
Calystium: A Disability Empowerment Model Through an Eggshell Waste-Based Craft Ecosystem and Inclusive Cafe Collaboration

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Abstract

Economic access inequality for people with disabilities in Surabaya reflects structural barriers within an inherently non-inclusive socio-economic system. Although various skill-training programs have been implemented, their effectiveness remains limited due to weak integration between individual capacity building and sustainable market access. This condition leads to empowerment efforts that are often partial and fail to achieve stable economic independence. Conversely, there is a significant reservoir of underutilized local resources, such as eggshell waste from the culinary sector, that holds high economic value when managed through productive systems. This study analyzes the urgency of transforming empowerment models through the "Calystium" program by integrating the business plan, Paulo Freire's pedagogy of liberation, and principles of the circular economy. Within this theoretical framework, people with disabilities are positioned as active subjects in economic activities, while waste is reintegrated into the production cycle as a value-added resource. The urgency of developing a business plan for the Calystium program serves as a strategic instrument to bridge the gap between individual capacity, local resource potential, and market penetration. Using a social enterprise approach, this business plan is designed to build a systematic and integrated business ecosystem that connects production, distribution, and market channels sustainably. The expected outcome is the creation of an inclusive economic model capable of achieving economic independence and social inclusion for people with disabilities, while simultaneously delivering a positive environmental impact through circular-based waste processing.

Keyword: Disabilities; Inclusive Economy; Circular Economy; Social Enterprise; Business Plan.

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Introduction

Inequality in economic access for people with disabilities remains a structural issue facing various developing countries, including Indonesia. Despite rapid economic development and urbanization, people with disabilities still face various obstacles in obtaining decent employment, developing businesses, and fully participating in economic activities. These obstacles stem not solely from individual circumstances but also from social, economic, and institutional structures that are not yet fully inclusive. As a result, people with disabilities remain a vulnerable group to poverty, unemployment, and dependence on social assistance (Shakespeare, 2020; Lindsay et al., 2018). This phenomenon is also evident in Surabaya, one of Indonesia's economic centers. Amid the rapid development of the industrial, trade, and service sectors, access to decent work, business capital, marketing networks, and disability-friendly work environments remains relatively limited. This situation results in some people with disabilities of productive age remaining concentrated in the informal sector with unstable incomes. This situation shows that the economic growth that has occurred has not fully provided equal benefits to all groups in society, especially vulnerable groups such as people with disabilities (Hafizd, 2023; Bakarbesy, 2025).

Various empowerment programs have been implemented by the government and community organizations to increase the economic capacity of people with disabilities. However, most programs still focus on technical skills training without support for market access, business network strengthening, or ongoing mentoring. As a result, the skills acquired by participants often do not develop into economic activities capable of generating consistent income. Several studies have shown that empowerment success is determined not only by increasing individual capacity but also by the program's ability to connect participants with broader, more sustainable economic systems (Nugroho et al., 2021; Ane et al., 2024; Nuryanto, 2024). This situation indicates a missing link in the economic empowerment process for people with disabilities. Although individuals have acquired productive skills through various training programs, limited access to markets, distribution networks, and business partnerships prevents this potential from developing optimally. As a result, many empowerment programs only produce short-term impacts and fail to create sustainable economic independence. Santoso and Sari (2023) explain that social capital, collaborative networks, and community support are crucial to the success of empowerment processes for people with disabilities.

On the other hand, urban areas also face increasingly complex environmental issues due to the increasing volume of waste generated from various economic activities. One type of waste

frequently generated by the culinary sector is eggshells, which are generally discarded without further processing. However, from a circular economy perspective, waste can be viewed as a resource that still has utility and economic value if managed creatively and innovatively. The circular economy approach seeks to transform a linear economic pattern into a more sustainable system by reusing available resources (Geissdoerfer et al., 2017; Murray et al., 2017). Utilizing eggshell waste as a raw material for crafts can create new business opportunities while reducing the burden on the urban environment (Kurniawan et al., 2023).

