

The impact of feasibility and meaningfulness of ESD activities on sustainability awareness in Japanese community learning centers

Khalaf Mohamed Abdellatif*

Faculty of Graduate Studies for Education, Cairo University, 1 Gamaa Street, Giza 12613, Egypt

*Corresponding author, email: khalaf.mohamed@cu.edu.eg

Article History

Received: 10 July 2025

Revised: 15 August 2025

Accepted: 20 August 2025

Published: 1 September 2025

Keywords

Community Learning Centers (CLCs)

Education for Sustainable Development (ESD)

Feasibility

Meaningfulness

Sustainability Awareness

Abstract

Although feasibility (practical accessibility) and meaningfulness (personal relevance) are established drivers of participation in non-formal education, their direct impact on learning outcomes, specifically sustainability awareness within Japanese Community Learning Centers (CLCs), has not been empirically established. This research addresses this research gap by examining how perceived feasibility and meaningfulness of Education for Sustainable Development (ESD) activities affect sustainability awareness among participants in CLC in Japan. Using a mixed-methods case study approach, quantitative data were collected from 370 participants at Misonou Community Center in Hiroshima and analyzed through structural equation modeling (SEM), complemented by qualitative insights from 30 follow-up interviews. Results indicated that both feasibility ($\beta = 0.32$, $p < .001$) and meaningfulness ($\beta = 0.48$, $p < .001$) significantly predicted sustainability awareness, collectively explaining 56% of variance, with meaningfulness showing stronger predictive power. These findings provide an empirically validated framework for ESD program design, suggesting that practitioners should adopt a dual-focused strategy that reduces logistical barriers while collaboratively developing curricula that reflect local contexts and participant values. This evidence-based approach enables CLCs to effectively support national sustainability objectives and promote environmental consciousness.

How to cite: Abdellatif, K. M. (2025). The impact of feasibility and meaningfulness of ESD activities on sustainability awareness in Japanese community learning centers. *Journal of Environment and Sustainability Education*, 3(3). 435-443. doi: 10.62672/joease.v3i3.140

1. Introduction

Community Learning Centers (CLCs) in Japan are foundational pillars of social education and lifelong learning, established post-World War II to support democratic reconstruction and community revitalization through providing opportunities for community-based learning (Arai & Tokiwa-Fuse, 2013). These centers have evolved into crucial venues for Education for Sustainable Development (ESD), addressing local and global sustainability challenges through non-formal, community-based learning (Abe, 2014; Noguchi et al., 2015). In Japan, a global leader in ESD implementation, CLCs facilitate participatory learning that connects environmental integrity, economic viability, and social justice to daily life (Maruyama, 2010; UNESCO, 2014; Abdellatif 2020). Despite this significant role, empirical research on the specific mechanisms through which community-based learning activities influence participants' sustainability awareness remains underdeveloped.

Prior research has established that the participation of adult learners in non-formal education is driven by a complex set of factors. Abdellatif (2021) identified that the feasibility (practical accessibility) and meaningfulness (personal relevance) of learning activities are primary determinants of engagement in CLCs' activities. This aligns with broader adult learning theories; Knowles, Holton III, & Swanson (2005) emphasize that adults are pragmatic learners motivated by life-centered and relevant learning, while Lau & Tov (2023) highlight the role of appraisals in the meaning-making process. However, the current literature shows a significant gap: while feasibility and meaningfulness are linked to participation in learning activities, their direct effect on learning outcomes, specifically sustainability awareness—defined as the knowledge, attitudes, and behavioral intentions related to sustainable development (Brundtland, 1987; Purvis et al., 2019)—has not been quantitatively established. Although the literature explains the role of feasibility and meaningfulness on participation, the direct relationship to sustainability awareness has not been empirically tested. Research on ESD in Japan has largely focused on policy and practice descriptions (Nomura & Abe, 2009; Tanaka, 2017), leaving a lack of empirical evidence on the psychosocial drivers of its effectiveness within the unique CLCs context.

This research addresses this critical gap by pivoting the research focus from participation drivers to educational outcomes. Investigating how feasibility and meaningfulness directly cultivate sustainability

awareness is essential for optimizing community-based learning programs to contribute effectively to Japan's national sustainability goals, including its pledge for carbon neutrality by 2050 (MoFA, 2018). The findings will provide CLCs' administrators, social education staff, and policymakers with evidence-based strategies for designing more impactful ESD activities. This research offers an empirical evidence that connects established concepts in adult education to sustainability awareness within a globally recognized yet under-studied learning model of non-formal education in Japan.

