

ORIGINAL ARTICLE

Understanding Social Sustainability in Universities: A Structural Equation Modelling Analysis of Students' Perspectives

Raymond Mutasingwa Bitegeko (PhD.)^{1*}

Abstract

This study examines the structural relationships among three key pillars of social sustainability (SoSu)—equity and inclusion (EI), student well-being (SW), and community engagement (CE)—and the extent to which they explain SoSu from the perspective of Tanzanian university students. Guided by the Whole Institution Approach and Ecological Systems Theory, data were collected from 470 students via a closed-ended questionnaire and analysed using descriptive statistics and structural equation modelling. Results showed moderate to high agreement across the pillars (mean scores > 3.5), with lower ratings for anti-discrimination (EI-6, $M = 3.34$), student voice (SW-6, $M = 3.61$), and volunteering (CE-3, $M = 3.96$). Significant positive correlations were found among the pillars (EI–SW: $r = .47$; SW–CE: $r = .45$; EI–CE: $r = .33$, $p < .01$). Student well-being emerged as the strongest predictor of social sustainability outcomes (SSO; $\beta = .706$, $p < .001$), followed by community engagement ($\beta = .353$) and equity and inclusion ($\beta = .208$). The three pillars jointly explained 67 % of the variance in SSO ($R^2 = .666$). The findings underscore the central role of student well-being in socially sustainable universities and the need for student-centred policies, stronger institutional support, and enhanced university–community linkages. Although the cross-sectional design limits causal inference, the study offers useful insights for integrating social sustainability indicators into higher education policy and practice in Tanzania, in line with the Sustainable Development Goals.

Keywords: social sustainability; equity and inclusion; student well-being; community engagement, SDGs, Tanzanian Universities

Introduction

Despite the growing prominence of sustainability policies and frameworks in the global development agenda, challenges related to social sustainability (SoSu) remain widespread. UNESCO (2025) reports that approximately 251 million children and young people are excluded from education each year, while mental health conditions affect over one billion people globally and are linked to anxiety, suicide, and reduced civic engagement (World Health Organization, 2022, 2025). Suicide alone claims around 720,000 lives annually

1 Department of Educational Foundation and Continuing Education,
College of Education, University of Dodoma, Dodoma, Tanzania.
Mobile: +255 713 402922
<https://orcid.org/0000-0002-3195-5059>

*Corresponding Author email: groupsae215@gmail.com; raymond.bitegeko@udom.ac.tz



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and ranks among the leading causes of death for young people aged 15–29.

In Tanzania, university students report high levels of mental distress, with serious self-harm thoughts estimated at 21.9% (Lugata et al., 2021; Rweyemamu et al., 2024). These conditions reflect persistent SoSu challenges rooted in social inequality, exclusion, and deprivation, and are exacerbated by economic hardship and limited emotional support that hinder individual and collective flourishing (Bubinza et al., 2025).

SoSu extends sustainability discourse beyond economic and environmental dimensions by prioritising human dignity and collective well-being (Nilsson et al., 2024; Wolff & Ehrström, 2020). It largely encompasses values such as social cohesion, equity, fairness, dignity, reduced inequality, and intergenerational justice (Nilsson et al., 2024), aligning closely with the “leaving no one behind” (LNOB) principle of the 2030 Agenda for Sustainable Development (United Nations, 2015), which emphasises equitable resource distribution. These principles underpin several Sustainable Development Goals (SDGs), including SDG 4 (Quality Education), SDG 5 (Gender Equality), and SDG 10 (Reduced Inequalities). They are expected to inform national and local development policies. Moreover, they provide a strategic framework for aligning policy implementation with inclusive and equitable development outcomes, thereby strengthening accountability and promoting sustainable socio-economic transformation.

Within universities, SoSu encompasses equitable access, inclusive learning, student welfare and community engagement (Chakra, 2025; Wolff & Ehrström, 2020). These dimensions promote fairness and social partnership (Leal Filho et al., 2019), so practices that support well-being and university–community linkages are essential. Empirical evidence shows that universities increasingly align with sustainability frameworks and advance the United Nations 2030 Agenda (Chankseliani & McCowan, 2021). Through their core functions, they support the 17 SDGs (Chakra, 2025; UNESCO, 2017) and act as public goods (Žalėnienė & Pereira, 2021).

However, institutions in the Global South face policy inconsistency, limited resources, cultural resistance, rising enrolment and pressure to meet international academic standards (Leal Filho et al., 2022; Mgaiwa & Ishengoma, 2023), thereby sidelining students’ social welfare. Consequently, the social pillar remains marginalised (Tafese & Kopp, 2025), thereby weakening holistic sustainability. Most scholarship examines students’ perceptions of the SDGs (Maoela et al., 2024; Pedro et al., 2025), yet knowledge gaps persist, particularly regarding SDGs related to social sustainability.

Scholars recognise equity and inclusion, student well-being, and community engagement as key pillars of SoSu in higher education (Koekkoek et al., 2021; Spănu et al., 2024; Leal Filho et al., 2022; Douwes et al., 2023). Studies, however, often examine these pillars separately, limiting understanding of their interrelationships and the institutional

supports that underpin them. Integrated analytical approaches therefore remain limited. The purpose of this study is to examine the relationships among the pillars of SoSu and to determine the extent to which these pillars explain social sustainability in Tanzanian universities. Drawing on students' perspectives, the study employs structural equation modelling (SEM) to test the hypothesised relationships among the SoSu pillars and to assess their direct and collective contributions to social sustainability outcomes. By providing empirical evidence from Tanzanian universities, the study seeks to advance understanding of the key dimensions that promote socially sustainable universities and to inform institutional policy and practice. Specifically, this study is guided by the following objectives and the corresponding hypotheses.

1. To determine the perceived relationship among key pillars of SoSu, namely inclusion and equity, student well-being, and community engagement

Corresponding hypotheses

H1a: Inclusion and equity are significantly associated with student well-being.

