



A Grounded Theory Study Exploring Why and How the UNEP Young Champions of the Earth Create Sustainable Innovations for a Flourishing Planet

Nakita Bruno Green

(Maharishi International University, Commonwealth of Dominica)

Abstract

In recent years there has been increased dialogue on the urgency of grand challenges and the role of sustainable innovations in facilitating sustainable development and creating a flourishing world. Individuals are central to this phenomenon in that they provide the ideas and actions which build innovations that alleviate social challenges, facilitate environmental restoration, and drive a new model of economic prosperity. Nonetheless, many scholars agree that the sustainable innovation and sustainable development literature are limited by a restricted epistemology that lacks a theoretical understanding of why and how individuals pioneer sustainable development as well as a multilevel approach to sustainable innovation. A more refined understanding of this phenomenon at the individual and multi-level can offer the insights necessary for mankind to transcend existing grand challenges.

This paper presents a grounded theory study on why and how the United Nations Environmental Program (UNEP) Young Champions of the Earth (YCE) award winners create innovations for a flourishing planet. The UNEP YCE have successfully tackled several of the UN's Sustainable Development Goals (SDGs) globally. The data revealed that the YCE award winners experienced grand challenges at the macro-level which triggered micro-level feelings, emotion, and cognition that then drove them to create synergy with others at the mesa level, leverage their full potential, and innovate responsibly for social and environmental evolution. These findings were used to construct a 4 E Process model where sustainable innovations are created through four processes: Entangling, Enlightening, Enacting, and Evolving. These findings enrich the academic literature in several ways.

Keywords: Sustainable Development Goals, Sustainable Innovation, Grand Challenges, Flourishing

Purpose

Over the last few decades, the environmental and socio-economic challenges facing our planet have become increasingly more pronounced. In 2019, fossil CO₂ emissions reached 36.7 gigatons globally, over 62% higher than in the 1980s when the World Commission on Economic Development advocated for sustainable development (WMO, 2020). Greenhouse gas emissions are at their highest in three million years and continue apace while the average global mean surface temperature for 2016-2020 was the warmest four-year period ever recorded. Catastrophic

tropical cyclones have inflicted unprecedented economic loss and social and environmental upheaval while wildfires resulted in the greatest ecological and economic losses on record. Furthermore, scientists predict that by 2050 the lives of nearly 1.6 billion people will be threatened by floods while between 2.7 to 3.2 billion people will live in severe water scarce areas. Anthropogenic climate change threatens life-sustaining systems, across the entire globe but it is the direct effects such as deaths and climate induced migration which are the most agonizing (WMO, 2020). Scholars across various disciplines agree that these grand challenges demand immediate and radical attention (George et al., 2016; Rockström et al., 2009). Nevertheless, both the practical management and academic literature have yet to offer a theoretical understanding or clear roadmap that aspiring innovators and entrepreneurs can use to create a flourishing world.

Despite the urgent need to create sustainable innovations that resolve grand challenges the subject of sustainable innovation has not been adequately examined (Wright & Nyberg, 2017). Most of the scientific research in this area is centered on what drives sustainable innovation from the meso and macro levels, while the micro-level processes which facilitate sustainable innovation have been ignored. Consequently, understanding why and how the UNEP YCE have created innovations that are well aligned with the goals of sustainable development is critical as this knowledge may direct future efforts towards sustainable development. This study extends the sustainability literature and advances management scholarship on the SDG's by presenting findings from an exploration of sustainable innovations created in diverse global settings, at the micro-level and across levels.

Addressing a Research Problem

In 1995 the Academy of Management Review published its first special issue on sustainability in which many contributors argued that management scholarship in this discipline was too focused on a single level of analysis and recommended analyzing systems and multilevel interactions instead (Shrivastava, 1995; Starik & Rands, 1995). Since then, this same critique of sustainability research has persisted, particularly as it relates to research that focuses on the micro-level (Sharma, 2002; Howard-Grenville et al., 2019). For example, in a review of 588 journal articles and 102 books on responsibility and sustainability published from 1970 to 2011 only four percent of studies were at an individual or micro-level and five percent on two or more levels (Aguinis & Glavas, 2012). Similarly, Bansal and Gao (2006) found that in 79 publications in high impact journals only six percent of studies were at the individual level and nineteen percent crossed levels (Bansal & Song, 2017). Recently, in 2019, another special issue on sustainable development was published by the Academy of Management Discoveries. There, the editors urged that there should be more work done at the microlevel of analysis as knowledge is needed to understand how people suffer or thrive as individuals (Howard-Grenville et al., 2019).

Similarly, in the groundbreaking article on grand challenges, George et al., (2016) posit that actors operate at multiple levels: at the individual level, community level, country or regional level, the global level, and that their actions have multi-level influences. Hence, they are significant in solving Grand Challenges and in the attainment of the SDGs. In a discussion on transformative innovation, Bright et al., (2006) also brought attention to the individual as a key driver of

transformative innovation. They explained that the influence of the individual is translated to the group, the mesa system, and to the organization the macro-system. Furthermore, a prominent example showcasing the significance of the individual's internal dynamics is presented in a study of the UN Climate Change Summits where Schussler et al., (2014) found that if leaders were unable to manage paradox these summits could fail and serve as a mechanism of field maintenance rather than as catalysts for change.

In addition, management scholarship has mostly been fixated on the role of corporate players in enabling sustainable development, again focusing on the organization or mesa level as opposed to understanding how the micro level facilitates sustainable development (Bode et al., 2019; Wright & Nyberg, 2017). A continued disregard for microlevel analysis, and cross-level analysis will result in the continued failure to present the multilevel understanding needed to solve grand challenges. Still, the lack of research studies which focus on microlevel analysis is not the only gap in this field of research. The editors from the AMD special edition also pointed out that management scholarship has a western bias and that there is an opportunity to make further progress on the SDG's by having a global focus where research is not limited by geographical reach (Howard-Grenville et al., 2019). Therefore, this study advances the Sustainable development discourse in several areas.