The purpose of this research is to quantitatively examine the effect of participants' perceptions of feasibility and meaningfulness of ESD activities on their sustainability awareness within Japanese community centers. Based on the literature, the current research hypothesizes that:

- a. (H1) Higher perceived feasibility of ESD activities will be positively associated with greater sustainability awareness; and
- b. (H2) Higher perceived meaningfulness of ESD activities will be positively associated with greater sustainability awareness.

By testing these hypotheses, this research aims to provide a validated model for enhancing the role of community-based learning in promoting sustainability.

2. Method

This research employed a mixed-methods case study design to examine the relationships between the perceived feasibility and meaningfulness of ESD activities and participants' sustainability awareness at the Misonou Community Center in Japan. The case study approach was selected as it allows for in-depth investigation within the real-life context.

The research was conducted at the Misonou Community Center, a typical Japanese CLC that actively implements ESD programs. The center offers various ESD activities addressing environmental conservation, waste reduction, climate change mitigation, and sustainable consumption, making it an ideal setting for examining how participation in these activities influences sustainability awareness. The center serves a diverse urban community with varying socioeconomic backgrounds, providing a representative sample of providing community-based learning across different age groups and educational levels.

2.1. Participants and Sampling

The current research recruited 370 participants from the Misonou Community Center's ESD programs using a stratified random sampling approach to ensure representation across different activity types and demographic characteristics. The stratification was based on the three main ESD categories offered: environmental (15 activities, $n = 158$), social (10 activities, $n = 125$), and economic (7 activities, $n = 87$). This ensured that the sample accurately reflected the center's program distribution. The sample size was determined based on statistical power analysis recommendations for structural equation modeling (Kline, 2023).

Participants included 152 males (41.1%) and 218 females (58.9%), ranging in age from 18 to 85 years ($M = 54.6$, $SD = 15.3$). Educational backgrounds varied: 23.0% had completed high school education, 41.6% had vocational training or some college education, and 35.4% held university degrees. Approximately 62.4% of participants were employed either full-time or part-time, 28.1% were retired, and 9.5% were students.

For the qualitative component, a purposive subsample of 30 participants was selected to represent diverse perspectives based on their quantitative responses (15 with high feasibility/meaningfulness ratings, 10 with moderate ratings, and 5 with low ratings). This approach ensured capturing a wide range of experiences and perceptions regarding ESD activities.

2.2. Measures and Instruments

2.2.1. Sustainability Awareness Scale

Sustainability awareness was measured using a 45-item questionnaire adapted from the Sustainability Consciousness Questionnaire (SCQ) developed by Gericke et al. (2019). The scale measured three dimensions: sustainability knowledge (15 items, e.g., "I understand how my daily consumption habits affect environmental degradation"), sustainability attitudes (15 items, e.g., "I believe that individual actions can contribute to solving sustainability challenges"), and sustainable behaviors (15 items, e.g., "I regularly separate my household waste for recycling"). Participants responded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale demonstrated excellent reliability in previous studies (Cronbach's $\alpha = 0.89-0.93$).

2.2.2. Feasibility and Meaningfulness Scales

The perceived feasibility of ESD activities was measured using a 15-item scale adapted from Kwakman (2003), Proctor et al. (2011), and Lau and Tov (2023). This scale assessed practical accessibility dimensions including time requirements (e.g., "The timing of ESD activities fits well with my schedule"), financial considerations (e.g., "Participation costs are affordable for me"), required skills/knowledge (e.g., "I have the necessary background to participate actively"), and resource availability (e.g., "The necessary materials and resources are readily available for participation").

The perceived meaningfulness of ESD activities was measured using a 15-item scale adapted from Heddy et al. (2016) and Abdellatif (2021). This scale assessed personal relevance (e.g., "ESD activities address issues that are relevant to my daily life"), value alignment (e.g., "ESD activities align with my personal values and beliefs"), and significance perception (e.g., "Participation in ESD activities gives me a sense of contributing to something important").