H1b: Student well-being is significantly associated with community engagement.

H1c: Inclusion and equity are significantly associated with community engagement.

2. To examine the explanatory power of key pillars of SoSu, which are inclusion and equity, student well-being, and community engagement, on social sustainability outcomes

Corresponding hypotheses

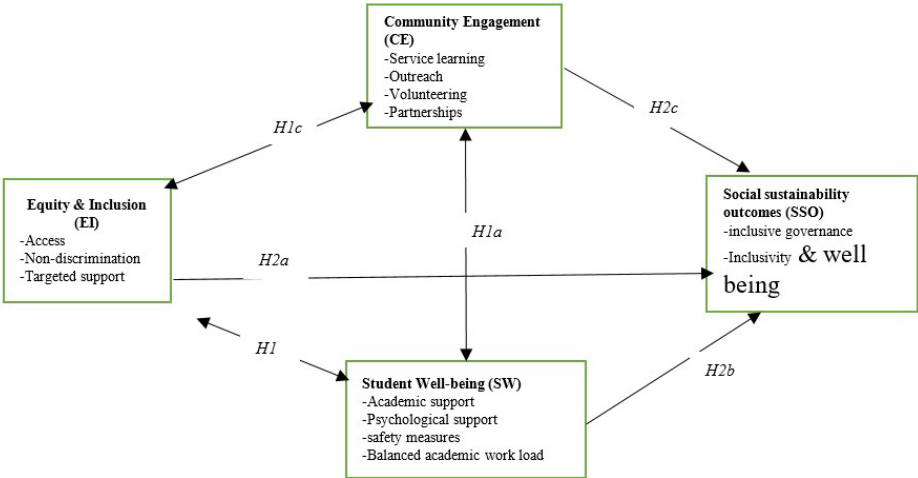
H2a: Inclusion and equity are significant positive indicators of social sustainability outcomes.

H2b: Student well-being is a significant positive indicator of social sustainability outcomes.

H2c: Community engagement is a significant positive indicator of social sustainability outcomes.

The above hypotheses are operationalised in the conceptual model (Figure 1)

Figure 1
Hypothesised Conceptual Model



Source: Author’s own construction for the present study (2025)

Note: The single-headed arrows for H2a, H2b, and H2c represent hypothesised structural pathways derived from the theoretical framework. Given the cross-sectional nature of the data, these pathways indicate directional statistical associations rather than causal or temporal relationships.

Theoretical Foundations

This study is grounded in the Whole Institution Approach (WIA) and the Ecological Systems Approach (ESA).

Whole Institution Approach (WIA)

The Whole Institution Approach (WIA), promoted by UNESCO (2021, 2024), advocates a holistic model in which sustainability principles are embedded across all institutional functions, including teaching, governance, operations, and community partnerships (Jiménez-Elizondo, 2023; Leal Filho et al., 2022). This integration promotes inclusive participation by supporting policies that enhance equitable access and engagement, in line with, SDG 4 and SGD 5 and SDG 10.

In addition, WIA emphasises student well-being by fostering institutional cultures that support physical, mental, and emotional development, consistent with SDG 3. Furthermore, the approach highlights community outreach as a key platform for students’

active engagement with societal challenges at local and global levels. Overall, WIA provides a comprehensive framework for embedding social sustainability within institutional structures and practices.

Ecological Systems Approach (ESA)

The ESA, developed by Urie Bronfenbrenner (1979), offers valuable insights into how multiple environmental systems influence individual development. Rooted in educational psychology and sustainability theory, the approach emphasises that social challenges, such as exclusion and marginalisation, are shaped by interconnected social, cultural, and policy contexts (UNESCO, 2021).

From this perspective, students' mental, emotional, and physical well-being is shaped by interdependent factors, including peer relationships, institutional health and counselling services, and national policy frameworks. The model also underscores the importance of mentorship, opportunities for participation, and supportive learning environments in nurturing students' engagement in community outreach and service-learning. Moreover, it stresses the role of instructional practices in promoting active citizenship and sustainability values.

Integrated WIA and ESA

WIA and ESA provide complementary perspectives on social sustainability practices, particularly in higher education. WIA emphasises the role of universities as organisational systems that embed sustainability principles across institutional policies, teaching practices, governance, campus operations, and external partnerships. However, WIA alone offers limited explanation of how students experience and internalise these institutional practices. ESA addresses this limitation by explaining how students' development and engagement emerge from dynamic interactions between individual characteristics and multiple environmental systems, including institutional, social, and policy contexts.

Therefore, within this study's SEM framework, WIA represents the institutional antecedents that create enabling environments for social sustainability, while ESA explains the mechanisms by which these environments influence student-level outcomes. Integrating both perspectives enables the model to capture the multilevel nature of social sustainability by linking institutional practices to students' inclusion, well-being, and engagement. Consequently, the combined WIA-ESA framework provides a comprehensive theoretical foundation for examining how higher education institutions can promote socially sustainable outcomes.

Empirical Literature Review

Social Sustainability in Academic Discourse

Envisioning SoSu in education requires institutional and pedagogical systems that address discrimination, exclusion, and inequality (Sterling, 2011; UNESCO, 2017). Institutional values should be grounded in equity, inclusion, diversity, well-being, participation, and learner empowerment for meaningful community contribution (Nilsson et al., 2024; Tafese & Kopp, 2025). Essentially, its integration nurtures socially responsible individuals capable of navigating complex contexts. Despite its importance, SoSu is inconsistently defined and insufficiently embedded in broader sustainability discourse (Leal Filho et al., 2019).