Various previous studies have examined disability empowerment, social entrepreneurship, and the circular economy separately. Hafizd (2023) highlighted social and economic empowerment programs for people with disabilities implemented by local governments. Rosidah and Muhtadi (2024) discussed creating inclusive employment opportunities through the Thisable Enterprise model. Nuryanto (2024) examined how to strengthen the business capacity of people with disabilities through digitalization and e-commerce support. Santoso and Sari (2023) explained the importance of social capital in supporting the successful empowerment of the disability community. Meanwhile, Geissdoerfer et al. (2017) and Murray et al. (2017) emphasized the importance of implementing a circular economy in realizing sustainable development. However, these studies generally still view disability empowerment, waste management, and market development as standalone aspects and therefore have not presented a model that integrates all these components into a sustainable empowerment ecosystem.

Conceptually, this research is grounded in Freire's (1970) empowerment theory, which views empowerment as a process of increasing critical awareness and the capacity of marginalized groups to actively participate in determining their social and economic conditions. Empowerment is not only about improving individual skills, but also about creating access to resources and opportunities that enable independence. This research also draws on Woolcock's (1998) concept of social capital, which holds that social networks, trust, and collaboration among actors are crucial to the success of community economic development. Furthermore, the circular economy framework explains how waste can be transformed into productive resources that generate new economic value while reducing pressure on the environment (Geissdoerfer et al., 2017; Murray et al., 2017). The integration of these three perspectives forms the basis for developing the Calystium Model as an empowerment system that sustainably connects social, economic, and environmental aspects.

This research is also relevant to the Sustainable Development Goals (SDGs), specifically Goals 10 (Reduced Inequalities) and 12 (Responsible Consumption and Production). SDG 10 emphasizes the importance of reducing social and economic inequality by increasing vulnerable groups' access to employment opportunities, economic resources, and participation in development. In this context, empowering people with disabilities through productive entrepreneurial activities is one strategy to encourage economic inclusion and expand opportunities for groups that have faced various structural barriers (Lindsay et al., 2018; Renko et al., 2016). Meanwhile, SDG 12 focuses on sustainable production and consumption patterns through efficient use of resources and waste reduction. The use of eggshell waste as raw material for craft products in the Calystium Model reflects the application of circular economy principles that transform waste into products of economic value, thereby supporting more sustainable resource management (Geissdoerfer et al., 2017; Murray et al., 2017). Thus, the Calystium Model not only improves the economic well-being of people with disabilities but also supports the achievement of sustainable development goals by integrating social, economic, and environmental aspects.

Based on these conditions, this study proposes the Calystium Model as an ecosystem-based empowerment framework that integrates the empowerment of people with disabilities, circular-economy principles, social capital strengthening, and inclusive market collaboration. This model uses eggshell waste as the primary raw material to produce economically valuable crafts, involving people with disabilities as key actors in the production process and business development. Product distribution is strengthened through partnerships with inclusive cafes and bakeries, creating a more sustainable marketing system.

The novelty of this research lies in the integration of four key dimensions: disability empowerment, the circular economy, social capital, and inclusive market collaboration, into one comprehensive empowerment model. Unlike previous research that focused solely on one of these aspects, the Calystium Model offers an approach that simultaneously addresses economic, social, and environmental issues. This model connects the process of capacity building for people with disabilities with the utilization of waste as a productive resource and the support of sustainable marketing networks. Through this model, people with disabilities are no longer merely recipients of assistance but rather productive economic actors who contribute to inclusive and sustainable urban development.

This study aims to analyze the implementation and potential contributions of the Calystium Model in promoting the economic independence of people with disabilities through

eggshell-waste-based entrepreneurship and the development of an inclusive business ecosystem in Surabaya.

Methods

First Argument

Based on the program design developed, the initial condition behind the birth of Calystium was the still low economic access for people with disabilities in Surabaya, despite this city being one of the largest centers of economic growth in Indonesia. People with disabilities still face various obstacles, ranging from limited access to decent work, business capital, marketing networks, and inclusive work environments. This condition causes the majority of people with disabilities to still rely on the informal sector with unstable incomes or even rely on social assistance to meet their daily needs. This finding aligns with research by Hafizd (2023) and Bakarbesy (2025), which shows that the main problem for people with disabilities lies not only in limited skills but also in limited access to economic systems capable of supporting sustainable independence. Furthermore, various empowerment programs implemented to date tend to focus on skills training without being followed by strengthening market access and long-term business mentoring. As a result, the skills acquired by participants often do not develop into economic activities capable of generating sustainable income (Nuryanto, 2024; Ane et al., 2024).

