

Integrating a Developmental Perspective into Adult Learning, Sustainability Education
and Leadership Development

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Abstract

The purpose of this study is to examine what happens when constructive development theory is introduced in a post secondary program in sustainability education and leadership development, by exploring its impact on personal and professional development of faculty and student's teaching, mentorship, learning, leadership, and scholarship. Very little research has been done to explore the impact of introducing constructive development theory to educators in higher education and more specifically sustainability education and leadership development. Ego development theory and it's research has important implications for how students respond to and make meaning of their learning experiences and how they approach their subject matter and their research. It also has valuable implications for how educators can design and deliver curriculum and mentor their students in developmentally responsive ways, as well as be more aware of their own development and perspective taking capacity. The site of study is Prescott College, and Prescott graduate faculty and students will be invited to participate, with a maximum number of 15. This is a mixed-methods study and will include semi-structured interviews, an action inquiry process involving reflective journaling on guiding questions, and a developmental assessment through the use of the Scti-MAP.

Keywords: Adult Development, Mentorship, Adult Learning, Transformative Learning, Constructive Development Theory, Sustainability Education, Sustainability Leadership, Leadership Development.

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Chapter 1: Introduction

Prologue

This dissertation and research project brings together two threads that have woven themselves through the fabric of my life — the threads are education, and ecology or sustainability. In fifth grade I was taken out of class for testing because my teacher was concerned about my school work. I remember being bored in class. My teacher, Mrs Vitali, started the day by writing the work we needed to complete on the blackboard. I finished the work as quickly as possible because I understood that when I was done, I could move on to activities that interested me more, such as my own reading or interacting with my peers. Apparently the quality of my work wasn't what Mrs Vitali expected. The testing, which I remember including ink blots, assessed me as an underachiever. When I was a teenager, I went to a boarding school in Scarborough, North Yorkshire. I continued to feel moderately invested in my studies, as well as moderately uninspired by school. However, outside of school I was a curious and engaged person. I read a lot, loved exploring and sometimes even engaged in research projects of my own such writing a research report on elephants just for the fun of it. I have a memory of a moment in boarding school walking down the school corridor, when a thought that came as a loud and clear voice in my head saying “something more has to be possible in education”. I am fascinated that I somehow had a sense of a more promising, creative or inspiring approach to education and I have spent much of my adult life working on realizing that vision.

The other thread is my deep and innate connection with the natural world. Like so many others who are nature-oriented, I found deeper connection and an easier sense of belonging in nature than I did in the human realms. This soon translated into a commitment to work on behalf

of protecting and preserving the natural world. At sixteen I joined Greenpeace, began attending community organizing meetings and participated in my first pro-nature, anti-pollution protest march.

These two threads began to intertwine at 18 when I took an internship as an environmental educator. I have been involved in some form of environmental, place-based and sustainability education ever since. At first I was more interested in teaching *about* the natural world, and finding ways of connecting others with nature, however I was soon thinking about *how* we educate as much as what we educate about. I wanted students to feel engaged and empowered in their learning and began to draw on experiential, student-centered, transformative and democratic pedagogies. I also focused on how to cultivate ecological worldviews in my students, essentially how to transform them. I began noticing that some students in our programs included nature and other humans more fully in their circles of care, identity and responsibility, including deeper capacities for perspective taking and empathy, while others didn't. And these same students with smaller circles of care and identity also didn't thrive in our progressive, self-directed and transformative curriculum. I sought to understand why and to become more effective at transforming them.

Around that time I was introduced to adult development theory. My immediate sense was that I had found the tool I was looking for to better transform other's world views and it matched my intuitive sense of some of the patterns of worldview development and provided insight into how to support that development. Seven years later, after studying developmental theory, learning about my own developmental unfolding and applying it to curriculum development and teaching, my aspiration and application of developmental theory is paradoxically almost the opposite. Rather than trying to transform another, as an educator I seek

to meet a student where they are in their learning and developmental unfolding. I do this through listening, seeking to understand, value and respect the student and I have found the developmental models to be profoundly supportive of this. I also listen for what their next steps might be developmentally and seek to support these through curriculum design and mentoring. Meeting someone right where they are, paradoxically appears to support their transformative development, rather than my previous methods of attempting to transform others, which sometimes stimulated resistance and/or a sense of failure or discouragement. Another way of putting this is that I was learning to more fully integrate both poles of the support/challenge polarity in my teaching and mentoring. Also, learning about my own development as an educator, has helped me to be more self aware, including being aware of and better avoiding the tendency to project my own developmental needs onto students - something I did for years but wasn't aware of doing.