SoSu is often described as multi-dimensional, dynamic, and context-dependent. It focuses on human-centred developmental aspects, including safety and security, equity, adaptability, social inclusion and cohesion, and human well-being/quality of life (Dempsey et al., 2011; Ly & Cope, 2023; Murphy, 2012). For example, safety and security emphasise protection from social and economic risks, the promotion of stable living conditions, and resilience against social violence (Ly & Cope, 2023). The World Bank (2023) maintains that promoting safety is a fundamental strategy for building social resilience and cohesion. The equity dimension focuses on the fair distribution of resources and opportunities. In practice, equity involves deliberate measures to reduce social inequalities, which are the root cause of socially unsustainable behaviour (Rogers et al., 2012). In particular, promoting equitable access to opportunities, including education and training, is regarded as a prerequisite and reliable determinant of social equity (Dempsey et al., 2011; Swanzy et al., 2019). Furthermore, adaptability is recognised as a key domain of social sustainability (SoSu), emphasising the ability of social systems and individuals to adapt to change while maintaining society's core values. This domain underscores the importance of flexibility, lifelong learning, and innovation to accommodate accelerating digital advancement and its associated social changes. From an urban planning perspective, Dempsey et al. (2011) linked adaptability to how communities respond to change while preserving social equity and maintaining human well-being.

Furthermore, the concept of SoSu can be examined at two distinct levels initiatives: the macro/meso level, which focuses on structural and community aspects, and the micro level, which focuses on advancing human capability and well-being. At the macro level, SoSu is perceived through a structural and community lens, emphasising collective processes of social development. In particular, strategies at this level highlight social equity, community resilience and engagement, participation, social inclusion, governance, and institutional processes (Dempsey et al., 2011; Murphy, 2012). At the macro level,

SoSu is viewed as an integrated whole of social policies, norms, relations, and processes—rather than as a set of personalised processes.

In contrast, at the micro level, SoSu primarily focuses on the individual. At this level, SoSu is viewed through the lenses of human capability and well-being perspectives. The emphasis is on the conditions that enable individuals to thrive within society, including health, subjective well-being, and meaning-making. Missimer et al. (2017) emphasise that at this level, SoSu should promote human physical and mental well-being through investments in strategies such as equitable access to health care, competence and capacity building, and the promotion of equity and inclusion. The human capability and well-being approach to SoSu draws heavily from the capability approach, questioning what individuals are able to do and be, and underscoring the central roles of the affective and psychomotor aspects of human development. Presenting SoSu from both structural/community and human capability/well-being orientations highlights a common tension in the literature: balancing collective/systemic needs with individual agency.

These multifaceted conceptualisations highlight the complexity of social life. Nonetheless, there is consensus that SoSu complements the economic and ecological dimensions by embedding human-centred aspects of sustainability and well-being. Given the dynamic nature of social systems, SoSu pillars are best viewed as ongoing processes rather than fixed outcomes (Ly & Cope, 2023). In this study, SoSu denotes a university's capacity to foster institutional social impact through enhanced fairness and accessibility, physical, emotional, and academic well-being, and community engagement—examined across three integrated dimensions: equity and inclusion, student well-being, and community engagement.

In education, equity and inclusion constitute an ongoing process of identifying and eliminating barriers to access, participation, and achievement (Ainscow, 2020), thereby ensuring fairness. Essentially, it involves support for all students, especially vulnerable groups such as girls and people with disabilities (Nawire et al., 2025). Notably, key strategies include, inclusive admissions and flexible curricula (Ajjawi et al., 2023), equity-focused policies such as financial aid and mentorship (Ainscow, 2020; Mgaiwa & Ishengoma, 2023), support services and inclusive assessment methods (Ajjawi et al., 2023; Dollinger et al., 2023) along with safety and affordable accommodation (Chaudhry et al., 2024; Li, 2025).

Studies from around the world highlight a range of barriers to equity and inclusion, including funding shortages despite existing supportive policies (Dollinger et al., 2023), weak political commitment, and poor policy implementation and enforcement (Ainscow, 2020; Mgaiwa & Ishengoma, 2023). Additional challenges include fragmented support services and neoliberal priorities that emphasise institutional rankings over student well-being (Ajjawi et al., 2023). Although these challenges affect both the Global North and the

Global South, funding constraints are particularly acute in African contexts.

In Tanzania, the Higher Education Students' Loans Board (HESLB) promotes equity through student financial support (HESLB, 2023; Mgaiwa & Ishengoma, 2023); however, the effectiveness of this support is constrained by funding shortfalls and inconsistencies in implementation. Similarly, Swanzy et al. (2019) reported improvements in access to higher education in Ghana but found persistent dissatisfaction with implementation gaps, suggesting that financial support mechanisms are essential but insufficient without effective implementation.

From a psychological viewpoint, well-being is a multidimensional construct that optimises human functioning and lived experiences (Li, 2025). In the higher education context, student well-being includes psychological aspects such as mental health, self-esteem, motivation, and self-realisation (Chaudhry et al., 2024; Li, 2025; Kruger et al., 2025). Besides, the emotional, social, physical, and academic dimensions reflect satisfaction, support, resources, and learning experiences. Collectively, these interrelated aspects emphasise well-being as central to students' engagement, achievement, and holistic development and that integrated support systems are essential for promoting and sustaining student well-being (Li, 2025).

Community engagement—including service learning, volunteering, community-oriented research, and outreach programmes—is widely recognised as the university's third mission, complementing its traditional roles in teaching and research (Koekkoek et al., 2021; Spânu et al., 2024). From a social perspective, it serves as an effective mechanism for establishing formal collaborations with local communities and facilitating knowledge sharing through training, workshops, and public education (Machimana et al., 2020). Generally, the philosophy and practice of community engagement in educational contexts are directed towards achieving academic, civic, and social outcomes.

Clifford et al. (2020) explored undergraduate students' understanding of different forms of community engagement, particularly service learning and social entrepreneurship education, revealing that students' social and personal backgrounds influenced their understanding and participation. Furthermore, studies indicate that university students hold positive perceptions of service learning as a means of developing skills and enhancing global citizenship competencies (Machimana et al., 2020). Community engagement contributes to social sustainability by promoting empowerment, capacity building, knowledge sharing, social cohesion, and collective action (Machimana et al., 2020). Nevertheless, achieving long-term social sustainability requires universities to adopt inclusive, context-specific approaches to community engagement.