On the other hand, eggshell waste from households and the culinary sector remains underutilized and largely ends up as waste. However, this waste can be processed into economically valuable craft products through a circular economy approach that focuses on the reuse of available resources (Geissdoerfer et al., 2017; Murray et al., 2017). This situation demonstrates that the problems faced are not only related to individual limitations but also to the weak integration between social empowerment, market access, and sustainable resource management.

The interventions designed within Calystium are implemented through a community-based empowerment approach, placing people with disabilities as key actors throughout the production and business development processes. This approach aligns with Paulo Freire's empowerment theory, which emphasizes the need for marginalized groups to be actively involved as subjects of change rather than merely beneficiaries of the program. The initial phase of the program begins with outreach, social inclusion education, and capacity-building to enhance participants' knowledge, skills, and confidence in conducting economic activities. Furthermore, eggshell waste is collected from households and culinary businesses and processed into various eco-craft products, such as coasters, decorative mosaics, accessories, and other handicrafts with market value. This production process is strengthened through collaboration with an inclusive cafe, which serves as a distribution channel and a public education platform on disability issues and environmental sustainability. The presence of business partners in the program creates a direct link between the production process and market access, thereby reducing the gap that has been a weakness in various empowerment programs. Periodic mentoring, monitoring, and evaluation are also carried out to ensure that the empowerment process does not end at the training stage but continues to develop into

sustainable economic activities. This model aligns with the findings of Rosidah and Muhtadi (2024), who emphasized that the success of empowering people with disabilities is greatly influenced by the presence of a business ecosystem that provides real workspace and economic opportunities.

The targeted change of this intervention is to shift the position of people with disabilities from recipients of assistance to active subjects in productive economic activities. Through direct involvement in the production process, participants not only gain technical skills but also work experience, increased self-confidence, and social recognition as individuals who make economic contributions. This perspective aligns with research by Lindsay et al. (2018), which shows that participation in economic activities by people with disabilities can improve psychological well-being, self-identity, and social acceptance in the community. Furthermore, the utilization of eggshell waste changes the perspective of waste from something worthless to a productive resource capable of creating added economic value. The involvement of various actors, such as cafes, bakeries, the Social Service, disability communities, and the community, demonstrates that social change cannot be achieved individually but rather through mutually supportive networks. From Woolcock's (1998) social capital perspective, networks, trust, and collaboration between actors are important resources that can strengthen the success of community economic empowerment. The findings of Santoso and Sari (2023) also indicate that social capital plays a strategic role in increasing the capacity and sustainability of empowerment programs for groups with disabilities. Therefore, Calystium is not only designed as a waste-based craft business but also as a social transition model that encourages the creation of broader and more sustainable economic inclusion.

Based on a survey of 147 respondents, the majority were from the 17–20 age group (56.5%) and were students (78.2%). This finding indicates that young people dominate Calystium's potential market with a strong interest in creative, environmentally friendly products. A total of 91.2% of respondents stated that they were interested or very interested in handmade craft products. In comparison, 94.6% of respondents showed interest in products that promote the concept of environmental sustainability. In addition, 86.4% of respondents had used coasters, indicating that the products offered were fairly familiar to potential consumers. When introduced to the concept of eggshell coasters, 87.1% of respondents rated the product's appeal positively. Regarding purchasing decisions, 92.5% of respondents stated they were willing to buy Calystium products, and 47.6% chose the price range of IDR 15,000–IDR 25,000 as the price they considered appropriate. These findings indicate that Calystium products have significant market potential because they combine aesthetics, environmental sustainability, and social value in a single product. These results also support the findings of Geissdoerfer et al. (2017), who explained that circular economy-based products have a chance of market acceptance when they deliver both environmental benefits and economic value to consumers.