Addressing a Practical Problem

Although innovation has earned the reputation of being the best medium for sustainable development. Numerous scholars have noted that despite international efforts, innovations are failing to resolve grand challenges and bring humanity closer to realizing the Sustainable development Goals (Griggs et al., 2013; Lomborg, 2004; Whiteman et al., 2013). Boons et al., (2012) argue that although sustainable innovation is creating new global markets and transforming challenges into business opportunities, SD requires radical and systemic innovations which move beyond normal incremental adjustments that are merely product and process related. Similarly, Voegtlin & Scherer (2017) contend that firm-level innovations are not yet responsibly developed to facilitate SD and that it is necessary to create responsible innovations that specifically address the Sustainable development Goals (SDGs). While, in a discussion on social innovation and grand challenges, Wijk et al., (2019) posit that shallow benign business interventions often maintain existing power structures which can reinforce wicked problems instead of bringing sustainable transformation.

Nonetheless, despite the challenges and shortcomings numerous organization face in tackling sustainable development, the UNEP YCE have successfully created innovations that are well aligned with the goals of genuine SD. Without question, they are a perfect example of how individual actors play important roles in the attainment of the SDGs. The United Nations Environmental Program (UNEP) has recognized these exemplary young leaders for their pioneering environmental and social efforts and has presented them with the Young Champions of the Earth (YCE) award. The UNEP YCE program began in 2017 with the goal of honoring young change-makers with big, bold ideas for the environment and humanity. Each year this award is presented to seven persons between the ages of 18 to 30, from each global region: one

from Africa, Europe, Latin America and the Caribbean, North America, the Pacific, and two from Asia. The UNEP YCE have innovated in the areas of clean energy, ecosystem restoration, water security, agriculture, sustainable clothing, and conscious consumption among others. Apart from the UNEP YCE very few organizations and individuals have been able to create innovations that solve Grand Challenges and move the needle on the Sustainable Development Goals.

Methodology

The primary purpose of this study was to explore the phenomenon of sustainable innovation so to develop a theory which explains how and why individuals create sustainable innovations for a flourishing world. Grounded theory, an inductive, qualitative methodology was utilized for this exploratory study. The grounded theory methodology was first espoused in 1967 by Barney Glaser and Anselm Strauss in their book, *The Discovery of Grounded Theory: Strategies for Qualitative Research* (Glaser & Strauss, 1967). According to these scholars, new theories result from an ongoing interpretive process of constant comparison where data are collected and analyzed simultaneously (Suddaby, 2006). In grounded theory instead of testing preconceived theories the main interest is in abstracting the information gathered on the social situation under examination into theoretical statements (Suddaby, 2006). Hence, data analysis proceeds systematically from open, axial and selective coding (Corbin & Strauss, 2015). Furthermore, data analysis also includes theoretical integration, and openness to creative interpretations necessary for theory development (Charmaz, 2008). According to Bansal (2019) considering that historical data is becoming “increasingly unreliable in predicting the future, inductive and abductive research can offer more insight than hypothesis-driven research”. In light of the above quote this study makes a contribution that is both relevant and rigorous.

Participants

Fifteen winners of the UNEP’s Young Champions of the Earth award were asked to participate in the present study. From this group, six persons under the age of thirty-one participated in the study. The participants were located in a variety of geographical regions globally, Nepal, Greece, Brazil, Ireland, California, and Kuwait. The criterion for participation in the study was (1) winning the YCE award and (2) for the participants to still be working towards the goal of sustainable development through the original innovation at the time that the study was conducted. In Table 1 below, these participants are described in terms of the age when they won the award, education level, location, and the SDG’s that their innovations addressed.

Table 1: Showing Participant Characteristics

Participant (PT)	Gender	Age	Location	Education (Degree)	SDGs Addressed
PT1	Female	21	Latin America	Bachelors	Goal number 6; Clean Water and Sanitation

					Goal number 8; Decent Work and Economic Growth
PT2	Male	25	Europe	Masters	Goal number 12; Responsible Consumption and Production Goal number 13; Climate Action Goal number 15; Life on Land Goal number 17; Partnerships for the Goals
PT3	Female	30	Asia	Bachelors	Goal number 5; Gender Equality Goal number 8; Decent Work and Economic Growth Goal number 13; Climate Action
PT4	Female	30	Middle East	Bachelors	Goal number 4; Quality Education Goal number 5; Gender Equality Goal number 13; Climate Action
PT5	Male	27	North America	Bachelors	Goal number 13; Climate Action Goal number 14; Life Below Water Goal number 17; Partnerships for the Goals
PT6	Male	26	Europe	Bachelors	Goal number 13; Climate Action Goal number 14; Life Below Water Goal number 17; Partnerships for the Goals

Procedure

The participants were first contacted by a brief invitation message on LinkedIn, a professional networking website. Those who agreed to participate were then sent an emailed letter describing the research goals and methods of data collection. This letter included an ethics statement and consent forms for their participation and for video recording. Closer to the interview date a second email was sent describing the interview process. The interviews were conducted on Zoom, an online platform for video conferences and lasted for about 45 – 75 minutes. Each interview was recorded, saved, and transcribed for analysis using Trint software. Participants were sent a copy of their transcribed interviews at the commencement of data analysis so that they could edit or expand the information. A follow up interview proceeded based on the participants availability.

Instruments

The primary instrument was an in-depth interview guide. This interview guide included questions specific to the research questions and to sustainable innovation. These questions were refined

through a pilot study where one of the UNEP YCE award winners was interviewed to assess the fit and meaningfulness of the questions. The initial interview guide included the following areas: views and attitudes about sustainability, life experiences, life purpose, support systems, and coping practices. After the first interview, the initial questions evolved to better generate answers that were more closely connected to the research questions. Consistent with the goals of qualitative research the participants were encouraged to describe their experiences in their own words and from their own viewpoints. The primary interview questions avoided using constructs which had the potential of leading the participant towards a particular response, however, the secondary or probing questions were less structured, more organic, and, in some cases, included theoretical terms to explore emerging concepts. In grounded theory data collection serves as the primary means for theoretical sampling and so the objective was to ensure the interview questions generated data that facilitated the process of category development. The UNEP YCE award winners were an interesting sample of research participants who had been interviewed many times before in different settings and so in terms of data collection, hence, there was a lot of archival data from videos and documents available to analyze and deepen my investigation on each of the participants even more.

