

Compassionate Innovation: Ethics, Care & Youth-Led Social Impact – Human-First Systems and Technologies

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Abstract— *The study explains the role of ethical values, care-based solutions and human centered technologies in bringing compassionate innovation and enhancing the social outcomes. The quantitative method is used to study the data of the research: data have been collected by the means of a structured questionnaire, which included 200 respondents, and they were analyzed by using the SPSS tools: the mean, standard deviation, correlation, and regression. By the findings, it is possible to say that care-based approaches and ethical principles can be used to a great extent in the design and realization of new technologies, and human-centered technologies might have a positive impact on social life and community building. Also, positive and significant correlation was found between positive ethical innovation practices and sustainable social impact. These results suggest that the ethically, emphatically and human-based innovation can positively influence the development that is both inclusive and sustainable. The study concludes that the implementation of compassion, ethical responsibility and participatory strategies in the process of innovation are essential in creating the socially responsible and sustainable technological systems.*

Keywords– *Compassionate Innovation, Ethical Values, Human-Centered Technologies, Sustainable Social Impact, Social Well-being.*

I. INTRODUCTION

Compassionate Innovation is a change paradigm where technological development is not focused as much on profit but rather on empathetic, ethical, caring, and human-centered aspects. In the simplified version, it underlines the fact that innovation should not simply be capable of effectively addressing problems, but it should approach such a task in a manner that respects human dignity, inclusivity, and social justice [1]. The ethical issues are seen as revolutionary, rather than as facilitating, and the technologies will not keep inequality and marginalization going. Care is regarded as a relational process in this case, an active process, i.e. listening to communities, understanding what it is like to live and working to get solutions [2]. Human-first systems therefore attach priority to accessibility, transparency and fairness and technological innovations must be brought to the standards of the larger society. The approach is particularly timely when the role of artificial intelligence and data systems as well as digital infrastructures in everyday life becomes prominent [3].

There is more than just the need to adhere to regulations in compassionate innovation, but a proactive stance on the matters of morality and social influence. Innovators, researchers, and developers should anticipate potential harms, prejudice, and unintended consequences, which may exist in systems [4]. One such instance is the continued use of discrimination through algorithmic bias in AI systems, where considerations of ethical protection are not applied in the design and implementation. Fairness, accountability,

transparency, and explainability (commonly known as FATE) are all examples of ethical considerations in the development of responsible technologies [5]. Moreover, the participatory ethics would encourage collaboration with as many stakeholders as possible, including minority populations, so that the innovation would be pluralized. This has created a culture of trust and responsibility and has enhanced the idea that technological development should be employed to the benefit of all sectors of the society and not a few [6].

Social impact initiatives that are initiated by the youth can play a transformational role in fostering compassionate innovation. The young generation can make new discoveries, technologies, and social accountability to resolve key problems in the world such as climate change, inequality, and digital exclusion [7]. With the increasing access of digital tools and platforms by more youth, young people are not merely consumers of technology but also creators and changemakers. They are more interdisciplinary and are aimed at integration of technology with social entrepreneurship to realize the scalable and community-centered solutions [8]. It is worth noting that the concepts of sustainability, inclusivity, and collaboration are values that are more likely to be promoted by young led movements and are very close to the principles of compassionate innovation. The involvement sustains the innovation-ecosystems dynamic, progressive, and sensitive to new demands in society [9].

Human-first systems and technologies introduce compassion into the picture because they incorporate care in design processes and outcomes. These should include user

intuitive and inclusive designs and assistance technologies to support differently-abled persons and digital access to socio-economic barriers [10]. It also involves the adoption of such concepts as universal design aiming at ensuring that products would be accessible to as many people as possible. In addition, the care technologies are often in the form of apps, such as mental health apps, video conferencing, and community support systems. The human needs and experiences are considered, which is why these systems are not evaluated based on the efficiency, but on the well-being, empowerment, and social impact [11].