Methodology

Research Design

This study employed a cross-sectional design within a quantitative research approach. Cross-sectional designs are considered efficient and practical for university-based research (Setia, 2016). They enable the statistical examination of associations among exogenous variables and their structural relationship with endogenous variables (Krause, 2018). Specifically, this study examined the relationships among three key pillars of social sustainability (SoSu), namely: equity and inclusion (EI), student well-being (SW), and community engagement (CE), and to assess their direct and collective contributions to social sustainability outcomes

Setting, Population, and Sample of the Study

The study was conducted at one of the largest public universities in Tanzania, where the target population comprised undergraduate and postgraduate students. A priori sample size was calculated using G*Power version 3.1.9.7 (Faul et al., 2009). The analysis was based on the following assumptions: a medium effect size ($\rho = .30$ for correlations; $f^2 = 0.15$ for regression), a significant level of $\alpha = .05$, and statistical power of 0.80, yielding a minimum required sample size (N) of 85 participants. This calculation was intended to determine the minimum sample required to detect the hypothesised effects rather than to establish sample adequacy for Structural Equation Modelling (SEM), which typically requires substantially larger samples. For SEM, a sample size of at least 200 is generally recommended to obtain stable parameter estimates, reliable standard errors, and robust model fit indices (Hair et al., 2022). Accordingly, the final sample of 470 participants, obtained through convenience sampling, substantially exceeded both the minimum requirement indicated by the a priori power analysis and the conventional recommendations for SEM, thereby enhancing the statistical power, precision, and stability of the estimated model parameters.

Although this study employed convenience sampling within a cross-sectional design, which may increase the risk of common method bias, no statistical assessment (e.g., Harman's single-factor test or the marker variable technique) was conducted. Instead, consistent with the recommendations of Podsakoff et al. (2003), procedural remedies, including ensuring respondent anonymity, separating questionnaire items, and incorporating reverse-coded items were implemented to minimize the potential for common method bias. Of the 470 participants, 241 (51.28%) were male and 229 (48.72%) were female. The majority were aged 20–24 years (70%), followed by those aged 36 years and above (10.85%), 25–30 (10%), 31–35 years (8.3%), and under 20 years (.85%).

Data Collection Instrument

Data were collected using a self-developed, closed-ended questionnaire, which initially comprised 50 Likert-scale items. For the purpose of this study, only 32 items relating to demographic characteristics and social sustainability were analysed. SoSu was measured using four constructs: equity and inclusion (8 items), student well-being (8 items), community engagement (7 items), and overall social sustainability (5 items). The questionnaire items were developed through an extensive review of the relevant literature and refined through expert evaluation. The measurement constructs and their corresponding sources are presented in Table 1.

Table 1

Questionnaire Items and Intended Measures

Construct	Items and Intended Measure	Key Literature Sources
Equity and Inclusion (EI)	EI-1: Equal access to learning	Ajjawi et al. (2023); Mgaiwa & Ishengoma (2023); UNESCO (2017, 2021)
	EI-2: Respect for diversity	
	EI-3: Sense of belonging	
	EI-4: Support for disadvantaged students	
	EI-5: Accessibility of facilities	
	EI-6: Anti-discrimination enforcement	
	EI-7: Diversity policies	
	EI-8: Fair treatment by staff	
Student Well-being (SW)	SW-1: Access to health services	Chaudhry et al. (2024); Li (2025); Kruger et al. (2025)
	SW-2: Academic workload balance	
	SW-3: Emotional support	
	SW-4: Crisis support awareness	
	SW-5: Healthy lifestyle promotion	
	SW-6: Student voice on well-being	
	SW-7: Privacy and mental health policies	
	SW-8: Campus safety	
Community Engagement (CE)	CE-1: Service-learning participation	Clifford et al. (2020); Koekkoek et al. (2021); Spănu et al. (2024)
	CE-2: Sustainability awareness	
	CE-3: Volunteering involvement	
	CE-4: Learning about social issues	
	CE-5: Knowledge application	
	CE-6: University–community partnership	
	CE-7: Institutional inclusiveness	

Social Sustainability	SSO-1: Supportive environment	Spănu et al. (2024); Koekkoek et al.
Outcomes (SSO).	SSO-2: Responsible education	(2021); Tafese & Kopp (2025); Wolff &
	SSO-3: Good governance	Ehrström (2020); UNESCO (2021)
	SSO-4: Partnerships	
	SSO-5: Institutional inclusiveness	

Source: Authors' own construction (2025)

EI=Equity and Inclusion; SW=Student Welfare; CE=Community Engagement; SSO=Social Sustainability Outcomes

Data Collection Procedures

Before data collection, the researcher met with selected cohorts of potential participants to explain the purpose of the study, introduce the research instrument, and obtain informed consent. These meetings enhanced participants' understanding of the study, established rapport, and contributed to a higher response rate. The questionnaire was then distributed electronically via Google Forms through degree programme and class-based WhatsApp groups. With the exception of demographic items, all questionnaire statements were measured using a five-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree) to capture participants' perceptions. The survey remained open for 21 consecutive days during Weeks 4-7 of the second semester of the 2024/2025 academic year.

As the survey was administered electronically through shared Google Forms links, it was not possible to determine the exact response rate because the total number of individuals who received or reviewed the survey link (i.e. the denominator) could not be accurately established (Fricker, 2008). Consequently, only the number of completed responses was known. To ensure data quality and participant eligibility, screening questions were included at the beginning of the questionnaire. These required respondents to confirm that they were currently enrolled as undergraduate or postgraduate students at the target university before proceeding to the main survey.

Ethical Considerations

Ethical approval for the study was granted by the Institutional Research Review Ethics Committee (IRREC) with reference number MA.84/261/90/128. Before participating, all respondents were informed about the purpose of the study and advised that their participation was entirely voluntary. They were also informed that they could withdraw from the study at any stage without penalty or adverse consequences. Informed consent was obtained electronically, with participants indicating their agreement by selecting the 'I agree' option before accessing the questionnaire. To protect participants' privacy, all data were treated confidentially and handled in accordance with established ethical research principles throughout the study.