Both feasibility and meaningfulness scales used a 4-point Likert-type response format ranging from 1 (not at all feasible/meaningful) to 4 (extremely feasible/meaningful). The instruments were translated into Japanese following back-translation procedures to ensure conceptual equivalence.

2.2.3. Demographic and Participation Variables

The survey also collected information on demographic characteristics (age, gender, education level, employment status) and participation variables (frequency of participation, duration of involvement in ESD activities, types of activities attended). These variables were included as potential covariates in the analysis to control for their possible effects on sustainability awareness.

2.3. Data Collection Procedures

Data collection was conducted between April and June 2024 through self-administered surveys and semi-structured interviews. The survey was distributed to 450 regular participants of the Misonou Community Center's ESD programs, resulting in 370 completed responses (82.2% response rate). Community center staff assisted participants who required special assistance or help completing the survey, particularly older adults with limited literacy or visual impairments.

The quantitative survey required approximately 20-25 minutes to complete and was administered in a quiet room at the community center before or after regular ESD activities. Participants provided written informed consent before completing the survey, and all procedures were approved by the institutional ethics committee.

For the qualitative component, 30 participants from the quantitative sample participated in semi-structured interviews lasting 45-60 minutes. Interviews were conducted in Japanese, as this was the preferred language of all participants. Interview questions explored perceptions of feasibility (e.g., "What makes ESD activities easy or difficult to participate in?"), meaningfulness (e.g., "What aspects of ESD activities feel most personally significant to you?"), and perceived changes in sustainability awareness (e.g., "What impact has participation had on your sustainability-related attitudes or actions?"). For analysis, the audio recordings of the interviews were verbatim transcribed and translated into English. Then, a thematic inductive analysis was used to code the qualitative data.

2.4. Data Analysis

Quantitative data were analyzed using IBM SPSS Statistics version 27 and AMOS version 24. Descriptive statistics were calculated for all variables, and reliability coefficients (Cronbach's alpha) were computed for all scales. Confirmatory factor analysis (CFA) was conducted to verify the factor structure of the feasibility, meaningfulness, and sustainability awareness scales. Structural equation modeling was used to test the hypothesized relationships between feasibility, meaningfulness, and sustainability awareness, controlling for demographic and participation variables.

Qualitative data were analyzed using thematic analysis following Braun & Clarke's (2006) six-step approach. Interview transcripts were coded inductively to identify patterns related to feasibility and meaningfulness dimensions. Codes were grouped into themes and subthemes through an iterative process, and representative quotations were selected to illustrate each theme. Mixed-methods integration involved comparing quantitative results with qualitative findings to develop a comprehensive understanding of the relationships between variables.

2.5. Ethical Considerations

All participants provided written informed consent after receiving detailed information about the research purposes and procedures. Participants were informed of their right to withdraw at any time without consequences. Confidentiality was maintained through anonymous data processing and secure storage of identifying information. Interview participants received a small honorarium as compensation for their time.

3. Results and Discussion

3.1. Results

The final sample consisted of 370 participants from the Misonou Community Center's ESD programs. Table 1 presents the demographic characteristics of the sample. Participants ranged in age from 18 to 85 years ($M = 54.6$, $SD = 15.3$), with slightly more females (58.9%) than males (41.1%). Educational backgrounds were diverse, with 35.4% holding university degrees, 41.6% having vocational training or some college education, and 23.0% completing high school education. Most participants (62.4%) were employed either on full-time or part-time jobs, while 28.1% were retired and 9.5% were students.

Table 1. Demographic Characteristics of Participants (N = 370)

Characteristic	Category	n	%
Gender	Male	152	41.1
	Female	218	58.9
Age	18-35 years	67	18.1
	36-55 years	142	38.4
	56-75 years	134	36.2
	76+ years	27	7.3
Education	High school	85	23.0
	Vocational/Some college	154	41.6
	University degree	131	35.4
Employment	Employed full-time	156	42.2
	Employed part-time	75	20.2
	Retired	104	28.1
	Student	35	9.5

Participants reported involvement in various types of ESD activities: environmental conservation (42.7%), waste reduction and recycling (28.1%), climate change education (15.4%), and sustainable consumption practices (13.8%). Frequency of participation varied, with 36.2% attending occasionally (1-2 times per month), 29.7% attending regularly (3-4 times per month), and 34.1% attending frequently (5+ times per month). Duration of involvement ranged from 3 months to 6 years ($M = 2.4$ years, $SD = 1.7$).