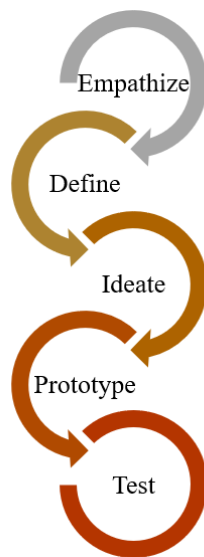


Figure 1. Stages of Design Thinking
Source: ruralhandmade.com [12]

The caring innovation would demand cultivating and comprehensive integration of morals, care and generational connections in technology cycles. It breaks down traditional ideas about innovation by reconceptualizing success both through economic growth and social good and human flourishing [13]. To achieve moral consciousness, guided design driven by compassion, and involvement of young people, schools, policy-makers and business executives must join efforts to create the conditions in which these should be cultivated. This will include inculcation of ethics in STEM education, sponsoring youth to drive projects, and establishing governing systems that will hold the technology development to account [14]. As societies continue to navigate through troublesome periods in the international arena, the humane innovation is not an immediate answer - a long term solution, a sustainable and human solution, technology must be of service to the people and not vice versa.

II. LITERATURE REVIEW

The current discourse of responsible and ethical innovation recognizes an increasing number of ethical and responsible innovations as highly relational processes with value-

connoted processes rather than being a market-driven technical activity. The literature literature on Responsible Innovation has emphasized how innovation occurs in an intricate socio-technical and ecological context and interdependence, unpredictability and moral responsibility need to be factored. Narayan and Datta (2026) [15] expand on this opinion by using Nagarjuna philosophy to develop a system of Compassionate Innovation Framework (CIF) on the grounds of sunyata (non-essentialism), pratityasamutpada (dependent origination), and karuna (compassion). Their theory invests innovation back in as a relationship activity and poses compassion as an organizational skill set, which is composed of conscientiousness, mindfulness, and vigilance. In the same way, Steele and Rickards (2021) [16] introduce Ethical Innovation as a normative system in accordance with sustainable development objectives and point at the necessity of responsible, attentive, disruptive, authentic, and regenerative (RADAR) innovation practices. Collectively, such contributions help move the debate out of linear models of innovation, to more relational and systems-based models that preempt ethical resilience and societal long-term well being.

Along with these theoretical changes, the growing pace of artificial intelligence progress has heightened anxieties into the ethical context of the innovation process, and especially the human dignity, autonomy, as well as emotional well-being. Ciriello, Chen, and Rubinsztin (2025) [17] review the revolutionary role of generative AI and propose a scheme of compassionate AI design, governing, and usage based on the ethics of compassion of Schopenhauer. Their publication accentuates the two-sided character of AI systems, which may imitate empathy and improve service provision in industries like healthcare and marketing, but may also become hazardous when it comes to manipulating emotions, addiction, and the loss of privacy. The authors emphasize the need to redistribute the advantages and the disadvantages of AI, especially to the vulnerable stakeholders, and propose governance frameworks that support human prosperity. This is in line with the general criticisms of anthropocentric ethics in innovation, including Deckha (2026) [18], who argues against the shortcomings of human-first models and offers an interspecies justice framework based on relational ethics. All these views serve to emphasize how innovation ethics needs to be re-conceptualized to go beyond human-focused approaches and extend to encompass ecological and social interdependencies on a larger scale.