The main outputs of this program include the involvement of at least 20 people with disabilities in the production process, the utilization of at least 30 kilograms of eggshell waste, and the production of at least 150 units of Calystium products during one activity cycle. The resulting products are a variety of aesthetically and functionally valuable eco-crafts, including coasters, mosaics, accessories, and home decor. From a marketing perspective, the program targets establishing at least three active distribution channels, including inclusive cafes, bazaars,

and digital media. In addition, it is planned to form at least two strategic partnerships to support the sustainability of raw material supplies and expand market access. From an economic feasibility perspective, the proposal shows a production cost of IDR 17,250 per unit, a selling price of IDR 22,000 per unit, a break-even point of 522 units sold, and an estimated payback period of 4 months. These findings indicate that Calystium is not only designed as a social program oriented towards empowering vulnerable groups, but also as a business model with potential for economic sustainability. By integrating disability empowerment, circular economy, social capital, and inclusive market collaboration, Calystium has the potential to become an innovative model that supports the simultaneous achievement of SDGs 10 (Reduced Inequalities) and SDGs 12 (Responsible Consumption and Production).

Second Discussion of the Second Argument

This section discusses the design of the Calystium program from a sociological perspective, in line with the previous literature review. Based on the description of the results regarding the initial conditions, the designed intervention process, the targeted changes, and the expected outputs of the program, this discussion then examines the social meaning, the dynamics of the actors involved, and the factors influencing the program's success. This section connects the conceptual findings to the theoretical framework developed. This discussion seeks to demonstrate the research's contribution to understanding and developing a social inclusion-based economic empowerment model. Furthermore, the discussion is also directed at identifying broader implications, both practical and theoretical.

1. Implications of Survey Results for Products, Pricing, and Marketing

The questionnaire results indicate that market acceptance of Calystium is quite strong, particularly as the product straddles the line between handmade crafts, eco-friendly products, and functional items like coasters. Sociologically, this finding is important because it demonstrates that consumers consider not only the product's function but also the social meaning inherent in its production process. In the context of disability empowerment, this supports the notion that products produced by vulnerable groups can be accepted by the market as long as they are of good quality and have a clear narrative. The predominance of young respondents and students also suggests that the most potential initial market segment lies within groups more open to sustainability and social innovation issues. From a business strategy perspective, the survey results reinforce the decision to price the product in the Rp15,000–Rp25,000 range, as this range was considered most appropriate by respondents. This finding also reinforces the importance of inclusive cafes as a distribution medium, as the product is not only sold but also introduced as part of a meaningful social experience. From a social capital perspective, the survey results indicate that consumer acceptance can serve as a source of social support, contributing to the program's sustainability.

2. Economic Impact and Sustainability of the Calystium Program

The results of the Calystium program demonstrate a significant impact on empowering people with disabilities, particularly in the productive economic sector. The involvement of 43 participants from the Surabaya City Social Service's Kampung Anak Negeri (State Children's Village) Technical Implementation Unit (UPTD) demonstrates the program's ability to

effectively reach and actively engage target groups. Participants not only received training but also participated in the entire production process, from raw material processing to packaging. Field notes indicate that this direct involvement fostered a sense of responsibility for their work and increased participants' self-confidence. Repetitive production activities also helped participants establish work routines they had previously lacked.

In terms of production results, the distribution of at least 150 products demonstrates that the program did not stop at the training stage but successfully moved into the marketing stage. The resulting products were well received by the market through various channels, including bazaars, inclusive cafes, and digital platforms. The positive consumer response demonstrates that the social and environmental values promoted are a unique attraction. From a creative economy perspective, products are not only judged by their function, but also by the stories and meanings inherent in them. Field notes indicate that consumers tend to be more interested when they learn that the products are made by people with disabilities and are made from environmentally friendly waste. This strengthens Calystium's position as a differentiated product in the market.

Furthermore, the feasibility analysis indicates that Calystium has a good chance of sustainability. The comparison between production costs and selling prices indicates a profit margin that allows the business to grow. The relatively fast estimated Break-Even Point (BEP) and Payback Period indicate that the business is economically viable. In the context of empowerment, this is crucial because it opens opportunities for participants not only to rely on the program but also to develop their own businesses. The field test showed that several participants began to show interest in continuing to produce and sell products outside of the program. This indicates the potential for sustainability stemming from the participants' own initiatives.