3.1.1. Reliability and Validity of Measures

All measurement scales demonstrated good to excellent reliability (Table 2). The Sustainability Awareness Scale showed high internal consistency ($\alpha = 0.94$), with subscale reliabilities of $\alpha = 0.89$ for knowledge, $\alpha = 0.91$ for attitudes, and $\alpha = 0.88$ for behaviors. The Feasibility Scale ($\alpha = 0.92$) and Meaningfulness Scale ($\alpha = 0.95$) also exhibited excellent reliability.

Table 2. Reliability Coefficients for Measurement Scales

Scale	Number of Items	Cronbach's α	95% CI
Sustainability Awareness Total	45	0.94	[0.93, 0.95]
• Knowledge	15	0.89	[0.87, 0.91]
• Attitudes	15	0.91	[0.89, 0.93]
• Behaviors	15	0.88	[0.86, 0.90]
Feasibility	15	0.92	[0.90, 0.93]
Meaningfulness	15	0.95	[0.94, 0.96]

Confirmatory factor analysis supported the hypothesized factor structure for all scales. For the Sustainability Awareness Scale, the three-factor model showed acceptable fit: $\chi^2(402) = 842.36$, $p < .001$, CFI = 0.92, TLI = 0.91, RMSEA = 0.06 (90% CI [0.05, 0.06]), SRMR = 0.05. All factor loadings were statistically significant ($p < .001$) and ranged from 0.52 to 0.86. The Feasibility and Meaningfulness scales also demonstrated good fit: $\chi^2(101) = 218.45$, $p < .001$, CFI = 0.95, TLI = 0.94, RMSEA = 0.06 (90% CI [0.05, 0.07]), SRMR = 0.04; and $\chi^2(101) = 202.73$, $p < .001$, CFI = 0.96, TLI = 0.95, RMSEA = 0.05 (90% CI [0.04, 0.06]), SRMR = 0.04, respectively.

3.1.2. Principal Component Analysis of Feasibility and Meaningfulness

Principal component analysis (PCA) with Promax rotation was conducted separately for the feasibility and meaningfulness items. For both constructs, the Kaiser-Meyer-Olkin measure verified sampling adequacy (KMO = 0.92 for feasibility, KMO = 0.94 for meaningfulness), and Bartlett's test of sphericity was significant ($\chi^2(105) = 3286.47$, $p < .001$ for feasibility; $\chi^2(105) = 3624.82$, $p < .001$ for meaningfulness).

The PCA revealed a unidimensional structure for both feasibility and meaningfulness, with single components explaining 62.3% and 65.8% of the variance, respectively. Table 3 shows the factor loadings for the five highest-loading items on each component. All items loaded strongly on their respective components (loadings > 0.60), confirming that feasibility and meaningfulness are distinct but related constructs.

Table 3. Highest Factor Loadings for Feasibility and Meaningfulness Components

Rank	Feasibility Items	Loading	Meaningfulness Items	Loading
1	Timing fits my schedule	0.86	Addresses issues relevant to my daily life	0.89
2	Location is convenient	0.83	Aligns with my personal values	0.87
3	Costs are affordable	0.81	Gives sense of contribution	0.85
4	I have required knowledge	0.78	Connects to broader concerns	0.84
5	Resources are available	0.76	Helps me make difference	0.82

3.1.3. Relationships Between Feasibility, Meaningfulness, and Sustainability Awareness

Structural equation modeling was used to test the hypothesized relationships between feasibility, meaningfulness, and sustainability awareness. The initial model showed an acceptable to good fit to the data: $\chi^2(602) = 1187.24$, $p < .001$, $\chi^2/df = 1.97$, CFI = 0.92, TLI = 0.91, RMSEA = 0.05 (90% CI [0.05, 0.06]), SRMR = 0.06. These indices meet the standard criteria for acceptable model fit (e.g., CFI/TLI > 0.90 , RMSEA < 0.08 , SRMR < 0.08 , and $\chi^2/df < 3$ (Kline, 2023)).