The Researcher as an Instrument

“Grounded theory is an interpretive process that depends upon the sensitivity of a researcher to tacit elements of the data or meanings and connotations that may not be apparent from a mere superficial reading of denotative content” (Suddaby, 2006, p. 639). In this study I functioned as an instrument as I performed the function of an interviewer as well as an interpreter or the lens through which the data was read and analyzed. When analyzing the data, it is expected that my own subjective interpretation, awareness, sensitivity to the participants words, tone of voice and facial expressions influenced how I interpreted the data collected. Nevertheless, the term “theoretical sensitivity” which is commonly used in grounded theory highlights the importance of the researchers’ awareness and interpretive insight. After reflecting on how the data was collected and analyzed and reviewing the findings, I believe my role in this process was positive and successful. Table 3 below displays the interview questions and how they pair with the research questions.

Data Analysis

“Analysis begins after the first data are collected. Data collection is followed by analysis. Analysis leads to concepts. Concepts generate questions. Questions lead to more data collection so that the researcher can learn more about those concepts. This circular process continues until the researcher reaches the point of saturation” (Corbin & Strauss, 2015, p. 135).

In grounded theory research there is a circular movement between data collection and analysis, and this is the process that was utilized for this study. Hence rather than collecting all the data at once (which is done in other forms of qualitative research) the interview data was first analyzed using open and axial coding before continuing to another interview. By the third interview I had

already begun developing subcategories and categories that the other cases would later confirm. Table 2 below displays the interview questions and how they pair with the research questions.

Table 2: Interview Matrix Showing Interview Questions and Research Questions

Main Research Question	Interview Question
Why do the UNEP Young Champions of the earth create innovations for sustainable development, are there internal dynamics that drive them to create sustainable innovations?	What led you to this type of work, towards sustainable innovation and sustainable leadership? Can you recall a particular experience that may have propelled you into this direction?
	What about your current role being both a leader and an innovator in your organization, is the most meaningful and energizing part of this experience for you?
	Imagine yourself twenty-five years from now, imagine that all of your plans and your highest visions for your organization has come to past and exceeded your expectations. What kind of legacy do you think you would have created?
	what has been one of the most important things that you have learned about yourself from this experience of being a UNEP YCE?
How are the UNEP YCE able to create innovations that are aligned with the goals of sustainable development?	Can you reflect on a situation when you first recognized your potential to create change?
	Could you please describe how your organization contributes to sustainable development from an environmental, social and economic perspective?
	What would you say is the root cause of your success?
	What elements have supported you on this journey? Is there any particular time throughout this journey that you felt that you were supported by something bigger than yourself or beyond yourself?
Are there any life experiences which may have encouraged the UNEP YCE to pursue a career in sustainability and to do	Considering the collective impact that you and all of the winners have had on the world, if you could create some sort of curriculum that would build the essential strengths or behaviors needed to create similar innovations, what courses would you include?
	It is often said that “the whole is more than the sum of its parts”, are you able to recall any experience? when this was relevant to your situation?

meaningful work?	
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Open Coding

During open coding, each interview was initially coded by employing an ‘open’ approach to the data where the data was coded with fresh eyes that welcomed the discovery of new insights. “The process of open coding is exploratory and leads to concept identification” (Corbin & Straus, 1998 p. 87). The objective was to utilize an inductive approach and focus attention to every line and each word expressed by the participants. Open coding was done in two and in some cases three rounds of coding. During the first round of open coding hard copies of the transcripts were read to select and underline in-vivo codes, key quotations of the participants which amplified the essence of their narrative while speaking directly to the research goals (Saldana, 2016). The second round of open coding employed a more systemic approach to open coding which created descriptive codes using the “what is the main idea being expressed here?” technique (Corbin & Strauss, 2015 p. 218). Process codes were also created by asking the question “what is happening here” and considering “what is the action being taken, who is doing it? When? Where? How? Why?” (Corbin & Strauss, 2015, p. 219). Approximately 350 open codes were generated after open coding all the interviews.

As part of the grounded theory methodology used to analyze the data collected for this study open codes were placed into groups. These groups were formed and reformed continuously, before, during and after the axial coding process.

Table 3: Table Showing Some Raw Data and Corresponding Open Codes for Interview Question 1

Interview Question: What led you to this work (towards sustainable innovation)?	
Raw Data (participant’s quote)	Open Codes Generated
<p>“One of the experiences definitely that helped lead me towards working in the environmental field was an experience I had when I was about 16 years old. I was able to go and live with an indigenous community in the deep rainforest in Mexico and I spent a week living in this community that was descended from Mayans and really experienced that way of life that’s so deeply connected with a rainforest and the environment around them. Well, also seeing how that way of life was threatened by the encroachment of kind of the Western world in a number of different ways, including deforestation and cattle farming and so as a teenager, I definitely already knew that I</p>	<p>Process codes: ‘Awakening to one’s life purpose’, ‘Experiential learning’, ‘Choosing a green careers’ ‘witnessing the challenge’</p> <p>Descriptive codes: ‘Imprints of early years’ ‘Devoted environmental activist’</p> <p>In-vivo codes:</p>

<p>wanted to devote my life towards doing something positive for the environmental movement.” PT 5</p>	<p>“I wanted to devote my life towards doing something positive for the environmental movement”</p>
<p>“when I was growing, and I saw that it wasn’t a reality for more families that was around me my friends my colleagues. I saw that they needed to do this! I needed to do something so more people could act and do things for the environment” PT 1</p>	<p>Process code: ‘Witnessing the challenge’ ‘Feeling empathy’</p> <p>Descriptive code: ‘Imprints of early years’ ‘Aware of personal Power’ ‘Passionate environmental activist’</p> <p>In-vivo code “I needed to do something”</p>

Constant Comparison

As the research study proceeded new data and open codes were constantly compared to prior data. This ensured that similarly defined codes were grouped together and if the meanings were not distinctive enough those codes were replaced with more representative concepts.

The constant comparison technique between and within interviews was employed in an effort to refine early open codes, improve their representativeness and create code groups with codes sharing a similar meaning (Corbin & Strauss, 2015). In some cases, during the open coding process descriptive and analytical memos were created simultaneously.

Axial Coding

In this research study, Axial Coding followed after the open coding process and employed methods of process thinking (Langley, 2007) and process research (Langley et al., 2013; Langley, 1999). Process research focuses on how and why things emerge or develop over time as it places close attention on the individual interpretation of experiences and the narratives which shed light on these experiences. Hence it reveals the dynamic activity underlying the phenomenon, thus transcending the linear, static analysis of outcomes (Langley et al., 2013). Understanding process is significant for advancing management research as it offers the opportunity to understand emergence, change, stability, and causality (Langley, 1999; Howard-Grenville et al., 2019).