Data Analysis

Data were analysed using SPSS Version 25 and AMOS Version 25. Descriptive statistics were first used to summarise students' perceptions and assess the reliability of the measurement scales. Subsequently, multivariate analyses were conducted, including Confirmatory Factor Analysis (CFA) to validate the latent constructs and Structural Equation Modelling (SEM) to examine the hypothesised structural relationships among the study variables. Structural path analysis was then performed to test the proposed hypotheses by estimating the direct statistical contribution of EI, SW, and SW on SSO.

Results

Descriptive Statistics and Measurement Model Assessment

Table 2 presents the results of the descriptive statistics, reliability analysis, and convergent validity assessment for the study's latent constructs, providing evidence of the consistency and adequacy of the measurement scales used in the analysis. Overall, the findings indicate that the measurement instruments are reliable, valid, and appropriate for subsequent statistical analyses and interpretation.

Table 2

Descriptive Statistics, Reliability, and Convergent Validity of Measurement Constructs

Item	Mean	Standard deviation	Factor Loading	CR	AV	MSV
Equity and Inclusion (EI)						
EI-1	3.95	1.02	.76	.810	.700	.211
EI-2	4.14	.88	.71			
EI-3	4.05	.95	.75			
EI-4	3.96	1.10	.72			
EI-5	3.82	.97	.83			
EI-6	3.34	1.00	.78			
EI-7	3.85	.82	.91			
EI-8	3.90	.93	.91			
Student well-being (SW)						
SW-1	3.86	.94	.77	.928	.696	.353
SW-2	3.90	.78	.73			
SW-3	3.87	.85	.70			
SW-4	3.92	.93	.86			

SW-5	3.88	.87	.72			
SW-6	3.61	.94	.73			
SW-7	3.86	.88	.76			
SW-8	3.83	1.04	.71			
Community Engagement (CE)						
CE-1	4.06	.95	.70	.788	.593	.391
CE-2	4.11	.82	.73			
CE-3	3.96	.93	.88			
CE-4	4.07	.82	.70			
CE-5	4.10	.80	.71			
CE-6	3.96	.80	.78			
CE-7	4.14	.76	.74			

. Source: Author's own field data (2025)

EI=Equity and Inclusion; SW=Student Welfare; CE=Community Engagement

As shown in Table 2, the descriptive statistics indicate that the mean scores for equity and inclusion (EI) ranged from 3.34 to 4.14. EI-2 ($M = 4.14$) recorded the highest mean score, reflecting strong agreement regarding respect for diversity, whereas EI-6 ($M = 3.34$) recorded the lowest mean score, indicating perceived gaps in anti-discrimination enforcement. For student well-being (SW), awareness of crisis support services (SW-4; $M = 3.92$) received the highest rating, while opportunities for student voice (SW-6; $M = 3.61$) received the lowest. Similarly, the mean scores for community engagement (CE) ranged from 3.96 to 4.14, with volunteering (CE-3; $M = 3.96$) receiving the lowest rating, suggesting comparatively weaker engagement in this area. Overall, all constructs recorded mean scores above the scale midpoint, indicating generally positive student perceptions of social sustainability.

As shown in Table 2, the internal consistency of the measurement constructs was assessed using Composite Reliability (CR). The CR values were .810 for EI, .928 for SW, and .788 for CE. All values exceeded the recommended threshold of .70, indicating good internal consistency. Convergent validity was evaluated using the Average Variance Extracted (AVE), with values ranging from .593 to .700. As all AVE values exceeded the recommended threshold of .50 and were lower than their corresponding CR values, the results provide strong evidence of convergent validity. Furthermore, discriminant validity was assessed using the Maximum Shared Variance (MSV), with values ranging from .211 to .391. As the MSV values were lower than the corresponding AVE values for all constructs, the findings confirm adequate discriminant validity, indicating that the latent constructs are empirically distinct.

Model Fit Indices

As shown in Table 3, the measurement model demonstrated an overall good to excellent fit to the data ($\chi^2/df = 2.539$; RMSEA = .039; CFI = .918; TLI = .968; IFI = .989). Although some indices, including NFI (.872), indicated a marginal fit, the remaining indices met or exceeded their recommended thresholds. The comparatively lower NFI may be attributed to its sensitivity to sample size ($N = 470$). Furthermore, more complex latent variable models tend to yield relatively lower incremental fit indices (Marsh et al., 2004). Nevertheless, as the other fit indices (e.g., RMSEA, SRMR, CFI, and TLI) demonstrated acceptable model fit, the overall structural model was considered adequate. In this context, the marginal NFI value did not undermine the validity of the estimated structural relationships.