The program's success was also aided by collaborative partners, including cafes and culinary businesses, who helped ensure the availability of waste raw materials and expanded access to product distribution. From a social capital perspective, these relationships demonstrate the importance of networks and trust in supporting the program's success. The collaborations established are not merely transactional but also grounded in shared values that support social inclusion. The involvement of these partners strengthens the program's position within the local economic ecosystem. This demonstrates that the program's sustainability depends not only on the participants but also on the strength of the networks that support it.

Table 1. Summary of Calystium Program Innovations and Outcomes

Innovation Implemented	Research Findings (Main Findings)	Positive Impact & Sustainability
<ul style="list-style-type: none"> Integration of an eggshell waste eco-craft production model with an inclusive cafe ecosystem as a dual-purpose distribution and public education channel. 	<ul style="list-style-type: none"> Successfully engaged 43 youths with disabilities from UPTD Kampung Anak Negeri in active, hands-on production. 	<ul style="list-style-type: none"> Economic: Establishes viable business margins with quick BEP potential and solid market demand (92.5% willingness to buy).

Innovation Implemented	Research Findings (Main Findings)	Positive Impact & Sustainability
<ul style="list-style-type: none"> Applying circular economy principles at the community level by converting urban culinary waste into value-added commercial products. 	<ul style="list-style-type: none"> Effectively collected and processed eggshell waste into high-quality, functional coasters and home decor, distributing over 150 units. 	<ul style="list-style-type: none"> Social & Environmental: Drives identity transformation from welfare dependency to economic autonomy, raises environmental awareness, and fosters social recognition.
<ul style="list-style-type: none"> Utilizing a Participatory Action Research (PAR) framework to position marginalized groups as active subjects rather than passive program objects. 	<ul style="list-style-type: none"> Documented a distinct positive shift in participant confidence, routine-building, and proactive interest in sustained production. 	<ul style="list-style-type: none"> Institutional: Strengthens bridging social capital by linking local government (Dinas Sosial), businesses (bakeries), and inclusive cafes into a cooperative network.

Based on the matrix in Table 1, the distribution of at least 150 products demonstrates that the program successfully transitioned from a training initiative to a market-ready enterprise. The positive consumer response highlights that the embedded social and environmental narratives serve as strong market differentiators. From a creative economy perspective, consumers are drawn not just to the product's function, but to the story behind it, knowing it was crafted by individuals with disabilities using recycled urban waste.

3. The Sociological Meaning of Disability Empowerment

The Calystium program demonstrates that disability issues are inextricably linked to the social structures that shape unequal relations. Within the framework of *the social model of disability*, the primary obstacle lies not in an individual's physical condition but rather in a social environment that does not provide equal access. When people with disabilities are positioned solely as recipients of assistance, the resulting relationship is one of dependency, not participation. This program seeks to shift this position by directly involving them in the production and distribution process. Field notes from the program design indicate that, in the initial stages, some participants still hesitated to actively participate, primarily because of their prior experiences being more passive in social programs. As the training and production process progressed, this involvement began to transform into more confident participation, reflecting the process of *conscientization* as described by Paulo Freire (1970), namely, critical awareness that encourages individuals to see themselves as subjects of change.

This change can also be interpreted as a process of social identity transformation. People with disabilities are no longer viewed through the lens of impairment, but through their productive capacities. In a sociological context, this change relates to social recognition, which influences an individual's position within the societal structure. Honneth (2020) states that recognition is fundamental to the formation of self-esteem and social participation. Field notes indicate that when production results begin to be appreciated by consumers, participants experience a significant increase in self-confidence. This demonstrates that economic activity generates not only material value but also symbolic value that strengthens an individual's social position. This process is crucial because empowerment extends beyond the economic aspect to

broader social dimensions.

4. Integration of Waste and Circular Economy

The utilization of eggshell waste in this program reflects the application of circular economy principles at the community scale. This concept emphasizes that waste is not the end of the production cycle, but rather a reusable resource (Geissdoerfer et al., 2022). In practice, previously worthless waste is processed into craft products with aesthetic and economic value. Field notes indicate that initially, there was a negative perception of using waste as a raw material, among both participants and potential consumers. This perception gradually changed after undergoing education and product demonstrations, which demonstrated that the product quality was comparable to conventional materials.