Figure 1. Structural equation model showing the standardized path coefficients (β) for the relationships between feasibility, meaningfulness, and sustainability awareness. It highlights that both feasibility ($\beta = 0.32$, $p < .001$) and meaningfulness ($\beta = 0.48$, $p < .001$) were significant positive predictors of sustainability awareness, supporting H1 and H2. The model explained 56% of the variance in sustainability awareness ($R^2 = 0.56$). Meaningfulness had a stronger effect on sustainability awareness than feasibility, as indicated by the larger standardized coefficient.

When examining the dimensions of sustainability awareness separately, meaningfulness was a stronger predictor of sustainability knowledge ($\beta = 0.41$, $p < .001$) and attitudes ($\beta = 0.52$, $p < .001$), while feasibility was a stronger predictor of sustainable behaviors ($\beta = 0.38$, $p < .001$). The interaction between feasibility and meaningfulness was not statistically significant ($\beta = 0.07$, $p = .12$), indicating that their effects on sustainability awareness were additive rather than multiplicative.

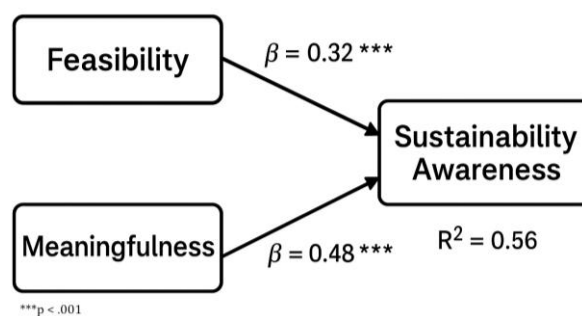


Figure 1. Structural Model of Relationships Between Variables

3.1.4. Qualitative Findings on Feasibility and Meaningfulness

Thematic analysis of interview data provided deeper insights into how feasibility and meaningfulness influence sustainability awareness. Regarding feasibility, participants emphasized practical considerations such as convenient scheduling ("The evening time slots allow me to attend after work"), accessible location ("I can walk to the center in less than 10 minutes"), and minimal costs ("Most activities are free or very affordable"). These practical elements lowered barriers to participation, enabling ongoing engagement with ESD content.

For meaningfulness, participants highlighted several aspects that enhanced personal relevance: connection to local context ("Learning about waste separation specifically for our community"), immediate applicability ("I started composting at home after the workshop"), and social connections ("Meeting others who

care about these issues gives me motivation"). These meaningful aspects fostered deeper cognitive and emotional engagement with sustainability topics.

Participants described how these elements worked together to enhance sustainability awareness: "When the activities are easy to attend [feasibility] and actually useful for my life [meaningfulness], I keep coming back and gradually start thinking differently about my impact on the environment" (Female, 52 years).

3.1.5. The Role of Demographic and Participation Variables

Additional analyses examined the influence of demographic and participation variables on sustainability awareness. Age was positively correlated with sustainability awareness ($r = 0.18$, $p = .001$), with older participants showing higher awareness scores. Education level also showed a positive relationship ($r = 0.22$, $p < .001$), with university-educated participants reporting higher awareness.

Frequency of participation was a significant predictor of sustainability awareness ($\beta = 0.25$, $p < .001$), even after controlling for feasibility and meaningfulness. Participants who attended ESD activities more frequently showed greater increases in sustainability awareness. Duration of involvement also showed a positive relationship with sustainability awareness ($r = 0.16$, $p = .003$), though this relationship was weaker than that for participation frequency.

No significant gender differences were found in sustainability awareness scores ($t(368) = 1.23$, $p = .22$), though qualitative data suggested some gender-based variation in which aspects of sustainability were prioritized (e.g., women emphasized waste reduction and consumption patterns more than men).

3.2. Discussion

The findings of this research confirm its hypotheses and provide a critical examination of how and why feasibility and meaningfulness significantly contribute to sustainability awareness within the unique non-formal learning settings of the Japanese community-based learning. Moving beyond mere confirmation of theoretical relationships, the mixed-methods data explain the mechanisms through which these factors cultivate sustainability awareness, revealing insights with significant theoretical and practical implications.

The structural equation model, accounting for 56% of the variance in sustainability awareness, emphasizes the considerable impact of feasibility and meaningfulness as predictive factors. This finding is consistent with established adult learning theories (Knowles et al., 2005; Courtney, 2019), while simultaneously providing a critical extension by quantitatively connecting these recognized motivational constructs to a specific educational outcome—sustainability awareness—within a non-Western, community-based context. This addresses a significant gap in the ESD literature, which has often focused on policy or descriptive case studies rather than empirical examination of psychosocial determinants (Nomura & Abe, 2009).