Table 3

Model Fit Indices for Students' Perceptions of Social Sustainability Indicators

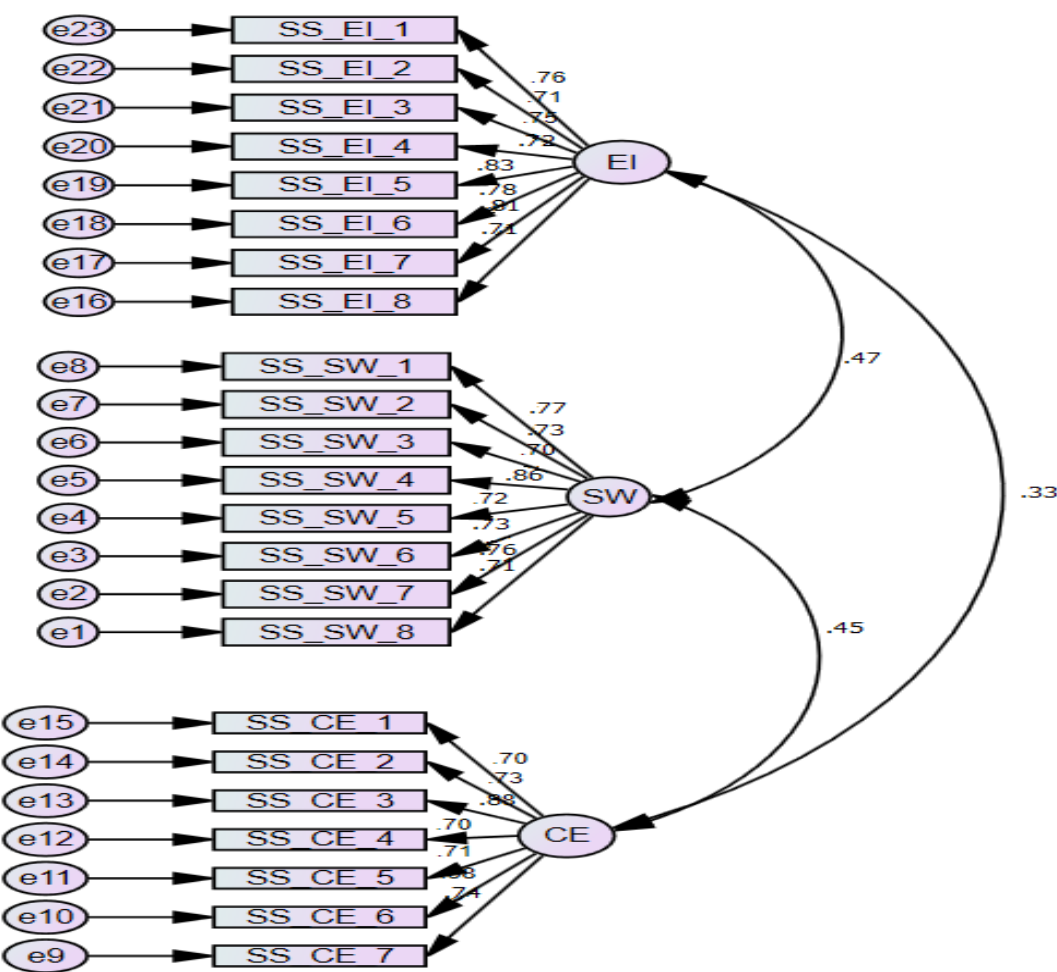
Fit statistic	Recommended	Obtained	Evaluation
Chi-Square Goodness-of-Fit Statistic (χ^2)	-	576.492	Acceptable
Degrees of Freedom (df)	-	227	
Normed Chi-Square (Relative Chi-Square) χ^2/df	<5	2.539	Acceptable
Root Mean Square Error of Approximation (RMSEA)	<0.05	.039	
p-value for Test of Close Fit (RMSEA $\leq$ 0.05) (<i>PCLOSE</i>)	>0.05	.020	Marginal
Goodness-of-Fit Index (GFI)	>0.90	.903	Acceptable
Adjusted Goodness-of-Fit Index (AGFI)	>0.80	.882	Acceptable
Root Mean Square Residual (RMR)	<0.05	.042	Good
Incremental Fit Indices			
Normed Fit Index (NFI)	>0.90	.872	Marginal
Comparative Fit Index (CFI)	>0.90	.918	Good
Tucker–Lewis Index (<i>TLI</i>)	>0.95	.968	Excellent
Incremental Fit Index (<i>IFI</i>)	>0.95	.989	Excellent

Source: Author's own field data (2025)

Structural Model: Associations among latent constructs

To address the first research objective and its corresponding hypothesis, a correlated latent variable model was specified to examine the relationships among three latent constructs: EI, SW, and CE. Figure 2 presents, the correlated latent variable model.

Figure 2
Measurement Model CFA



Author's own field data (2025)

As depicted in Figure 2, the factor loadings for EI (.71-.91), SE (.70-.86), and CE (.70-.88) all exceed the recommended threshold of .70, indicating acceptable to strong factor

loadings for their respective latent constructs. Overall, all factor loadings satisfy the minimum criterion ($\geq .70$), confirming the robustness and reliability of the measurement scales. Evidently, strong loadings for indicators such as EI-7 (diversity policies), EI-8, SW-4 (crisis support awareness), and CE-3, (volunteering involvement), demonstrate that these items are particularly effective in representing their underlying constructs.

Inter-construct Correlations and Hypotheses Testing (H1a-H1c)

The inter-construct correlations are presented in Figure 2 and reported in greater detail in Table 4. These results illustrate the relationships among the three latent constructs (EI, SW, CE), thereby addressing Research Objective One and providing evidence relevant to the corresponding hypothesis.

Table 4

Inter-construct Correlation Matrix:

Construct	EI	SW	CE
EI	1	.47**	.33**
SW		1	.45**
CE			1

*(** $p < .01$)*

Source: Author's own field data (2025)

Overall, the inter-construct correlation analysis revealed positive relationships among the latent constructs ($p < .01$), indicating statistically significant associations between the measured variables. These findings provide strong evidence of meaningful relationships within the study framework.

Hypothesis testing

H1a: *Inclusion and equity (EI) are significantly associated with student well-being (SW).*

The inter-construct correlation between EI and SW ($r = .47$, $p < .001$) demonstrates a moderate positive relationship between the two constructs. Therefore, H1 is supported. These findings underscore the importance of factors such as equitable access to learning opportunities and respect for diversity in enhancing students' well-being through policies and practices that promote supportive services, including health services, guidance, and counselling.

H1b: *Student well-being is significantly associated with community engagement.*

The moderate association between students' well-being and community engagement (SW–CE; $r = .45$, $p < .01$) indicates a significant positive relationship, thereby supporting H1b. This finding suggests that enhanced student support services, including access to

health and emotional support, are statistically associated with greater involvement in volunteering, service-learning, and socially oriented community activities.