Learning about adult development has also transformed my perspectives on sustainability education and the capacities and skills that are needed for sustainability leadership. Sustainability by definition is interdisciplinary. Sustainability challenges are increasingly global, highly complex, and interconnected. As Harvard development researcher Robert Kegan titled his book, we are all "in over our heads". We need to cultivate sustainability practitioners with the skills and capacities to engage and work effectively with complexity, to be adaptive, creative and generative, collaborate with diverse stakeholders and to communicate effectively with a diversity of worldviews and value systems. Adult development points towards these adaptive and transformative leadership capacities as emergent capacities in post conventional stages of development. It also provides a very helpful map or form of internal systems thinking for understanding and working more effectively with the diversity of worldviews involved in most

sustainability challenges, as well as understanding the worldview of the sustainability practitioners themselves. Additionally it reveals the limitations of fighting against something or trying to transform others to adopt an ecological worldview, because of the resistance and opposition such approaches can generate and because worldview development takes time and can't be forced or rushed.

When extrapolated to look at patterns of collective or cultural evolution, adult development offers insight into the 'dignities and disasters' of the worldviews, or the relative contributions and blind spots of each. This has given me a deeper respect and understanding of the aspirations of previous generations and points towards some pathways forward by integrating lessons learned, while seeking to transcend the shortcomings. For instance recognizing the great gains in medicine achieved through science, while moving beyond the limits of a more material worldview, or the gains in innovation and prosperity through free market capitalism, while recognizing the ecological and social costs of this system and addressing these limits through for instance, re-envisioning and re-designing how corporations are structured, as well as the structure of the larger financial systems themselves. This deeper respect and understanding of the aspirations and intent of previous generations and this developmental and evolutionary perspective of our cosmos, has also helped me to transcend or integrate the human/nature polarity of my young adulthood. I see now how humans and nature are one and the same and that we humans have much to learn about reciprocally thriving and flourishing within, and with the planet's systems.

It is my sense that the newly emerging field of adult development, which offers a new understanding of the ongoing neurobiological and consciousness development of adults, has profound implications for both education and sustainability leadership. This research project is

an inquiry into that belief, with a vision to contribute to a growing body of research exploring the implications of adult development in education, sustainability and leadership development.

Introduction

Every generation of humans have faced challenges in their communities in relation to health, wellbeing, sustainability, and justice. Parallel to those challenges, are the collective and individual aspirations and efforts to improve circumstances. Humans appear to have an evolutionary and developmental drive or impulse. We benefit directly from our ancestors dreams, wisdom and hard work. For instance there is less war, more peace, greater health, less poverty (include more specific references) etc., and simultaneously there is increasing awareness of our collective impact, socially and ecologically, and of the interconnected systems of our planet. “We are becoming more conscious of our global influence as a species, and working to mitigate it more than at any other time” (Brown, 2012, p.49). This dissertation and the growing number of graduate programs focused on social and ecological change is a part of this trend and an expression of this impulse.

At the same time, the scope and gravity of the challenges we face and the collective damage of the earth’s systems in the past 200 years appears to be unprecedented. There is increasing consensus among global change researchers that humans have exceeded several planetary boundaries and that there is a real risk of reaching potential tipping points in the Earth’s systems (Rockstrom et al., 2009). The complexity, interconnection and scope of our current social and ecological challenges demands more of humanity than ever before; in terms of the skills and capacities needed to recognize, care about and work effectively with increasing

rates of change, globally interconnected systems and threats to social and ecological health and wellbeing, and a diversity of world views and value systems.

We face an uncertain future and there are many who question whether we are up to the challenge - as I imagine every generation before has done - but the challenge is what we face and we are an immensely creative species living in an evolutionary universe. What more can we do, than do our best to bring about a better world - knowing that as history reveals, there will be advances and there will be damage or limits to our gains, or perhaps even because of our gains. Leaning in to the possibility of a future where humans, society and all of nature thrive in a reciprocal flourishing at every scale of existence and doing all that we can to realize this vision and to lessen suffering and harm can be our gift to the future generations of all of existence.