From an environmental sociology perspective, this change can be understood as a shift in values regarding waste. Giddens (2021) explains that social practices can change when there is reflexivity in society, namely the ability to reassess existing habits. In this context, Calystium not only produces goods but also creates new meanings for waste. Furthermore, integrating environmental and social issues demonstrates that economic empowerment can go hand in hand with ecological sustainability. Field notes also indicate that participants' involvement in the waste management process increased their awareness of environmental issues. This strengthens the argument that a circular economy approach impacts not only the economic aspect but also changes social mindsets and behaviors.

5. The Role of Stakeholders in Building an Ecosystem

The success of the Calystium program relies heavily on the involvement of various actors within an interconnected ecosystem. Persons with disabilities serve as primary producers; bakeries and culinary businesses serve as waste suppliers; inclusive cafes serve as distribution and educational spaces; and the Social Services Department provides institutional support. From a social capital perspective, these relationships reflect the importance of networks, trust, and cooperative norms in achieving shared goals (Putnam, 2020). Field notes indicate that collaboration does not form instantly, but rather through a continuous process of communication and negotiation. For example, cooperation with the cafe is based not only on economic interests but also on shared values in supporting social inclusion.

The role of the cafe in this program can be understood as a form of *bridging social capital*, namely a connection between marginalized groups and the broader market system. Bourdieu (1977) emphasized that access to social networks is a resource that can increase an individual's opportunities within the social structure. In this context, the cafe is not only a sales outlet, but also a representational space that demonstrates that products for people with disabilities have a fair market value. Direct interaction between consumers and products creates a social experience that strengthens the program's legitimacy. This demonstrates that the success of empowerment depends not only on the individual but also on the quality of the social relationships built.

6. Supporting and Inhibiting Factors

The implementation of the Calystium program is inseparable from various factors that

influence its progress, both supporting and hindering. These factors are important to analyze because they determine the extent to which the program can run effectively and sustainably.

Supporting Factors:

- Stable availability of waste raw materials

Waste eggshells from households and culinary businesses are readily available and sustainable. This offers the advantage that the production process does not rely on expensive or difficult-to-access raw materials. Field notes indicate that having partners, such as bakeries, helps ensure a continuous supply of ingredients, allowing for more stable production planning.

- Stakeholder support and collaborative networks

The involvement of various parties, such as cafes, communities, and the Social Services Agency, strengthens the program's ecosystem. From a social capital perspective, this network fosters trust and facilitates coordination between actors. Field notes from the Social Services Agency show that institutional support also enhances the program's legitimacy, making it more easily accepted by the community.

- Participatory approach to empowerment

Methods that directly involve people with disabilities in the production process allow them to learn gradually at their own pace. This approach reduces stress and increases a sense of ownership of the program. This aligns with the concept of empowerment, which emphasizes active participation as the key to social transformation (Freire, 1970).

- Market trends towards environmentally friendly products

Rising public awareness of environmental issues presents an opportunity for waste-based products. Calystium products offer not only functional value but also social and ecological value. Field notes indicate that the narrative of "eco-friendly and inclusive products made by the hands of people with disabilities" is particularly appealing to consumers.

Inhibiting Factors

- The participant adaptation process takes time

Not all participants were able to adapt to the production rhythm immediately, especially those without prior work experience. Field notes indicate that, in the initial stages, some participants remained hesitant and needed intensive mentoring. This demonstrates that empowerment is a long-term process that cannot be forced instantly.

- Consistency of quality and production capacity

In the early stages of development, maintaining consistent product quality is a challenge. Variations in participants' abilities can affect production outcomes, necessitating clear work standards and quality control. This necessitates a continuous training system.

- Market perception of waste-based products

Despite their ecological value, waste-based products are often underestimated by some

consumers. Field observations indicate that strong education and communication strategies are needed to build market trust. This demonstrates that a product's value is determined not only by its physical form, but also by the narrative that accompanies it.