Compassion has turned out to be a pertinent value in the educational and capacity building field that promotes an inclusive and transformative learning experience, which facilitates ethical innovation. According to spaeth (2024) [19], inclusive teaching involves compassionate pedagogies because it is necessary to cope with the multiplicity of student experiences and the two-empathy problem. The investigation of dominant discourses on the ideal student by questioning

such discourses, the study reveals how compassion tends to be selectively applied, which further supports practices of exclusion. In line with this, Donaldson, Lee, and Jamal (2025) [20] suggest one possible framework, called design-thinking praxis, which combines systems thinking, care ethics, and justice-related concepts into the framework of tourism education. Their results show that multidimensional empathy, collaborative problem-solving, and ethical awareness may be developed in students through the use of experiential and reflective learning strategies when they are exposed to the complex sustainability issues. Besides, Purcell et al. (2025) [21] build upon this discussion by stating the importance of youth-led innovation in education of sustainable development (ESD). Their Theory-of-Change model emphasizes the value of mentorship, inter-sector relationships and curriculum integration in helping to enable young innovators to overcome challenges of global sustainability. All these studies put compassion as an ethical value and a pedagogical instrument to bring up future innovators that can solve multifaceted issues in the life of the society.

The incorporation of compassion in business activities and leadership has been of high concern at the organizational level, especially within the scope of corporate social responsibility and virtue ethics. Based on Taoist philosophy, Zu (2022) [22] views compassion as a main virtue related to responsible business practices, highlighting its impact on the development of empathy, empowerment, and ethical leadership. The example of the YKK cycle of goodness clearly show that, even within the social responsibility, compassion may positively improve the performance of the organization. In a similar manner, Steen, Sand, and Van de Poel (2021) [23] advocate the use of virtue ethics in responsible innovation by stating that the critical virtues that must be applied to handle the conflicts between being a risk-taker and being responsible are justice, inclusion, courage, and practical wisdom (phronesis). Krause, Rousset, and Schafer (2023) [24] enhance this story by looking at the paradoxes of compassionate leadership in hierarchical organizations. Their observations indicate that compassion is not a simple management instrument but a multidimensional process within interpersonal relationship dependent on the power relations and leaders should continually balance between their caring and authoritative behaviors. All these studies point to the fact that even though compassion could contribute to the effectiveness of organizations and ethical behaviors, it also brings about new challenges that require delicate and situation-specific solutions.

Although the approaches based on compassion and focusing on humanity are increasingly emphasized, critical views warn of simplistic presumptions about their usefulness. The empirical case presented by Al Kakoun et al. (2021) [25] indicates the possibility of a negative effect of engineering students being primed to human-centered design, including a reduction in social awareness. This result highlights how

established professional values and the ineffectiveness of interventions may have short-term effects in developing empathy. On the same note, Swist and Collin (2021) [26] also stress that responsible design and innovation involves ongoing interaction with moral values and participatory actions instead of the shallow implementation of human-centered models. In their analysis, they emphasize the need to empower the communities and prepare them to have collective responsibility in solving complex socio-ecological issues. Collectively, the literature unearths a sophisticated and dynamic concept of compassion in innovation in which it acts as an ethical necessity and strategic ability. Nevertheless, its successful application involves stronger structural changes in institutional practice, education and governance systems so that innovation has a significant role to play to provide inclusive, sustainable and fair futures.

III. RESEARCH METHODOLOGY

The study employed a quantitative research method to examine the aspects of compassionate innovation among various stakeholders in the Delhi NCR area of India. The target audience included innovators of youth, technological developers, students, researchers, social entrepreneurs, and people who worked on emerging technologies and social innovation projects. The stratified random sampling method was used to ensure representation across these diverse groups, with 200 respondents being utilized. The study design was descriptive and analytical, which allowed for gaining a deep insight both into patterns and into the relationship between variables. Information was then obtained by primary and secondary sources, and primary data was obtained using a close-ended structured questionnaire so that the information obtained was consistent and easy to analyze. In cases of statistical analysis, Microsoft Excel and SPSS 27 were used. The study utilized statistical methods such as the mean, standard deviation, regression, and correlation to process and derive meaningful conclusions from the answers.

3.1 Objective of the Study

1. To analyze the influence of ethical values and care-based approaches in the design and implementation of emerging technologies.
2. To investigate the impact of human-centered technologies on social well-being and community development.
3. To assess the relationship between ethical innovation practices and sustainable social impact in technology-driven environments.