The stronger predictive power of meaningfulness ($\beta = 0.48$) compared to feasibility ($\beta = 0.32$) represents a significant finding. It indicates that while reducing practical obstacles is essential for encouraging participation, it is insufficient for optimizing learning outcomes; the personal significance and relevance of ESD activities have a far greater impact on developing sustainability awareness. The substantial influence of meaningfulness offers strong support for Mezirow's (2012) transformative learning theory. Qualitative data clarify this mechanism: activities that held personal resonance (for instance, those addressing local waste management concerns) and offered immediate practical application (such as home composting techniques) initiated the disorienting dilemmas and critical reflection characteristic of transformative learning. This outcome challenges program administrators to go beyond logistical considerations and focus on developing content that shows profound relevance to participants' daily experiences and belief systems.

The demonstrated unidimensional structure of feasibility and meaningfulness suggests that participants perceive these constructs as coherent concepts rather than collections of disparate factors. The high factor loadings for items related to scheduling convenience, cost affordability, value alignment, and personal relevance indicate that these are core elements that community center administrators should prioritize when designing ESD programs.

The differential impact of feasibility and meaningfulness on various dimensions of sustainability awareness requires critical examination. While meaningfulness was a stronger predictor of knowledge and attitudes, feasibility showed a stronger relationship with sustainable behaviors. This implies that nurturing the cognitive and affective aspects of sustainability necessitates profound involvement; however, the translation of intention into consistent action may be impeded by enduring practical constraints (such as financial cost, time commitments, or availability of recycling infrastructure). Therefore, this pattern suggests that reducing practical barriers may be particularly important for translating awareness into action, while creating personally

meaningful learning experiences is crucial for developing foundational knowledge and positive attitudes toward sustainability.

The qualitative data provided insights for interpreting the quantitative results, moving beyond correlation to illuminate the mechanisms through which feasibility and meaningfulness operate in practice. Participants' emphasis on practical considerations such as evening time slots, walking distance, and minimal costs underscores that feasibility functions as a critical gatekeeper to initial and consistent engagement. These findings not only confirm previous research on barriers to adult education participation (Boeren et al., 2010; Hovdhaugen & Opheim, 2018) but critically extends them by demonstrating that in the context of ESD, removing these barriers is not merely about boosting attendance figures; it is a prerequisite for creating the sustained exposure necessary for transformative learning to occur. Furthermore, the qualitative emphasis on local relevance reveals the core mechanism of meaningfulness. It was not abstract environmental concepts but their direct connection to participants' daily lives that promoted deep, personal engagement. This finding critically advances the understanding of ESD in adult learning contexts. It suggests that the effectiveness of CLCs programs depends on their ability to localize sustainability issues, making them actionable. This understanding positions CLCs not just as facilities that provide opportunities for learning, but as vital institutions that translate broad sustainability goals into the specific socio-cultural context of the community they serve.

The positive correlation between frequency of participation and sustainability awareness, even after controlling for feasibility and meaningfulness, adds significance to the findings. This suggests a self-reinforcing learning cycle: feasible and meaningful activities attract repeat participation, which in turn deepens awareness through reinforcement and social learning. This finding challenges the efficacy of one-off awareness campaigns and provides strong empirical support for the literature advocating sustained, iterative non-formal education programs (Rogers, 2019), supporting the literature on non-formal education for sustainable development (Fuwa, 2001; Ogawa, 2005; Summers & Cutting, 2016; Abdellatif, 2020). The weaker relationship between duration of involvement and sustainability awareness further sharpens this insight, indicating that regularity of engagement is a more powerful driver of awareness than mere long-term participation. This is a crucial distinction for program design, emphasizing the need for a consistent calendar of activities rather than relying on long-term but sporadic member participation.

The absence of significant gender differences in overall sustainability awareness scores presents a contradiction to some previous research (Levy et al., 2016). This divergence may itself be a finding of significance, potentially reflecting the participatory and inclusive nature of the community center's ESD programs, which might successfully mitigate the gender gaps observed in other settings. However, the qualitative findings suggesting gender-based variation in sustainability priorities indicate that while overall awareness levels may be similar, men and women might focus on different aspects of sustainability in their daily practices based on socially constructed roles and responsibilities. Future research should therefore move beyond measuring aggregate awareness to explore how it is enacted differently across demographic groups.