Here, I focused on process codes that captured critical aspects of the participants, and causal relationships between actors and events, this facilitated a more formal coding process that condensed the initial code list (Howard-Grenville et al., 2013). Emerging ideas were compared

with constructs in extant literature in the related field for cross-checking purposes and to reinforce the emerging concepts (Strauss, 1987).

When researchers are coding for context, they are doing what Strauss (1987) called “axial coding”. They are locating and linking action-interaction within a framework of sub-concepts that give meaning and enable it to explain what interactions are occurring, and why and what consequences real or anticipated are happening because of action interaction. (Corbin and Strauss, 2015, p. 156)

Three tools recommended by grounded theory scholars Corbin and Strauss (2015) to perform axial coding and reveal process and context were also used; the paradigm, the conditional/consequential matrix, and memos. In addition to these analytical tools, diagrams or visual maps of processes were constructed with paper and pencil to organize and theoretically frame the data (Langley, 1999; Corbin & Strauss, 2015).

Selective Coding

This was another complex and multifaceted part of the data analysis process. During the early stages of data analysis, my focus was centered more on the specific details and concepts that were emerging and how they were related to each other. I remained close to the methodological and systemic approach of Corbin and Strauss (2015) and continually asked ‘what is this data telling me overall?’. However, further into the process, during selective coding, I took a more creative and holistic approach encouraged by Glaser. This shifted my focus directly on answering the research question – why and how the UNEP YCE create high-impact innovations for sustainable development. It included paying attention to my intuition, interpretations, and creative insights.

It was also appropriate to step outside of the data and eliminate initial categories which were less abstract and add new ones which were more appropriate in the context of a core category. According to Corbin and Strauss (2015), a core category is the central category of the research. It has the greatest explanatory power and is able to link the other categories to it and to each other, therefore it represents the main theme of the research. In addition, it is a concept that is “sufficiently broad and abstract, that summarizes in a few words the main ideas expressed in the study” (p.188-189). Hence the final four core categories Entangling, Enlightening, Enacting, and Evolving which are explained in the findings sections, are abstract and broad while being somewhat descriptive.

Data Collection & Analysis Demonstration

In this section, a small glimpse into the process of data collection and analysis is provided.

Research Question

Why do the UNEP YCE create high-impact innovations for Sustainable development?

Interview Question

I want to understand what led you to this work, could you describe or explain how you were propelled into this direction?

Participant Quote

“There are a couple of key moments starting in 2010 when I was in secondary school, I was looking to go off with a group of classmates to work in Calcutta, in India for a short period of time, it was designed as like a volunteer kind of trip. I was teaching English and math to teach children in a school that was located in the middle of one of the city's dumps and I mean, the teachers design it for us was like a wake-up, you know, there's a bigger world outside of the nicer little Western bubble where there is a lot of things that you're not gonna be comfortable with and you really need to understand and try and make a difference during your life. So that was a pretty shaking experience. I was 17 at the time and obviously, I absolutely love it, but it really makes you question a lot of things. And I suppose from that point on, I was definitely like, well, what's the point in doing anything at all if you're not trying to make a difference? So, it wasn't so much although I was interested in climate and that kind of thing at that point, it was more a knowledge that I had spent my time doing something to make the world a better place at that stage.” PT 2

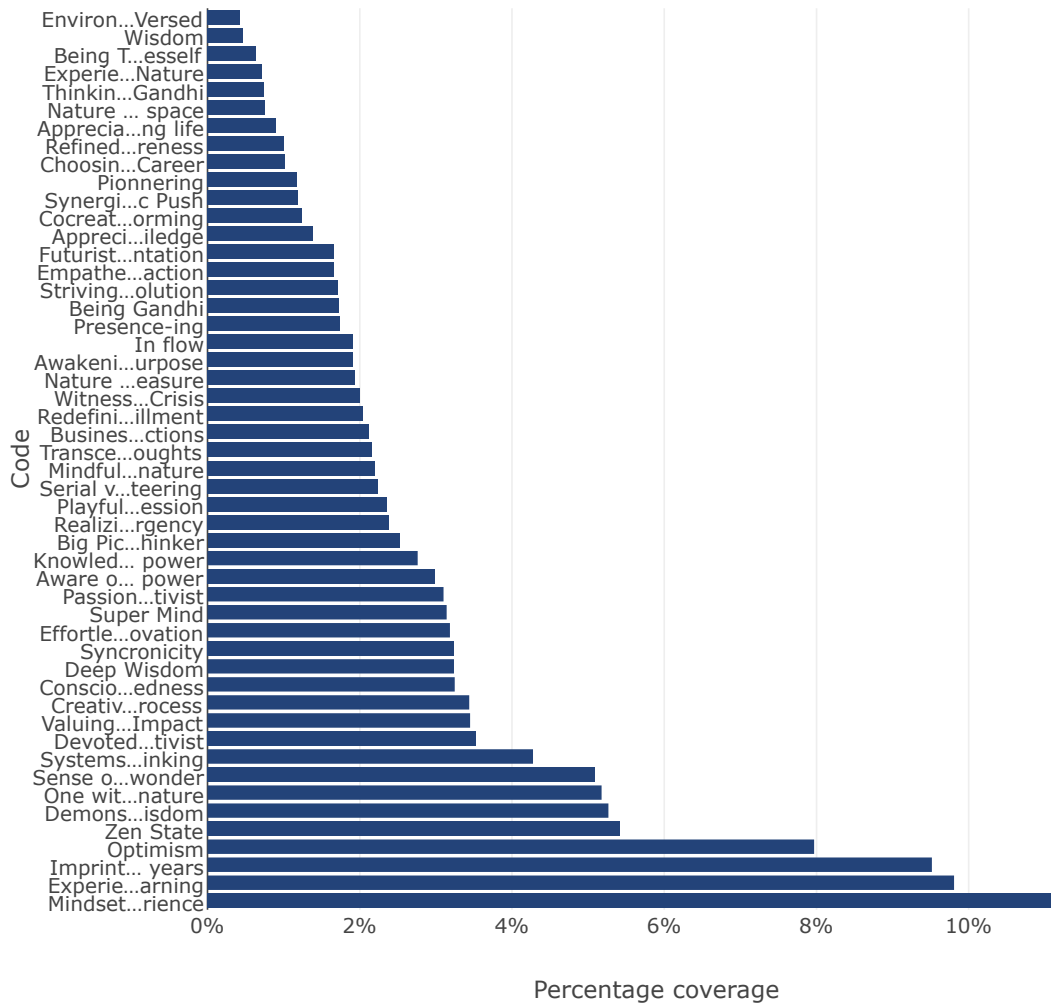
Open Coding:

- In vivo codes: “wake up”, “what's the point in doing anything at all if you're not trying to make a difference?” “pretty shaking experience”
- Process codes: witnessing a challenging reality, questioning the purpose of life, awakening to one's life purpose, choosing a social career.
- Descriptive Codes: Mindset shifting experience, Experiential learning, Aware of one's power.

Memo

Here he is describing a key moment in a slum in India that led him towards sustainable innovation. He describes it as a shaking experience, a wake-up experience where he gained a broader more truthful perspective of the reality of life. These words describe the intensity of the experience. There are a few process codes; witnessing a challenging reality, questioning life, awakening to one's life purpose, choosing to work towards making the world a better place. This quote also includes knowing that he has the power to change or influence on the world – Knowing one's power of influence. When he mentions what's the point, we see the intensity of his level of commitment. He mentions that it is a short trip but it is a teaching assignment and so we might assume that this experience is of a short to medium duration.

Figure 2: Code Percentage Diagram, PT 5



Theoretical Saturation

According to Glaser and Strauss (1967) the signals of theoretical saturation include repetition of information and confirmation of existing categories. Hence in grounded theory the focus is on the data and how it aligns with, develops and confirms the categories as opposed to the number of subjects participating in the study. This element makes grounded theory different compared to other methods of qualitative research. In conducting data analysis, I focused on sampling for relevant codes and developing them into a theory that answered the research questions and illuminated the phenomenon. I began my first interview with several questions that my main research advisor and I thought would lead to answering “why” and “how” the participants created sustainable innovations, these questions evolved as my process involved using the data to generate more effective and appropriate questions and using questions to generate more relevant data. Hence, during data analysis, I identified and focused on the questions that supplied the most

relevant answers to the research questions. This facilitated the process of developing categories, core categories, the theory itself and reaching saturation. According to Corbin and Strauss (2015, p. 135) “In theoretical sampling it is concepts and not people per se, that are sampled”.

In addition, in grounded theory the categories should be explored in depth to identify various properties and dimensions. This implies not only that upon completion of data analysis no new categories or relevant themes are emerging but also that the theory is dense and logical.

Identifying properties and their various dimensions enabled me to develop the categories completely and reach theoretical saturation. This was paired with a creative lens focused on category development. In addition, in developing the theory, I took a step back from considering the systematically derived subcategories and categories and allowed my subjective interpretations and insights to merge with the empirical context of the study (subject area) and develop the final theory. According to Glaser Corbin & Strauss (2015) “Theoretical sampling continues until all categories are saturated – that is until all relevant properties and dimensions have been identified and there is variation built into the theory” (p. 147).

Steps for Validity

Traditionally research findings are only deemed rigorous when they conform to the “specific practices of knowledge production widely accepted in the academic community” (Sharma & Bansal, 2020; Van de Van 2007). For example, in the positivist tradition, it is construct validity, internal validity, external validity, and reliability that is used to access rigor (Campbell, 1979). However, according to Maxwell (2013), it is the depth of the phenomenon studied and triangulation from other studies which provide credibility and establish validity in qualitative research (Maxwell, 2013). In addition, unlike quantitative studies that test hypotheses on sizeable populations, the value of a qualitative study typically depends upon its ability to illuminate extreme or ideal cases (Maxwell, 1994). Furthermore, grounded theory is a qualitative method that stays close to the raw data and is therefore high in accuracy. Hence, when this method of inquiry is coupled with a cross-case analysis of four or more cases it provides a good basis for analytical generalization- expanding and generalizing theories (Eisenhardt, 1989; Yin, 2009).

Primarily, validity in grounded theory relies on the proper execution of the grounded theory method itself. Hence ensuring that the theory was grounded in the data through the systematic process of data collection and analysis was the most important consideration in this study. In addition, several steps were taken to strengthen the validity of this analysis. First, internal validity was established during the data analysis phase through constant comparison of the data within and between interviews and theoretical or concept sampling was executed. According to (Strauss & Corbin, 1998 p. 200) “a theory is validated by comparing it to raw data or by presenting it to respondents for their reaction”. In addition, validation of the data was achieved through peer checks and member checks. The findings were discussed with some of the participants, for their feedback and confirmation, and the data analysis process was verified with external persons - other Ph.D. researchers in the department of management at my university and members of my

dissertation committee, particularly my main research advisor who has decades of experience with this research method.

The data was triangulated with prior findings or theories from similar streams of research (Yin, 2010) and at the end of data analysis, the theory was reviewed to ensure that it was grounded in the data. Furthermore, triangulation of the interview data with archival data also enhanced validity. Although grounded theory does not focus on external validity as in other qualitative research methods or quantitative research, the following section explains how external validity is addressed in this study.