3.2 Hypothesis of the Study

H1: Ethical values and care-based approaches have a significant positive influence on the design and implementation of emerging technologies.

H2: Human-centered technologies have a significant

positive impact on social well-being and community development.

H3: Ethical innovation practices have a significant positive relationship with sustainable social impact in technology-driven environments.

3.3 Conceptual Framework

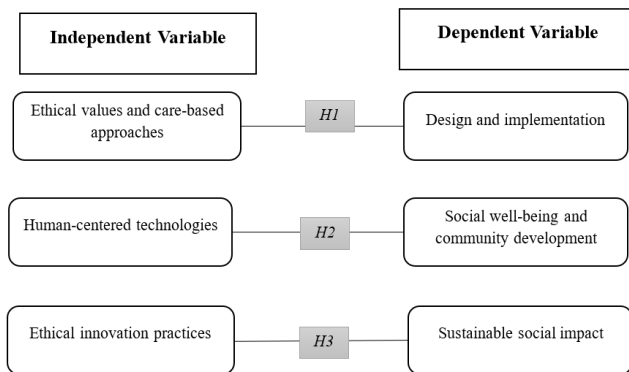


Figure 2. Conceptual Model
Source: Author's own compilation

IV. RESULT

Table 1. Demographic Characteristics

S.No	Demographic Characteristics		N	%
1	Gender	Male	107	53.50%
		Female	93	46.50%
2	Age Group	18–22 years	48	24%
		23–27 years	41	20.50%
		28–32 years	46	23%
		33–37 years	29	14.50%
		38 years and above	36	18%
3	Occupation	Student	42	21%
		Technology Developer	36	18%
		Academic	37	18.50%
		Social Entrepreneur	48	24%
		Corporate Professional	37	18.50%
4	Years of Experience	Less than 1 year	46	23%
		1–3 years	33	16.50%
		4–6 years	33	16.50%
		7–10 years	40	20%
		More than 10 years	48	24%

S.No	Demographic Characteristics		N	%
5	Involvement in Innovation Activities	Actively involved	46	23%
		Occasionally involved	49	24.50%
		Not involved but interested	50	25%
		Not involved	55	27.50%

The sample of the respondents is relatively balanced and diverse. Regarding gender, there is near gender parity with a slightly bigger percentage of males (53.5) versus females (46.5). The age distribution indicates that respondents occupy various stages in their lives with the highest respondent count on the 18-22 years (24%), 28-32 years (23%) categories, and then the 23-27 years (20.5%). Smaller shares are observed among the 33-37 years (14.5%), and 38 years and above (18%) age groups indicating a combination of younger and moderately experienced age groups. Concerning occupation, social entrepreneurs constitute the highest proportion (24%), and then comes the students (21%), academics (18.5%), corporate professionals (18.5%), and technology developers (18%) all occupy an almost equal place. Regarding the experience, the greatest percentage of respondents have over 10 years' experience (24) and below 1 year experience (23), which means that both new entrants and people with extensive experience are represented. Finally, there is a uneven distribution in the participation in innovation activity with the highest proportion of 27.5 percent of those not participating, the next most (25 percent) interested but not participating, or occasionally (24.5 percent) participating, and those actively participating (23 percent).

Outcomes Based on Objective and Hypothesis

Obj. 1: To analyze the influence of ethical values and care-based approaches in the design and implementation of emerging technologies.

H1: Ethical values and care-based approaches have a significant positive influence on the design and implementation of emerging technologies.