Finally, this research extends the scholarship on Japanese social education (Arai & Tokiwa-Fuse, 2013; Kawano et al., 2016; Sato, 2016) by providing empirical evidence of how specific program characteristics influence sustainability outcomes. It demonstrates that the community center's effectiveness as a platform for promoting sustainability awareness is directly influenced by two fundamental factors: practical accessibility and personal relevance. This provides a framework for optimizing CLCs globally, arguing that their success depends on strategically addressing both the logistical and epistemological barriers to adult participation in lifelong learning for sustainable development.

4. Conclusion

This research establishes that both the practical accessibility and personal relevance of ESD activities are significant drivers of sustainability awareness within Japanese community learning centers. The finding that meaningfulness shows a stronger influence than feasibility provides a critical strategic insight: while minimizing logistical barriers is necessary to encourage participation, the ultimate depth of learning and awareness is predominantly determined by how personally relevant and applicable the content is to participants' daily lives and values. This underscores the importance of moving beyond a solely logistical view of program design toward one that prioritizes transformative, value-based learning experiences.

Consequently, effective ESD programming requires a dual-focused approach. Practitioners should prioritize co-designing curricula with community members to ensure local relevance and representation of local voices, while simultaneously securing resources to reduce practical barriers such as cost and scheduling conflicts. Furthermore, policymakers and institutional leaders should support not only the implementation of programs but also investments in facilitator training and mechanisms for long-term participant engagement. By adopting this integrated strategy, community centers can fully realize their potential as vital platforms for developing sustainability awareness and informed civic action needed to address our pressing global challenges.

Author Contributions

The sole author was responsible for all aspects of this research.

Funding

No funding support was received.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

- Abdellatif, K. M. (2020). Non-formal adult education for sustainability: A preliminary survey of the research literature. *Bulletin of the Graduate School of Humanities and Social Sciences, Hiroshima University. Studies in Education*, 1(1), 627-636. <https://doi.org/10.15027/50246> Hiroshima University Repository
- Abdellatif, K. M. (2021, March). Factors affecting the participation of learners in social education: A study of community-based learning activities at Kominkan. *教育学研究ジャーナル = The Journal of Educational Research*, 26(1), 21-32. https://doi.org/10.20677/csssej.26.0_21-J-STAGE+2CiNii+2
- Abe, O. (2014). ESD projects in Japanese schools and in non-formal education in Japan. In J. Lee & R. Efi (Eds.), *Schooling for sustainable development across the Pacific* (pp. 125-139). Springer.
- Arai, Y., & Tokiwa-Fuse, M. (2013). Social education and Kominkan. *Human Right Education in Asia-Pacific*, 4(1), 169-194. <https://www.hurights.or.jp/archives/asia-pacific/section1/pdf/Regional%20Programming%20on%20Human%20Rights%20Education.pdf>
- Boeren, E., Nicaise, I., & Baert, H. (2010). Theoretical models of participation in adult education: The need for an integrated model. *International Journal of Lifelong Education*, 29(1), 45-61. <https://doi.org/10.1080/02601370903471270>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp0630a>
- Brundtland, G. (1987). *Report of the World Commission on Environment and Development: Our common future* (UN General Assembly document A/42/427). United Nations. Retrieved March 21, 2025, from <http://www.un-documents.net/ocf-02.htm>
- Courtney, S. (2019). *Why adults learn: Towards a theory of participation in adult education*. Routledge.
- Fuwa, K. (2001). Lifelong education in Japan, a highly school-entered society: Educational opportunities and practical educational activities for adults. *International Journal of Lifelong Education*, 20(1), 127-136. <https://doi.org/10.1080/02601370010008327>
- Gericke, N., Boeve-de Pauw, J., Berglund, T., & Olsson, D. (2019). The Sustainability Consciousness Questionnaire: The theoretical development and empirical validation of an evaluation instrument for stakeholders working with sustainable development. *Sustainable Development*, 27(1), 35-49. <https://doi.org/10.1002/sd.1859>
- Heddy, B. C., Sinatra, G. M., Seli, H., Taasobshirazi, G., & Mukhopadhyay, A. (2016). Making learning meaningful: Facilitating interest development and transfer in at-risk college students. *Educational Psychology*, 37(5), 565-581. <https://doi.org/10.1080/01443410.2016.1150420>
- Hovdhaugen, E., & Opheim, V. (2018). Participation in adult education and training in countries with high and low participation rates: Demand and barriers. *International Journal of Lifelong Education*, 37(5), 560-577. <https://doi.org/10.1080/02601370.2018.1554717>
- Kawano, A., Matsuda, T., & Xiao, L. (2016). Social education in Japan. *Pedagogía Social*, 27(1), 253-280. https://doi.org/10.7179/PSRI_2016.27.12
- Kline, R. B. (2023). *Principles and practice of structural equation modelling* (5th ed.). Guilford Press.
- Knowles, M. S., Holton III, E. F., & Swanson, R. A. (2005). *The adult learner* (6th ed.). Elsevier.
- Kwakman, K. (2003). Factors affecting teachers' participation in professional learning activities. *Teaching and Teacher Education*, 19(1), 149-170. [https://doi.org/10.1016/S0742-051X\(02\)00101-4](https://doi.org/10.1016/S0742-051X(02)00101-4)
- Lau, C. Y. H., & Tov, W. (2023). Effects of positive reappraisal and self-distancing on the meaningfulness of everyday negative events. *Frontiers in Psychology*, 14, Article 1093412. <https://doi.org/10.3389/fpsyg.2023.1093412>
- Levy, A., Orion, N., & Leshem, Y. (2016). Variables that influence the environmental behaviour of adults. *Environmental Education Research*, 24(3), 307-325. <https://doi.org/10.1080/13504622.2016.1271865>
- Maruyama, H. (2010). *Education for Sustainable Development (ESD) in Japan*. NIER. Retrieved March 21, 2025, from <https://www.nier.go.jp/English/educationjapan/pdf/201103ESD.pdf>
- Mezirow, J. (2012). Learning to think like an adult: Core concepts of transformation theory. In E. W. Taylor & P. Cranton (Eds.), *The handbook of transformative learning: Theory, research, and practice* (pp. 73-95). Jossey-Bass.