This dissertation focuses on the implications of emerging research in adult development for how to cultivate the skills and capacities needed for adaptive and transformative sustainability leadership and education. Constructive development theory offers an empirically-based map of how adults develop cognitively, emotionally and behaviorally and can inform the development of curriculum, and the practices of teaching and mentoring (Cook-Greuter, 2006, O'Fallon, 2011). It has the possibility of working in multiple directions at once; to inform what developmentally mature leadership development and adult teaching and learning can look like (by providing a map of emerging capacities); to guide curriculum design, and teaching and mentoring in ways that are developmentally responsive and effective – how to meet students where they are developmentally and support their next steps; to inform the self-awareness and development of educators and leaders; as well as to inform ways of working more effectively with the developmental diversity of a learning community (Cook-Greuter, 2006; Drago-Severson, 2004a, 2004b; Kegan, 1982, 1994; Torbert, 2004; O'Fallon, 2011).

The research examines what happens when constructive development theory is introduced in a post-secondary program in sustainability education and leadership development, by exploring its impact on the personal and professional development of faculty and students, and in particular their teaching, mentorship, and sustainability education/leadership. It also looks at the relationships between stage development and education and sustainability practices and perspectives. The overarching purpose is fourfold; to develop sustainability educators and leaders that can more effectively and transformatively address our complex global challenges; to highlight the importance of integrating interiors (worldviews, values and self-identity) in learning, teaching and facilitating transformative change and to provide a means to do that; to explore deepening the transformative nature of learning and leadership development in graduate education through the use of a developmental framework and assessment tool; and to contribute to advancing the application of adult developmental research to higher education and adult learning in general and sustainability education and leadership development in particular.

The study addresses important gaps in the adult learning, and sustainability education and leadership development literatures concerning the role that ego development (cognitive, affective and behavioral development) plays in perspectives and practices around teaching, mentorship, curriculum design and sustainability education and leadership development.

The site of study is Prescott College's PhD in Sustainability Education and the participants include 6 faculty and 8 students (current and recent alumni). This is a mixed-methods study and includes pre and post semi-structured interviews, a four month action inquiry process involving reading, reflective journaling and group discussion, and a pre and post developmental assessment through the use of the Scti-MAP.

Problem statement

A common belief in the modern world is that adults no longer develop in significant ways once they reach adulthood (beyond general maturing). Contrary to this, the last forty years of research in adult development reveals that adults move through qualitatively different ways of knowing who they are, how the world works, and how they know what they know. In other words, neurological, psychological, emotional and behavioral development continues throughout life, and there are distinctive cross-cultural patterns to this development. Harvard professor Robert Kegan says, “what gradually happens is not just a linear accretion of more and more that one can look at or think about, but a qualitative shift in the very shape of the window or lens through which one looks at the world.” (2002, p. 148).

Some of the general patterns to this development include increasing time frames, expanded perspective taking capacity (first, second, third, fourth and fifth person perspectives), widening circles of care, identity and responsibility and increasing awareness of and capacity to participate in increasingly complex systems. There are also a general trends towards decreasing prejudice, judgment and exclusion of others and a decreasing identification with one’s own worldview and increasing comfort with uncertainty and ambiguity. The general development of identity and care is from a self-focus (preconventional), to a focus on one’s culture or group (conventional), to a more worldcentric (postconventional) and ultimately planet and cosmo-centric values system (Cook-Greuter, 2006; Drago-Severson, 2004a, 2004b; Kegan, 1982, 1994; Torbert, 2004; O’Fallon, 2011).

Sustainability education and leadership development often call for a transformation of worldviews towards a more ecocentric worldview - one that includes care and responsible action towards all species and planetary ecosystems. Additionally, there is often an emphasis on skill

and capacity building towards ... And in adult learning a primary goal of higher education, both inside and outside of the classroom, is to prepare students to handle the complexities of adult life (ref.).

Adult developmental patterns have significant insight and implications for these areas of practice, however, very few sustainability education, leadership development or adult learning programs integrate the findings of adult development theory in their program design and delivery, or integrate it into the teaching itself. Additionally, while there is extensive research cross culturally on the patterns of adult development, there is very little empirical research on the role stage development plays in how someone approaches the practice of sustainability education, leadership, or the practice of teaching, and mentoring. And finally, there is little to no research that I am aware of that looks at the impact of learning about adult development and experiencing a development assessment and developmental coaching on the research participant's development, as well as their practices in teaching, mentoring, sustainability education and leadership.