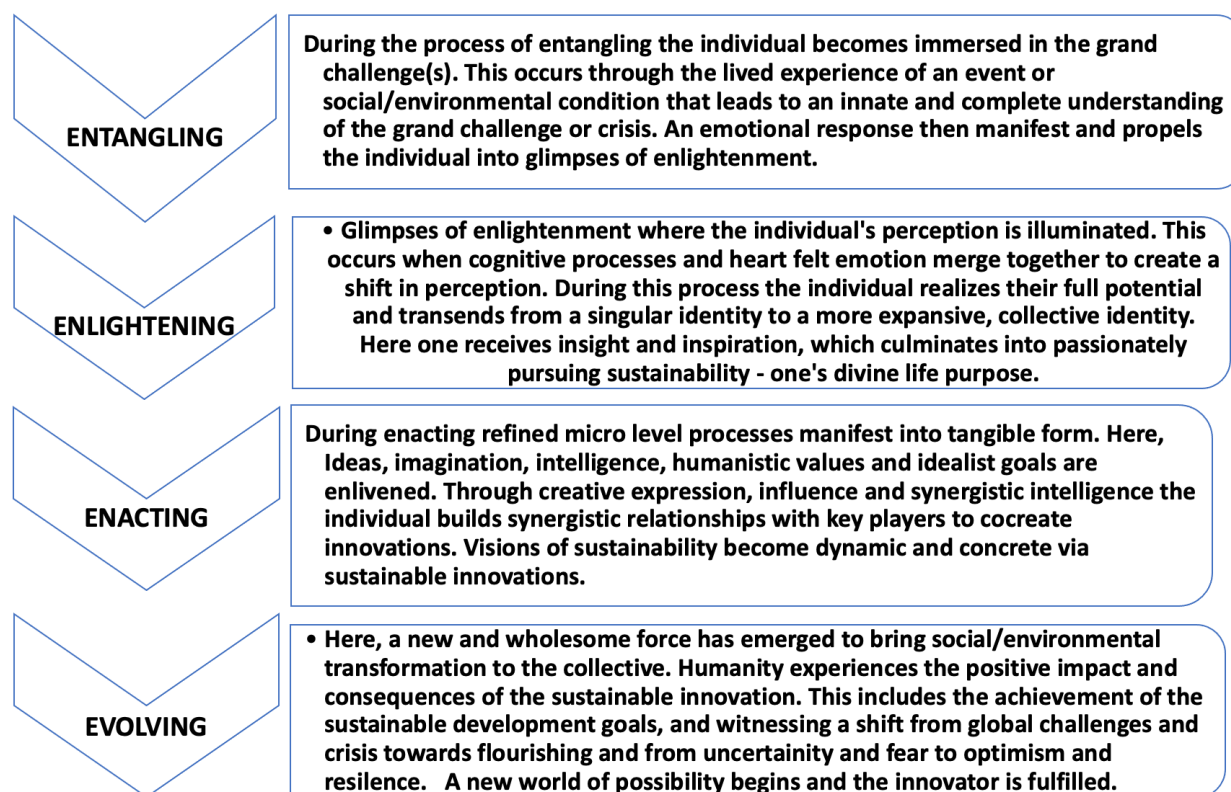
According to Maxwell (2013, p. 138), “The generalizability of qualitative studies is usually based not on explicit sampling of some defined population to which the results can be extended, but on the development of a theory of the process operating in the case studied, ones that may well operate in other cases, but that may produce different outcomes in different circumstances.” In research studies involving multiple case studies external validity can be achieved by using replication logic (Yin 2015). Here, a sound theory has been presented that enables the findings to be generalized to similar situations as subsequent cases were used to validate the findings discovered in prior cases. Furthermore, Yin (2015), also rationalized that “augmenting the study design with how and why research questions can be extremely helpful in establishing the groundwork to address external validity” (p. 46). In this study the primary research question was “Why and How the UNEP YCE create innovations for sustainable development”, this speaks directly to Yin’s recommendations. Furthermore, reliability was established through the transparency of the study methods and data analysis, which can be replicated to achieve similar results (Gibbert et al., 2008).

This section described, defined, and illustrated the methods used to conduct this research study. It described the participants, instruments, procedure, method of data collection and demonstrated how the grounded theory methodology was utilized to analyze the data collected. The grounded theory method is a meticulous process that includes many memos, outputs and diagrams from the coding software which exceeded the scope of this summary paper, however, I attempted to include some material to demonstrate the integrity of the process. The following section presents the results or findings of the study, it provides a deeper look into the final four categories and discusses how each category integrates with the other.

Findings

The data from this research revealed a 4 E Process Model where lived experiences orchestrated by grand challenges at the macro level trigger micro-level processes within the individual enable mesa level interactions which facilitate the development of sustainable innovations. These four processes were named: Entangling, Enlightening, Enacting, and Evolving.

Figure 3: 4 E Process Model



Entangling

In this 4 E process model, high impact sustainable innovations are first birthed through Entangling. Entangling is a process composed of two significant stages, immersion, and epiphany. Immersion occurs through the lived experience of an event or social/environmental condition at the macro level. This leads to an innate and complete understanding of the grand challenge or crisis. Entangling is the first and arguably the most critical phase in the model as it is the catalyst for the other three phases.

During immersion, the experience of critical social and environmental challenges is such a direct one that the perception or interpretation, and subsequent emotion generated from these critical events and experiences creates an epiphany, a mental response which drives the momentum for enlightening the next processes in the model. Hence, that the lived or direct experience of the individual extends beyond just seeing or witnessing the challenge. This lived experience is a more dynamic process that impacts both perception and emotion, two micro level processes that facilitate the resulting epiphany and completes the Entangling process. Therefore, Immersion involves two key processes:

- The experience of the macrolevel challenge.

- Perception and emotion, at the microlevel.

Perception as defined here describes the process of seeing and primes one for an emotional response. Perception was an appropriate bridge between physically witnessing the crisis through lived experience and then feeling emotion because it is this seeing and interpreting what one has seen that subsequently evokes the emotion. Emotion is another key part of this process. In this study, the emotions expressed by the participants not only gave insight into the level of intensity of the experience but also illustrate the micro-level process which facilitates action. Emotion is crucial to the model as it articulates the human condition of which feeling, and sensitivity are a central part. Following emotion, one returns to the mental plane where an epiphany occurs. The epiphany can be described as a moment where love meets logic; it moves the individual into an even deeper internal experience that grows during Enlightening, the next phase in the model.

How Raw Data Ground the Core Category Entangling

The following Table reports how the core category – Entangling was realized. The table shows the core categories, categories, code groups, open codes, and a significant quote in that category. The full paper includes such a table for each core category.

Table 4: Quotes, Codes, and Categories for the Core Category Entangling

Core Category	Category	Code Groups	Open Codes	Most Significant Quotes
Entangling	Immersion	Experiential Learning Immersion	Internalizing the Challenge Witnessing the challenge Imprints of Early years Conscious of the present moment Tuning in Presence-ing Transcending thoughts	“When I was in high school, I got the chance to go and work in Calcutta, in India... So that was a pretty shaking experience, I was 17 at the time... it really makes you question a lot of things” PT 2.
	Epiphany	Mindset Shifting Experience	Realizing the urgency of Grand Challenges Mindset Shifting Experience Shifting mental models Emotional Triggers Pain Points Wake Up	“To be honest the first time I saw a truck full of plastic that we took from the sea I almost cried” PT5.

