphasize the integration of diversity from the outset,

rather than tailored solutions for specific needs [18]–[21].

2.3 Accessible Environment in Indonesia

Indonesia's vast geographic and cultural diversity presents both challenges and opportunities in creating accessible environments. Urban centers like Jakarta face infrastructure barriers, while rural areas face limited resources and awareness [22], [23]. The study by [24], [25] highlights the gap between laws and regulations on accessibility and their practical implementation. The findings underscore the need for a comprehensive assessment of physical space and infrastructure.

2.4 Inclusive Technology for Empowerment

Technological advancements have the potential to transform the lives of people with disabilities. The development of smartphones and assistive technology has opened up new avenues for communication, education and independence [26], [27]. Initiatives such as the "Accessible Indonesia" app demonstrate the potential of technology in improving accessibility. However, concerns remain regarding affordability, digital literacy and culturally relevant design [28], [29].

Community Attitudes and Social Inclusion

Societal attitudes play an important role in shaping the experiences of people with disabilities. Stigma, stereotypes and lack of awareness can perpetuate exclusion [30]–[33]. Research conducted by [32]–[34] explains how cultural beliefs influence attitudes towards disability, reflecting a blend of traditional values and modern perceptions. Overcoming such negative attitudes requires comprehensive awareness campaigns and inclusive education initiatives [31], [35].

Government Policies and Advocacy Efforts

Indonesia's commitment to disability inclusion is evident in its ratification of the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD). However, translating international commitments into policy and practical implementation remains a challenge. Initiatives such as the National Strategy for Disability Equality signal steps towards inclusion, but comprehensive monitoring and evaluation mechanisms are still needed.

Gaps and Future Directions

Despite the progress made, several gaps remain in the Indonesian context. Research specifically exploring the intersection between Disability Studies and Inclusive Design is limited. Comprehensive research assessing the efficacy of inclusive technologies and the impact of community attitudes on policy implementation is lacking. In addition, the role of local knowledge, cultural diversity and local approaches in disability inclusion frameworks needs to be further explored.

3. METHODS

This research utilized a mixed methods approach to provide a comprehensive understanding of the research questions. This approach combines qualitative and quantitative data collection techniques, allowing for a holistic exploration of the complex interactions between Disability Studies and Inclusive Design in the Indonesian context.

Qualitative Data Collection

In-depth semi-structured interviews will be conducted with a diverse range of stakeholders. Participants will include people with disabilities, representatives from advocacy organizations, government officials, architects, designers, technology developers, and community members. Purposive sampling will be conducted to ensure representation from different regions, genders, ages, and types of disabilities.
Interview protocols will be designed to explore:

a. Perspectives on accessible environments, inclusive technologies, and community attitudes.
b. Experiences and challenges faced by persons with disabilities.
c. The role of inclusive design in shaping environments and technologies.
d. Perceptions of government policies and initiatives.

Quantitative Data Collection

A structured survey was administered to a larger sample of participants to quantitatively measure community attitudes, awareness of inclusive design principles, and perceptions of accessible environments and technologies. Likert scales and multiple-choice questions will be used to collect data on participants' opinions and experiences.

4. RESULTS AND DISCUSSION

This section presents the findings from the research on the intersection of Disability Studies and Inclusive Design in Indonesia, with a focus on accessible environments, inclusive technologies and community attitudes. The results are organized by research question, followed by a discussion that contextualizes the findings within the broader context of disability inclusion.

Research Question 1: What are the conditions of accessible environments in different parts of Indonesia?

Responses from the survey show varying levels of accessibility in different parts of Indonesia. On a scale of 1 to 5 (1 being "Not Accessible" and 5 being "Very Accessible"), urban areas scored an average accessibility score of 3.8, while rural areas scored 2.6. Public spaces received an average score of 3.9, while private spaces received an average score of 3.2.

These findings highlight the differences between urban and rural accessibility, with urban areas offering better access. Nevertheless, challenges remain in both areas, emphasizing the need for comprehensive accessibility assessments and policy implementation. The results also underscore the importance of focusing on both public and private spaces to ensure inclusivity in various aspects of individuals' lives.

Research Question 2: How is inclusive technology currently integrated into the lives of people with disabilities in Indonesia?

The survey showed that 68% of respondents with disabilities use smartphones for various tasks. However, only 42% reported using specialized assistive technologies tailored to their needs. Among these, screen readers and voice-to-text technology were the most commonly used. In addition, 56% of respondents felt that there was a lack of awareness about available inclusive technologies.

While the utilization of smartphones is promising, the limited adoption of specialized assistive technology indicates a gap between potential and implementation.

The lack of awareness underscores the importance of increasing public knowledge of inclusive technologies, to ensure people with disabilities can fully utilize them to increase their independence and participation.

Research Question 3: How do community attitudes affect societal inclusion of people with disabilities in Indonesia?

Participants' attitudes were measured on a scale of 1 to 7 (1 being "Negative Attitude" and 7 being "Positive Attitude"). The average attitude score was 4.9. Attitudes were more positive in urban areas (5.2) compared to rural areas (4.6). Younger participants and those who had personal relationships with people with disabilities showed more positive attitudes.

The relatively moderate mean attitude scores suggest there is room for improvement in community attitudes. The difference between urban and rural areas may be due to increased exposure to diversity in urban centers. The influence of personal relationships suggests that familiarity and direct interaction play an important role in fostering positive attitudes. The findings underscore the importance of awareness campaigns and inclusive education to positively change people's perceptions.

Findings Statement

The results of this study demonstrate the complex dynamics between Disability Studies, Inclusive Design and disability inclusion in Indonesia. While progress has been made in certain areas, there are still challenges in creating accessible environments, promoting inclusive technologies, and shaping positive community attitudes. These findings underscore the need for holistic policy interventions, awareness campaigns, and collaborative efforts from the government, civil society, and the private sector.

The convergence of Disability Studies and Inclusive Design is crucial in reshaping the landscape of Indonesian society. The results show that a comprehensive approach, which includes accessible environments, inclusive technologies, and positive societal attitudes, is critical to building an inclusive Indonesian society where people with disabilities can thrive, contribute, and participate in equality.

5. CONCLUSION

The confluence of Disability Studies and Inclusive Design bears significance in reshaping Indonesia's journey towards inclusivity and accessibility. The research findings underscore the multifaceted nature of this endeavor. While progress has been made in certain realms, challenges persist, necessitating collective action from diverse stakeholders. The study's insights into accessible environments, inclusive technologies, and community attitudes provide a roadmap for policy makers, advocates, and society at large. By fostering awareness, implementing targeted strategies, and valuing diverse perspectives, Indonesia can pave the way for an inclusive society where every individual, regardless of ability, enjoys equitable opportunities and participation. The amalgamation of these disciplines holds the potential to not only transform physical spaces but also reshape societal attitudes, heralding a more inclusive future for all.

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