H1c: *Equity and Inclusion are significantly associated with community engagement.*

Despite the weak-to-moderate positive correlation between equity and inclusion and community engagement (EI-CE; $r = .33$, $p < .01$), *H1c* is supported, indicating that inclusive practices, such as diversity the promotion of diversity and fair treatment, are significantly associated with students' participation in service-learning and volunteering activities. However, an inclusive environment alone appears insufficient to strongly sustain community engagement. Thus, these findings highlight the need for complementary institutional structures and programmes to strengthen this relationship.

Structural Model Estimation

The essence of the second research objective and its corresponding hypothesis was to examine the explanatory power of the latent constructs (EI, SW, and CE) in relation to social sustainability outcomes (SSO). This objective was addressed through structural equation modelling, in which EI, SW, and CE were specified as exogenous latent constructs, while SSO was specified as the endogenous construct. Figure 3 presents standardised estimates of the factors associated with SSO.

Figure 3: Structural Model of the Study

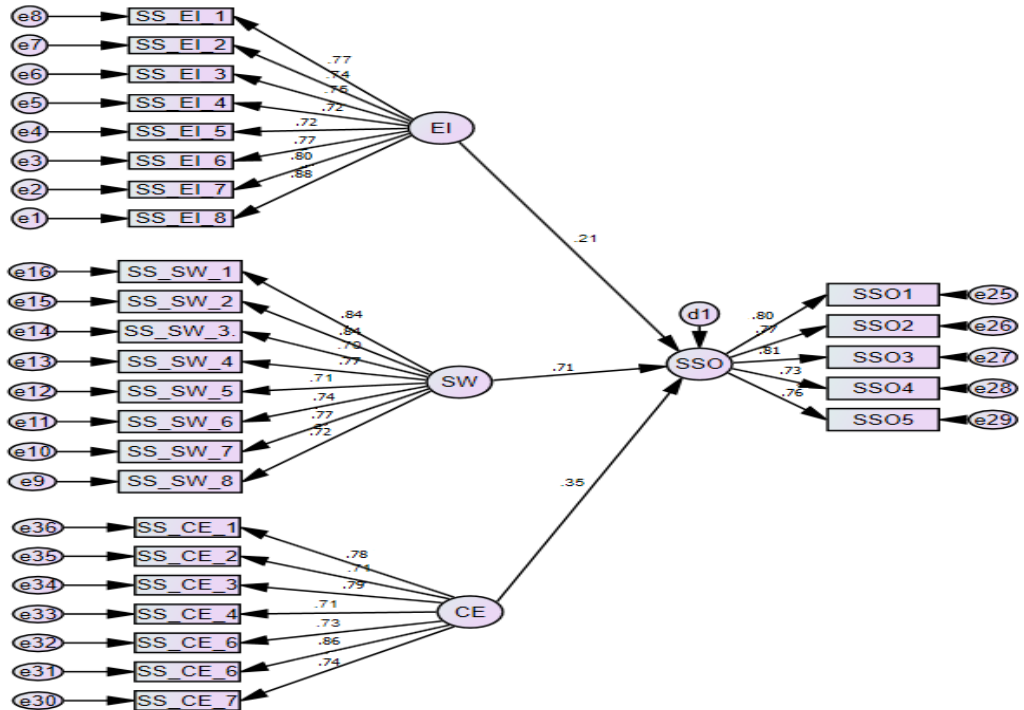


Table 5*Table 5. Standardised Structural Path Estimates (β) for Factors Associated with SSO*

Exogenous		Endogenous	Estimate	95% CI	S.E.	CR	P-value	R-Squared
EI	→	SSO	.208	[0.124,0.292]	.043	4.313	<.0001	0.666
SW	→	SSO	.706	[0.596,0.816]	.056	9.285	<.0001	
CE	→	SSO	.353	[0.249,0.457]	.053	6.578	<.0001	

Source: Author's own field data (2025)

Regarding the overall model's explanatory power, the model demonstrates that nearly 67% of the variance in SSO is explained by the exogenous variables ($R^2 = .666$), reflecting relatively strong explanatory power. Notably, the three exogenous latent variables, EI ($\beta = .21$, $CR = 4.313$, $p < .001$), SW ($\beta = .71$, $CR = 9.285$, $p < .001$), and CE ($\beta = .35$, $CR = 6.578$, $p < .01$), exert positive but varying effects on social sustainability outcomes (SSO). Collectively, these variables provide a substantial explanation of how social sustainability is perceived within the university context from students' perspectives.

Hypothesis testing

H2a: *Inclusion and equity (EI) are significant positive indicators of social sustainability outcomes (SSO)*

The structural model demonstrates that EI → SSO path exhibits a positive but relatively weak effect on SSO ($\beta = .21$, $CR = 4.313$, $p < .0001$), thereby supporting H2a. Nevertheless, although statistically significant, the relatively lower magnitude of the coefficient ($\beta = .21$) indicates that EI exerts a more indirect influence on SSO, suggesting the presence of possible indirect pathways or implementation gaps.

H2b: *Student well-being is a significant positive indicator of social sustainability outcomes (SSO)*

The SW → SSO path exerted a strong and highly significant effect on SSO ($\beta = .71$, $CR=9.285$, $p < .001$). Principally, these study findings not only support H2b but also identify SW → SSO as the dominant path in the model, emphasising that students' well-being is a key pillar of SoSu. In this regard, the findings underscore the importance of investing in student support services, such as health services, campus safety, and emotional support, as key pathways for enhancing SoSu within the university context.

H2c: *Community engagement (CE) is a significant positive indicator of social sustainability outcomes (SSO)*

CE demonstrates a moderate positive effect on SSO ($\beta = .35$, $CR = 6.578$, $p < .01$), thereby supporting H2c. Essentially, these findings highlight that students' participation in service learning, volunteering, and university-community partnerships initiatives significantly contributes to institutional social responsibility.