- Ministry of Foreign Affairs of Japan [MoFA]. (2018). *Japan's efforts for promoting the SDGs*. Retrieved April 15, 2025, from https://www.mofa.go.jp/policy/oda/sdgs/pdf/about_sdgs.pdf
- Noguchi, F., Guevara, J. R., & Yoroizu, R. (2015). *Communities in action: Lifelong learning for sustainable development*. UIL.
- Nomura, K., & Abe, O. (2009). The education for sustainable development movement in Japan: A political perspective. *Environmental Education Research*, 15(4), 483-496. <https://doi.org/10.1080/13504620903056355>
- Ogawa, S. (2005). Lifelong learning and demographics: A Japanese perspective. *International Journal of Lifelong Education*, 24(4), 351-368. <https://doi.org/10.1080/02601370500169269>
- Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health and Mental Health Services Research*, 38(2), 65-76. <https://doi.org/10.1007/s10488-010-0319-7>
- Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: In search of conceptual origins. *Sustainability Science*, 14(1), 681-695. <https://doi.org/10.1007/s11625-018-0627-5>
- Rogers, A. (2019). Second-generation non-formal education and SDGs: Operationalizing the SDGs through community learning centers. *International Journal of Lifelong Education*, 38(5), 515-526. <https://doi.org/10.1080/02601370.2019.1636897>
- Sato, C. (2016). Kominkan: Its roles in education and community-building. In K. Okano (Ed.), *Nonformal education and civil society in Japan* (pp. 159-178). Routledge.
- Summers, D., & Cutting, R. (2016). *Education for sustainable development in further education*. Palgrave Macmillan.
- Tanaka, H. (2017). Current state and future prospects of Education for Sustainable Development (ESD) in Japan. *Educational Studies in Japan. International Yearbook*, 11(1), 15-28. <https://doi.org/10.7571/esjkyoiku.11.15>
- UNESCO. (2014). *Roadmap for implementing the Global Action Programme (GAP) on Education for Sustainable Development*. Retrieved March 1, 2025, from <http://unesdoc.unesco.org/images/0023/002305/230514e.pdf>