Table 2. Model Summary Table

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.385 ^a	.149	.144	2.23344
a. Predictors: (Constant), Ethical values and care-based approaches				

The model summary shows that there is the moderate positive relationship between ethical values and care-based approaches with the dependent variable according to R value of 0.385. The value of R squared of 0.149 indicates that the

predictor accounts for almost 14.9 percent of the variation in the dependent variable which is a very small degree of explanatory power. The Adjusted R Square (0.144) is marginally lower and it takes into consideration the sample size and makes sure that the model is quite stable and reliable. Nevertheless, as much of the variance (approximately 85) has not been accounted, then there are other factors that can also

have a substantial impact. The Standard Error of the Estimate (2.23344) reflects the average difference between the actual values and the predicted values, which consists of a reasonable amount of prediction accuracy, but also implies some dispersion. On the whole, the model shows a significant but insignificant role of ethical values and care-based approaches in forecasting the dependent variable.

Table 3. ANOVA^a Table

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	172.303	1	172.303	34.542	.000 ^b
	Residual	987.677	198	4.988		
	Total	1159.980	199			
a. Dependent Variable: Design and implementation						
b. Predictors: (Constant), Ethical values and care-based approaches						

The outcomes of ANOVA show that the regression equation has a statistically significant predictive value of design and implementation basing on ethical values and care-based methods. The F-value of 34.542 with a significance level (Sig.) of 0.000 ($p < 0.05$) shows that the overall model is quite significant and is not as a result of random chance. This implies that overall, the ethical values and care-based approaches have a significant effect on the

dependent variable. The regression sums of squares (172.303) relative to the residual sum of squares (987.677) indicates that the model accounts a part of the variance in design and implementation, but a greater part of it is not accounted. In general, the results affirm that the predictor variable has a significant contribution to the explain variation in design and implementation which justifies the validity of the regression model.

Table 4. Coefficients^a Table

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.570	.685		8.125	.000
	Ethical values and care-based approaches	.361	.061	.385	5.877	.000
a. Dependent Variable: Design and implementation						

According to the coefficients table, ethical values and care-based approaches are statistically significant with a positive impact on design and implementation. The unstandardized coefficient B (= 0.361) implies that as ethical values and care-based approaches elasticity increase by one unit, the increment in design and implementation will be 0.361, other factors remaining constant. This standardized coefficient (Beta = 0.385) indicates that there is a moderate positive effect of the predictor on the dependent variable. This relationship is very high, and not by chance, as the t-value of 5.877 is significant with the level of 0.000 ($p < 0.05$). Besides, the constant (5.570) can be interpreted to mean that in the absence of the predictor, the design and implementation level is positive. Altogether, the findings indicate that the ethical values and care-based methods represent meaningful and meaningful contribution to

designing and implementation improvement.

Obj. 2: To investigate the impact of human-centered technologies on social well-being and community development.

H2: Human-centered technologies have a significant positive impact on social well-being and community development.

Table 5. Model Summary Table

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.441 ^a	.195	.191	2.36503
a. Predictors: (Constant), Human-centered technologies				

The summary of the model reveals that human-centered technologies are moderately positively related to the dependent variable and the R value is 0.441. The R SQ of 0.195 indicates that about 19.5 percent of the variation in the dependent variable can be attributed to human-centered technologies meaning a weak although better explanatory power than models with less strength. The adjusted R square (0.191) is slightly less which proves that the model is consistent when adjusted by the sample size. Nevertheless, a

large fraction of variance (approximately, 80.5) is not explained, and it is suggested that additional variables affect the result as well. The Standard Error of the Estimate (2.36503) indicates the average variation between the observed and the predicted values indicating that there is reasonably good accuracy in prediction but some variation. All in all, this model proves that the role of human-centered technologies in explaining the dependent variable is significant and statistically significant, yet moderate.