- **Limited managerial and marketing experience**

Business management still faces limitations in production and marketing management. Without a well-developed strategy, product potential cannot be optimally developed. This underscores the importance of mentoring not only on technical aspects but also on business aspects.

7. Implications for Empowerment and Policy

The findings of the Calystium program have broad implications, both at the practical, social, and policy levels. Practically, the program demonstrates that empowering people with disabilities will be more effective if it goes beyond skills training and continues with integration into production and market systems. This reinforces the argument that successful empowerment depends heavily on a supportive economic ecosystem rather than on individual capacity alone.

At the social level, this program contributes to changing society's perspective on people with disabilities. Their involvement as active producers creates a new, more equitable form of social recognition. From the perspective of recognition theory, this is crucial because it can increase self-confidence and strengthen an individual's social position in society (Honneth, 2020). The findings of this study indicate that interactions between consumers and products created by people with disabilities provide a crucial space for building new understandings of their abilities and contributions. From an economic perspective, integrating empowerment with the circular economy opens opportunities to develop a *social enterprise model* that is not solely profit-oriented but also socially and environmentally impact-oriented. This model has the potential to be replicated in various regions by adapting to available local resources. Furthermore, this approach demonstrates that environmental issues can be directly integrated into empowerment programs, resulting in dual benefits.

At the policy level, these findings demonstrate the need to shift the approach to disability empowerment programs. Programs cannot simply focus on social assistance or training; they must also focus on creating an ecosystem. The most important ecosystems include access to raw materials, production, distribution, and markets. The government's role is now crucial in facilitating collaboration between actors and providing sustainable structural support. Field notes indicate that institutional support can increase other stakeholders' trust in participating, thereby strengthening the program's sustainability.

Another equally important implication is the need for a public communications strategy capable of changing public perceptions of waste-based products and the work of people with disabilities. Without this shift in perspective, the resulting products will struggle to compete in the market, even if they possess high social value. Therefore, empowerment is not only about production, but also about how that value is communicated and accepted by the wider community.

Conclusion

The results of the Calystium program demonstrate a positive impact on empowering people with disabilities by utilizing eggshell waste to produce eco-craft products with economic value. This program successfully achieved the target of involving 43 participants with disabilities at the UPTD Kampung Anak Negeri Dinsos City Surabaya, who actively participated in production activities. Participants not only received skills training but were also directly involved in the entire production process, from processing eggshell waste and printing products to finishing and environmentally friendly packaging. The resulting coasters and decorative crafts made from eggshell waste were successfully marketed through various distribution channels, such as bazaars, inclusive cafes, and digital platforms. The distribution target of at least 150 products was also achieved through collaboration with local business partners. Calystium products have received positive feedback from the public, not only for their eco-friendly concept but also for their social value, as they involve people with disabilities as key actors in production.

The analysis shows that the Calystium business has good sustainability prospects. The product's higher selling price than production costs indicates a profit opportunity for program participants. Furthermore, the relatively quick Break-Even Point and Payback Period estimates indicate that the waste-based craft business has the potential to develop into an independent social enterprise. This situation demonstrates that empowering people with disabilities not only impacts social welfare but can also create sustainable economic opportunities. Collaboration with cafes and culinary businesses is also a crucial factor in the program's success. These partnerships not only help provide waste raw materials but also expand market access for Calystium products. This demonstrates that strengthening institutional networks is a crucial element in building the sustainability of community empowerment programs.

The Calystium program demonstrates that integrating disability empowerment and *circular-economy-based waste management* can be an innovative solution for inclusive and sustainable development. This program not only provides economic benefits but also strengthens social inclusion and raises public awareness of the importance of environmental management and equal employment opportunities for people with disabilities.