		Awakening to one's life purpose	Awakening to one's life purpose Reevaluating priorities Redefining Happiness Redefining Fulfillment Realizing truth-awakening Purposefully convinced Choosing green careers Led by Conviction	
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Enlightening

Enlightening is the second stage in the process model. It can be described as glimpses of enlightenment where the individual's awareness is illuminated. In Enlightening one receives insight and inspiration, and feels power, love and connectivity. This culminates into the drive to passionately pursue idealistic goals that save the planet and empower humanity. Enlightening can be described as a process of self-realization where cognitive processes and heart felt emotion merge together to create a shift in how one interprets the self and the outside world.

Self-Realization, as defined in my coding process is an understanding of one's true nature, one's full potential and one's place in the circle of life. It enables the highest expression of humanity to be expressed through someone's life through love and empathetic dynamism. Self-Realization is central to the Enlightening process, it includes power awareness and amplified identity. Power awareness denotes that the individual realizes their potential and intention to solve grand challenges. In addition, amplified identity denotes how during Enlightening the individuals' sense of identity becomes amplified. Meaning that one experiences feelings of love, connection and compassion and transcends from a singular identity to a more expansive, collective identity. Power awareness and amplified identity operate in unison to position the individual on a path that is recognized as one's divine life purpose. This path becomes concrete in the next phase of the 4 E Model, Enacting.

Enacting

The third phase in the 4 E process model is the Enacting phase. Sustainable innovations become concrete and tangible during the Enacting phase. Enacting is a process where refined micro level processes manifest into tangible form at the mesa level. It is an instrumental part of the 4 E process which functions as a portal that transmutes internal intelligences into external innovation. Whereas Entangling and Enlightening answer the "Why" of the research question, Enacting answers the "How".

This phase is composed of two processes that I refer to as Super Brain and Synergy. The concept of super brain denotes brain functioning at an optimum level of performance where thinking is

holistic, creative and dynamic. A super brain produces evolutionary ideas due to a high level of imagination, creativity, brainstorming and systems thinking. It is an active, energetic and exploratory brain. In addition, the thoughts produced are layered with humanistic values and idealist goals previously evoked during the Enlightening phase. A significant part of Super Brain is synergistic intelligence, the ability to think holistically and at a systems level. Here it is referred to as an intelligence because it resembles a trait that the individual possesses that is instrumental in enabling visions of sustainability to become dynamic and concrete. The micro level processes described above coupled with previous qualities in the Enlightening phase lead to Synergy.

Synergy, the second category in this core category represents the 'how' of creating high impact innovations, how the individual influences and collaborates in sync with others to construct the sustainable innovation. Synergy occurs at the group or mesa level where one effects change by enlivening others to participate, act and invest. It includes the ability to inspire, unify, and move others into collaborative action. Hence, synergistic intelligence described in Super Brain serves as a critical tool which the innovator uses to create synergy. This building of synergy with key players is essential to creating high impact innovations for a flourishing world.

Evolving

During Evolving, a new and wholesome force has emerged to bring social/environmental transformation to the collective. Here, both the planet and humanity experience the positive impact and consequences of the sustainable innovation. This includes the achievement of the sustainable development goals, witnessing a shift from global challenges, fear, uncertainty and crisis towards flourishing, optimism, and resilience. Here a new world of possibility begins to unravel, and the innovator is fulfilled. Two subcategories distinguish this process, Continuous Sustainable Innovation and Flourishing. Continuous Sustainable Innovation describes a process of constantly innovating, enhancing and refining the innovation or model so that it provides the maximum benefit to both the environment and the people. For example, one participant said "right now we are in the version number 11 so it has been a long journey trying to make the product even better, and we are still making more optimizations to make sure that it's really change people's life" Flourishing describes a planet where balance and wholeness has been restored. A flourishing world is one where the planetary systems function harmoniously and fairly. Here all life forms experience the fullness of life and the future looks of the planet looks promising. For example, one participant said, "it's like the butterfly effect, the actions of a person can change the lives of so many other people, the townspeople and the rest of the world."

Limitations

As with all studies, this study has a few limitations. First, six ideal cases of sustainable innovation were used to develop the theory. In each case study analysis, the innovator was actively and successfully pursuing sustainable innovation. Although this provided an excellent opportunity to explore why and how the participants created innovations for sustainable development, in restricting the study to these high-performing individuals it may have limited the generalizability

of the findings. Exploring cases of sustainable innovation which were not successful may provide more clarity on the phenomenon.

Second, although efforts were made to execute a multi-level study, in comparison to the analysis at the macro and micro levels, mesa level interactions were not as thoroughly assessed. My focus limited exploration of how the innovator and his/her teams worked on building and financing innovations. Hence further exploration of the actions which take place at the mesa level is needed. In addition, the data did not include observations or interviews with others but relied on self-report and some archival videos and documents. The 4 E process model taken by innovators to create innovations does answer the question of how the UNEP YCE create sustainable innovations by describing how the innovators think, interact and behave. However, more in-depth case studies could examine the step-by-step actions taken to create the innovations.

Finally, a stronger focus on temporal dimensions of the participants such as childhood history would offer further clarity into the why of the research question. Although the interview process did a good job in gathering such data, for example, some of the text was coded as “imprints of early years” and “childhood experiences”, a more deliberate focus into the participants' history may be insightful. My theorizing draws attention to the strengths of grounded theory analysis as a method of process research for understanding sustainable innovation. However, future research that can measure emotions and cognition will be beneficial. In terms of exploring emotions, a more fine-tuned analysis that explores and quantifies the total number of impactful lived experiences, as well as their intensity, will deepen the experiential focus of the research and leverage opportunities for macro-level research.

Value of the Paper

This research impacts practice and extends existing theory in several ways. It advances a broader understanding of sustainable development and sustainable innovation and contributes to the literature on process research, emotion, and entrepreneurship, and has implications for learning and education.