Table 6. ANOVA^a Table

ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	267.908	1	267.908	47.897	.000 ^b
	Residual	1107.487	198	5.593		
	Total	1375.395	199			
a. Dependent Variable: Social well-being and community development						
b. Predictors: (Constant), Human-centered technologies						

The findings of ANOVA prove that the regression equation is statistically significant in estimating social well-being and community development in terms of human-centered technologies. The factors of F-value that equals 47.897 and the level of significance is 0.000 ($p < 0.05$) indicate that the model is very significant and valid in that the predictor variable plays a significant role in the outcome. The regression sum of squares (267.908) in relation to the residual

sum of squares (1107.487) is used to infer that human centred technologies have an important part to play in explaining the variance in social well being and community development, although still a bigger proportion is not known. Altogether, the results prove the influence of human-centered technologies on improving social well-being and improvement of the community as the validity of the regression model is proven.

Table 7. Coefficients^a Table

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.085	.702		7.242	.000
	Human-centered technologies	.463	.067	.441	6.921	.000
a. Dependent Variable: Social well-being and community development						

According to the coefficients table, human-driven technologies positively affect social well-being and community development, with the effect being statistically significant. The lack of standardization of the coefficient ($B = 0.463$) means that an increase of one unit in human-centered technologies gives rise to the increase in social well-being and community development by 0.463 unit, keeping other factors constant. The standardized coefficient ($Beta = 0.441$) indicates a positive impact of the predictor variable of moderate to high strength. The t-value (6.921) and a significant level of 0.000 ($p < 0.05$) are the data that help to state that this relationship is very significant and is not an accident. Also, the constant value (5.085) indicates that regardless of the absence of human-centered technologies, the social well-being and community development have some kind of a bottom line. In general, the findings show that

human-oriented technologies are meaningful and significant in improving social well-being and community building.

Obj. 3: To assess the relationship between ethical innovation practices and sustainable social impact in technology-driven environments.

H3: Ethical innovation practices have a significant positive relationship with sustainable social impact in technology-driven environments.

Table 8. Descriptive Statistics Table

Descriptive Statistics			
	Mean	Std. Deviation	N
Ethical innovation practices	9.3550	2.98219	200
Sustainable social impact	10.8400	2.51915	200

Descriptive statistics show that the average of ethical innovation practices is 9.3550, standard deviation of 2.98219 and hence, there is a moderate level of variation in the perceptions of the respondents. Comparatively, sustainable social impact has a greater mean value of 10.8400 and a smaller standard deviation of 2.51915, which implies that respondents have a more positive image of sustainable social impact with a less diverse perception of it. The smaller

standard deviation of sustainable social impact means that the answers will be more consistent, whereas the ethical innovation practices have slightly higher variability of the opinions. The sample size of the two variables ($N = 200$) is comparable. All in all, the findings indicate that sustainable social impact is rated more and more consistently as compared to ethical innovation practices among the respondents with both constructs being rated favorably.

Table 9. Correlations Table

Correlations			
		Ethical innovation practices	Sustainable social impact
Ethical innovation practices	Pearson Correlation	1	.261**
	Sig. (2-tailed)		.000
	N	200	200
Sustainable social impact	Pearson Correlation	.261**	1
	Sig. (2-tailed)	.000	
	N	200	200

** . Correlation is significant at the 0.01 level (2-tailed).

The correlation between ethical innovation practices and sustainable social impact has a positive correlation which is statistically significant as indicated by the correlation analysis. The Pearson correlation result ($r = 0.261$) shows a low to moderate positive relationship meaning that sustainable social impact has a tendency to improve as the ethical innovation practices also increase. The significance figure ($p = 0.000$) is lower than 0.01, which proves that this relationship is statistically significant at a level of 1% (2-tailed), that is, it can hardly be expected to have occurred due to chance. The connection between the two variables is not very high; however, it indicates a significant correlation between them. On the whole, the results suggest that encouraging the ethical innovation practices are capable of having a positive effect on attaining the sustainable social impact, though other variables might also affect the association.