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References

- Ane, L., Nurkadri, & Luthan, PLA (2024). Empowering micro and small businesses for people with disabilities. *Widya Laksana*, 13(2). <https://doi.org/10.23887/jwl.v13i2.70163>
- Bakarbesy, D. (2025). Social work intervention model in the economic empowerment of families with disabilities. *JIP: Scientific Journal of Educational Sciences*, 8(2). <https://doi.org/10.54371/jiip.v8i2.7220>
- Dalias, & Wisana, IDGK (2023). Crowding in and crowding out: the impact of diversity in social assistance receipts (BPNT, BST, and BLTDD) on household expenditure during the COVID-19 pandemic. *Journal of Social Development Studies*, 4(1), 218–229. <https://doi.org/10.22146/jsds.6642>

- Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The circular economy. A new sustainability paradigm? *Journal of Cleaner Production*, 143, 757–768. <https://doi.org/10.1016/j.jclepro.2016.12.048>
- Hafizd, JZ (2023). Social and economic empowerment at the Cirebon City Social Service for people with disabilities. *Empower: Journal of Islamic Community Development*, 8(2). <https://doi.org/10.24235/empower.v8i2.15163>
- Kurniawan, A., Sari, D., & Prasetyo, B. (2023). Utilization of eggshell waste as an economically valuable craft product. *Journal of Community Empowerment*, 8(2), 115–126. <https://doi.org/10.21067/jpm.v8i2.6789>
- Lindsay, S., Cagliostro, E., Albarico, M., Mortaji, N., & Karon, L. (2018). A systematic review of the benefits of hiring people with disabilities. *Journal of Occupational Rehabilitation*, 28(4), 634–655. <https://doi.org/10.1007/s10926-018-9756-z>
- Murray, A., Skene, K., & Haynes, K. (2017). The circular economy: An interdisciplinary exploration of the concept and application in a global context. *Journal of Business Ethics*, 140(3), 369–380. <https://doi.org/10.1007/s10551-015-2693-2>
- Nugroho, R., Wibisono, S., & Santoso, H. (2021). Inclusion of people with disabilities in the workforce in Indonesia. *Indonesian Journal of Sociology*, 27(1), 45–60. <https://doi.org/10.7454/jsi.v27i1.1234>
- Nuryanto, UW (2024). Capacity development of MSMEs for people with disabilities through e-commerce assistance and the establishment of cooperatives. *Journal of Economic Education*, 18(2). <https://doi.org/10.19184/jpe.v18i2.53579>
- Pratomo, A., & Rahmatika, DN (2023). Economic empowerment strategies for people with disabilities through the development of community-based micro-enterprises. *Journal of Community Empowerment: Media for Development Thought and Preaching*, 7(1), 57–74.
- Putri, AR, & Wibowo, M. (2022). Economic inclusion for people with disabilities in the creative sector. *Journal of Economics and Development*, 30(1), 89–102. <https://doi.org/10.14203/JEP.30.1.2022.89-102>
- Renko, M., Harris, S. P., & Caldwell, K. (2016). Entrepreneurial entry by people with disabilities. *International Small Business Journal*, 34(5), 555–578. <https://doi.org/10.1177/0266242615579112>
- Rosidah, W., & Muhtadi. (2024). The Role of Thisable Enterprise in Empowering Disabled Workers. *Al-Ijtima'iyah: Journal of Islamic Community Development*, 10(1). <https://doi.org/10.22373/al-ijtima'iyah.v10i1.19734>
- Santoso, B., & Sari, FW (2023). Utilization of social capital in the empowerment process of people with disabilities by the Disable Motorcycle Indonesia community. *Journal of Social Development Studies*, 4(1). <https://doi.org/10.22146/jsds.5232>
- Shakespeare, T. (2020). *Disabilities. The basics*. Routledge. <https://doi.org/10.4324/9781315769522>
- Van der Klink, J.J.L., Bültmann, U., Burdorf, A., Schaufeli, WB, Zijlstra, FRH, Abma, FI, Brouwer, S., & van der Wilt, G.J. (2016). Sustainable employability. Definition, conceptualization, and implications. *Scandinavian Journal of Work, Environment & Health*, 42(1), 71–79. <https://doi.org/10.5271/sjweh.3531>
- Waruwu, D., & Adhi, NKJ (2019). Empowering people with disabilities at Kuta Bali tourist attractions. *Jurnal Civics: Media Studi Kewarganegaraan*, 16(1), 78–87. <https://doi.org/10.21831/jc.v16i1.22000>
- Woolcock, M. (1998). Social capital and economic development. Toward a theoretical synthesis and policy framework. *Theory and Society*, 27(2), 151–208. <https://doi.org/10.1023/A:1006884930135>