Discussion

The study findings, based on the descriptive analysis, showed mean scores above the midpoint, indicating generally positive perceptions of social sustainability. However, lower ratings for anti-discrimination enforcement (EI-6, $M=3.34$), students' voice in well-being decisions (SW-6, $M=3.61$), and volunteering opportunities (CE-3, $M=3.96$) reveal a perception-practice gap. According to the WIA perspective (UNESCO, 2020; 2024), this suggests only partial integration of social sustainability, with fragmented implementation making policies like anti-discrimination largely invisible in daily operations.

Correspondingly, this policy-practice gap reflects the findings of previous studies. For example, Swanzy et al. (2019) reported in Ghana that inclusion policies often fail because of resource shortages, including inadequate funding for equity initiatives. Similarly, Wolff and Ehrström (2020) documented that funding constraints hinder the transformative potential of African higher education, while Maoela et al. (2024) highlighted gaps between SDG awareness and meaningful engagement. Collectively, these findings suggest that, although students hold generally positive perceptions, opportunities for meaningful participation remain limited. This indicates that socially sustainable universities require well-aligned policies, adequate resource allocation, and stronger university-community partnerships.

The inter-construct correlations (EI-SW, $r = .47$; SW-CE, $r = .45$; EI-CE, $r = .33$) demonstrate significant positive associations, thereby supporting H1a-H1c. These findings are consistent with the WIA framework for sustainability (UNESCO, 2020; 2024), in which equity and inclusion support students' well-being, which in turn enhances community engagement. Similarly, Spănu et al. (2024) and Chaudhry et al. (2024) reported positive relationships between inclusivity, well-being, and institutional support systems. Furthermore, Machimana et al. (2020) found that youth engagement promotes inclusivity, while Bronfenbrenner's (1979) Ecological Systems Approach (ESA) explains how interactions across the macro, meso, and micro-level systems shape sustainable university environments.

Markedly, the SEM analysis indicated that all constructs positively predicted SSO, albeit to different extents: SW ($\beta=.706$, strong), CE ($\beta=.353$, moderate), and EI ($\beta=.208$, small), thereby supporting H2a-H2c. In addition, from the perspective of the WIA framework (UNESCO, 2020; 2024), the strong influence of SW highlights the central role of student

support in promoting holistic sustainability, with factors such as campus safety, workload balance, and health services enhancing both engagement and inclusivity. Furthermore, through the lens of using Bronfenbrenner's (1979) ESA, SW reflects proximal microsystem influences, whereas EI and CE operate through more distal ecological systems. Consequently, the findings are consistent with UNESCO (2022a, 2022b), Soutter et al. (2014), and Tafese and Kopp (2025), who emphasise that well-being is multidimensional and fundamental to sustainable educational environments.

Implications and Limitations

This study extends the social sustainability literature and provides practical implications for Tanzanian universities. The strong effect of student well-being on social sustainability outcomes (SSO) ($\beta = .71$, $CR = 9.285$, $p < .001$) highlights the need for comprehensive student support systems, including health services, campus safety, counselling, and academic support. Consistent with the Whole Institution Approach (WIA) (UNESCO, 2020, 2024) and UNESCO (2022a), student well-being should be embedded in institutional governance and curricula. The comparatively lower level of student participation indicates the need for stronger mechanisms for student voice, while the positive relationship between equity and inclusion and community engagement supports policies that integrate inclusive practices with service-learning initiatives (Machimana et al., 2020; Spănu et al., 2024).

At the policy level, national quality assurance and funding frameworks should incorporate social sustainability indicators to strengthen institutional accountability and elevate this often-overlooked pillar of sustainable development (Chakra, 2025; Wolff & Ehrström, 2020). The model's explanatory power ($R^2 = .666$) further underscores the importance of strengthening university-community partnerships to enhance mesosystem linkages, as proposed by Bronfenbrenner (1979). More broadly, these findings contribute to the implementation of SDGs 3 and 4 by informing student-centred policies in resource-constrained higher education settings (UNESCO, 2022b; Tafese & Kopp, 2025).

Despite these contributions, several limitations should be acknowledged. First, although structural equation modelling supported the proposed relationships, the cross-sectional design limits causal inference; therefore, the findings should be interpreted as structural associations rather than evidence of causality. Second, the convenience sample recruited through electronic platforms, although relatively large ($N = 470$), may be affected by self-selection and non-response bias, limiting the generalisability of the findings beyond Tanzanian public universities (Etikan et al., 2016). Third, the marginal model fit indices ($NFI = .872$; $PCLOSE = .020$) and the unexplained variance in SSO (33%) suggest that additional dimensions of social sustainability, such as human rights, cultural identity, and democratic participation, may strengthen future models (Nilsson et al., 2024). Future research should employ longitudinal, experimental, or mixed-methods designs,

extend investigations across multiple institutions, and further refine the measurement instruments to enhance causal interpretation, validity, and policy relevance (UNESCO, 2021; Wolff & Ehrström, 2020; Chaudhry et al., 2024).

Conclusion and Recommendations

This study provides empirical evidence of social sustainability in Tanzanian universities from students' perspectives, revealing generally positive perceptions alongside implementation gaps in equity and inclusion, student well-being, and community engagement. The significant relationships among these dimensions, together with the finding that student well-being is the strongest predictor of social sustainability outcomes, reinforce the interconnected nature of these pillars. These results support the Whole Institution Approach (UNESCO, 2020, 2024) and Bronfenbrenner's (1979) ecological systems theory, which position student well-being as a foundation for sustainable educational environments.

Accordingly, universities should prioritise policies that strengthen student well-being through accessible counselling, mental health services, academic support, and inclusive campus environments. They should also enhance equity and inclusion by expanding equitable learning opportunities, inclusive support services, and meaningful student participation in institutional decision-making. Furthermore, integrating service-learning, community-based projects, and university-community partnerships into academic programmes can strengthen community engagement. At the national level, higher education authorities should embed measurable indicators of equity, student well-being, and community engagement within institutional quality assurance and sustainability monitoring frameworks to improve accountability and advance social sustainability across higher education institutions.

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