Sustainable Development

This study answers the call for more multilevel and microlevel analysis of the sustainable development phenomenon (Bansal, 2019). In many cases research on sustainable development has been centered on a single level, particularly the organizational or mesa level, however, it is becoming clear that it is individuals who form the foundation of organizations and social systems and are therefore the most fundamental. This study provides a richer and more profound understanding of micro-level processes and broadens the generalizability of micro-level research. Sarasvathy and Ramesh (2019) present a model focused on micro-level processes for entrepreneurs to tackle sustainability issues while offering a theoretical framework for researchers to develop and investigate micro-foundations. Their work reanalyzes a historical case study (Ostrom, 2010; 2015). This research study has advanced their efforts. It has gone beyond archival

data and analyzed data collected from multiple live interviews which permitted more fine-grained micro-level analysis.

In addition, analyzing the outcomes of each of the sustainable innovations and enterprises created by the UNEP YCE according to their response to the SDGs has illuminated their achievements and macro-level impact in the context of the Sustainable Development Goals. Furthermore, my investigations into the macro-level conditions and events which triggered the internal reactions at the individual level and the subsequent team level interactions employed for these innovations to be birthed also demonstrate my emphasis on multi-level research. As stated by the editors of a special issue of the *Academy of Management Discoveries*, multiple levels of analysis are “crucial for understanding progress on and roadblocks to the SDGs, which implicate actions at the individual, group, organizational, sector, and institutional levels and manifest at the local, regional, national and global scales” (Howard-Grenville et al., 2019, p. 355). Furthermore, unlike prior studies of innovation for sustainable development which have been limited to subjects from a single geographic region and which have a western bias, this study acknowledges that the SDGs compel a global focus and responds to the invitation to broaden the generalizability of sustainability research (Howard-Grenville et al., 2019). It transcends the Western domain and investigates cases in various global settings; North America, Asia, Europe and the Caribbean, to give more holistic insight on how grand challenges are being tackled globally.

Process Research

Second, my analysis contributes to the growing body of process research (Langley, 2007). Process studies question how and why things emerge or develop over time to reveal the dynamic activity underlying the phenomenon, thus transcending the linear, static analysis of outcomes (Langley et al., 2013). Most prior studies on sustainable innovation have focused primarily on action and overlooked the critical internal micro-level processes which form the basis for such sustainable action. However, as specified by Langley et al., (2013) understanding process is significant for advancing management research as it offers the opportunity to understand emergence, change, stability, and causality. Similarly, sustainability scholars have highlighted the value of conceptual tools that contribute to “how meanings, actions, and arrangements are constructed, perpetuated and changed” (Howard-Grenville et al., 2019, p. 356). My investigations of why and how the UNEP YCE create sustainable innovations answers this ongoing call to plunge more deeply into process (Langley, 1999; Howard-Grenville et al., 2019) as it places close attention on the individual interpretation of experiences, and the narratives which shed light on perception, emotion, and cognition. Each of the four stages of the 4 E model uncovers the conditions, thoughts, feelings, and interactions, that move the innovator through Entangling, Enlightening, Enacting and Evolving.

Emotion and Entrepreneurship Research

Third, the articulation of the phases in the 4 E model clarifies a critical debate within the entrepreneurship and innovation literature. There have been inconsistencies about the role of emotion and affect in facilitating innovation. One side of scholars have described such concepts

as poorly distinguished concepts (Arend, 2013) while others have shown that feeling and emotion serves as a motivator for entrepreneurship and prosocial behavior (Bacq & Alt, 2018; Baron, 2008; Miller et al., 2012). My theorizing is consistent with Baron (2008) who suggests that affect may be a mediator between individual-level and macro-level variables and also with Miller et al., (2012) whose theory sheds light on how other oriented compassion is transformed into social entrepreneurship by means of flexible thought processes and greater commitment to action. In addition, Howard-Grenville et al., (2013) argued that experiences and emotional involvement can shape identity understandings and collective action. The 4 E process model supports this logic as it illustrates how a two-way process between cognition and emotion facilitates sustainable innovation. Hence, this research advances the understanding of experience and emotion as drivers of processes for sustainable entrepreneurship and innovation (Howard-Grenville et al., 2013). Consequently, it has implications for further study, it suggests that further exploration of how experience, emotions and cognition function to enable pro-social and environmental decision making is needed.

Implications for Learning and Education

A key contribution of this dissertation is to the field of education, specifically sustainability education and management education (Kassel & Rimanoczy, 2018; Cook, 2019). The scholars in *Developing a Sustainable Mindset for Management Education* (Kassel & Rimanoczy, 2018) have presented experiential learning as a method for teaching entrepreneurship with a sustainable mindset. They also propose active learning and field experiential learning in developing countries as tools to guide students into sustainable leadership and innovation. The findings in this study also suggests that experiences or experiential learning can accelerate progress towards a flourishing world. Therefore, including real world, experiential and emotion-generating exercises and simulations should enhance the learning journey and cultivate students' capacity to create sustainable impact.

Similarly, scholars in *Sustainability Human Wellbeing and the Future of Education* (Cook, 2019) also discuss the benefits of transformative learning (Laininen, 2019, p. 168). There, transformative learning is said to “open up one’s frame of reference, allows seeing alternatives and changes thoughts and actions”. The implications of the present study align with the concept of transformative learning described as a deeper level of learning through experiences which can allow moments of epiphany and inspiration (Schutel et al., 2018; Sterling, 2011). Shifting the education paradigm towards experiential and transformative learning where students can be immersed in firsthand, field experiences in addition to simulated experiences invites educators to evolve and rise to the challenges of the 21st century.

According to Ehrenfeld and Huffman (2013) “The scale of the sustainability challenge faced by humanity calls for a fundamental shift in our way of thinking that goes to the core of who we are as a human being, a movement to reexamine who we are, why we are here and how we are connected to everything around us”. Gaining insight into the internal dynamics that drive sustainable development (SD) at the individual level may enable both social and environmental

scientists to predict sustainable behavior and could be applied in education systems to cultivate sustainable behavior.

Summary

The present grounded theory study sought to answer the question of “Why” and “How” the UNEP YCE create sustainable innovations for sustainable development. The data was used to create a 4 E process model which model describes that the UNEP YCE experience macro-level grand challenges which trigger micro-level feelings and cognition that then drive them to leverage their full potential, create synergy with others at the mesa-level and innovate responsibly for social and environmental evolution.

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