V. DISCUSSION

The discussion provides the theoretical and conceptual importance of ethical values, care-based practices, and human-centered technologies in the development of modern innovation systems. The available literature is emphatic in declaring that innovation is no longer about efficiency or profit maximization but it is becoming more directed by the ethical accountability and human welfare. As an example, Gur, F. A. (2026) [27] discusses the fact that compassion is a vital facilitator of innovation, as it brings about a solution that is inclusive, empathetic, and socially responsive. Likewise, Kosiol et al., (2024) [28] demonstrate that more effective innovation is based on care and empathy because it focuses

on human experiences and pain. Similarly, Rebecchi et al. (2024) [29] state that responsible and sustainable innovation is guaranteed by the inclusion of ethical principles like fairness, accountability, and transparency in technological systems. All these views imply that care-based and ethical approaches are not marginal to the evolution of significant and influential technologies but central ones. In addition, Da et al., (2022) [30] conceptualize ethical innovation as a relationship grounded in compassion, mindfulness, and systemic awareness, which supports the notion that the innovation should be consistent with the larger societal and moral values.

Moreover, the importance of human-oriented technologies and ethical practices in terms of enhancing the well-being of society and sustainability has been broadly recognized in the previous studies. Li et al. (2023) [31] demonstrate that the human-centered design can facilitate empathy and social awareness, which help technologies to accommodate the needs of various users better. In a similar vein, Robina-Ramírez et al., (2025) [32] point out that, the youth-led and participatory innovation strategies and models can help in the development of sustainable development through the incorporation of community consideration in the technology. Similarly, Oehring and Gunasekera (2022) [33] establish that organizational compassion practices reinforce social responsibility and long-term performance, which means that ethical factors are tightly connected with the good performance of society. Besides, (Ciasullo et al., 2020) [34] underline that the care-based and ethical frameworks of responsible innovation can empower the community and respond to complex socio-economic issues. These studies as a whole demonstrate that human-centered technologies and

ethical innovation practices are transformative in how they can be used to affect a sustainable social impact and community development. They emphasize the need to integrate empathy, inclusiveness, and responsibility into innovation ecosystems to make sure that technological progress is applied to the welfare of collectives and social justice Castro-Arce and Vanclay (2020) [35].

VI. CONCLUSION

The study concludes the critical role of the ethical values, care-based and human-centered technologies to be integrated into the modern innovation ecosystems to deliver meaningful and sustainable results to society. It strengthens the notion that innovation can no longer be a strictly technical and profit-oriented process, but become more of a focus on human benefit, diversity, and social responsibility. The focus on ethical practices in innovation makes the study underline the role of compassion, empathy, and accountability as the core factors that can be used to develop effective technologies that are also equitable and socially central. Moreover, the aspect of human-centered design can also be viewed as one of the most critical factors that contribute to improving social welfare and community building, so that the development of technologies can be in line with actual human needs and lived experiences. The study also identifies the increased topicality of the youth involvement and participatory methods in the development of innovative solutions, which can be described as dynamic, inclusive and future-oriented. On the whole, the results can add to the general discussion on compassionate innovation by showing that the combination of ethics, care, and human-centered thinking is crucial to creating resilient, fair, and sustainable technological infrastructures that will be beneficial to the society in general.

Implication, Limitation and Future Research Direction

The study has significant implications because it underscores the fact that the interventions of ethical values, care-based strategies and human-centered design are key in ensuring sustainable, inclusive and socially responsible innovation. It recommends that policy makers, teachers and practitioners in the industry ought to instill ethical awareness, integrate these values in the technological development and education and foster participatory and youth-led innovation practices. Nevertheless, the article also possesses a number of limitations such as: it functions within a certain geographical area and utilizes self-reported data, which is, therefore, prone to bias; it also incorporates a set of a limited amount of variables that may be insufficient to describe the complexity of the innovation ecosystems. Thus, the future research can contribute to the more diverse and larger samples in various regions, the inclusion of other variables to be considered, including organizational, cultural, and policy factors, and a longitudinal or mixed-method methodology that could provide deeper, more comprehensive, and generalizable

information about ethical and human-centered innovation.

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