Purpose

The purpose of this study is to examine what happens when constructive development theory is introduced in a post secondary program in sustainability education and leadership development, by exploring its impact on the personal and professional development of faculty and student's teaching, mentorship, learning, leadership, and scholarship. The overarching purpose of the research is fourfold: to develop sustainability educators and leaders that can more effectively address our complex global challenges, to highlight the importance of integrating interiors (worldviews, values and self-identity) in learning, teaching and facilitating

transformative change, to explore deepening the transformative nature of learning and leadership development in graduate education through the use of a developmental framework and assessment, and to contribute to advancing the application of adult developmental research to higher education and adult learning in general and sustainability education and leadership development in particular.

Constructive-developmental theory is based on the assumption that everyone has a lens through which they experience the world and this lens contributes to the creation of the reality that they experience. Research reveals that these meaning making systems develop over time and with patterns that are consistent across gender, socio-cultural context and other personality differences. Constructive-developmental theory for ego development, created by Jane Loevinger (1970) and expanded upon by Torbert (2004), Cook-Greuter (1999, 2004) and O'Fallon (2011), integrates cognitive (thinking), affective (being or identity) and behavioral (doing) development. Ego development theory and its research has potentially profound implications for how students respond to and make meaning of their learning experiences and how they approach their subject matter and their research. It also has valuable implications for how educators can design and deliver curriculum and mentor their students in developmentally responsive ways, as well as be more aware of their own development and perspective taking capacity. Integrating a developmental perspective into a PhD and MA program in sustainability education, through developmental assessments, coaching and teaching about development itself as a tool for personal and professional development for both students and faculty, has the potential to be transformative for students and educators alike and to support increased effectiveness in cultivating sustainability educators and leaders.

Objectives

- To explore the application of adult developmental research to higher education (adult learning) and sustainability education and leadership development.
- To examine what happens when a developmental perspective (including knowledge and awareness of development and experiencing a developmental assessment and developmental coaching) is introduced in a post secondary program in sustainability education and leadership development.
- To explore how an awareness and knowledge of adult development influences development itself, and the pedagogical practices and perspectives of a sustainability educators and students.
- To examine how a student's developmental stage influences their experience and learning in Prescott College's sustainability education PhD program and their perspectives, research interests and activities/behavior with regards to sustainability.
- To examine how a faculty's developmental stage influences their orientation towards teaching and mentorship of students, curriculum design and their overall beliefs and values about sustainability education and leadership development.

Research Questions

What happens when a developmental perspective (including knowledge and awareness of development) is introduced in a post secondary program in sustainability education and leadership development?

Subquestions

- How does awareness of and knowledge about development influence the practices and perspectives of sustainability educators?
- What are the personal and professional influences on students and faculty?
- What is the developmental impact of learning about adult development?
- How does a student's developmental stage influence their experience and learning in Prescott College's sustainability education PhD program and their perspectives, research interests and activities/behavior with regards to sustainability?
- How does a faculty's developmental stage influence their orientation towards teaching and mentorship of students, curriculum design and their overall beliefs and values towards sustainability education and leadership development?

Methodology Overview

This is a mixed methods research design. Students and faculty in Prescott's PhD in sustainability education program and faculty from Prescott's MAP program were invited to participate, with a final number of 12 participants - approximately half students and half faculty. Participants were interviewed using a semi-structured interview method before their participation and learning about the action logics developmental framework and its applications to sustainability education and leadership. Participants completed a developmental assessment, using the SCTi-MAP, received their results and participated in a developmental coaching session. They also participated in a half-day workshop on integrating a developmental perspective in teaching and leadership for sustainability. For 4 months participants engaged in an action inquiry process including reflective journaling with guided questions, select readings and conference calls every three weeks. After 6 months they retook the SCTi-MAP. There was

a second round of interviews using the same interview protocol and questions, after which the participants received the results of their 2nd SCTi-MAP.

Add more here

Conceptual Framework

Constructive development theory, sustainability leadership and sustainability education, and adult learning theory focused on transformative learning, form the conceptual framework that guides the inquiry.

Constructive development theory

Constructive-developmental theory, as discussed earlier, is one of a number of stage theories in the larger field of adult development (Cook-Greuter, 2006; Drago-Severson, 2004a, 2004b; Kegan, 1982, 1994; Mezirow, 2000; Torbert, 2004; O'Fallon, 2011). Constructive-developmental theory focuses on the development of meaning making processes and concerns the development of how adults understand themselves and the world. The constructive-developmental framework for ego development was originally created by Jane Loevinger (1970), was expanded upon by William Torbert (Torbert, et al., 2004), with additional research on the later developmental stages by Susanne Cook-Greuter (1999, 2004) and more recently by Terri O'Fallon (2011). Ego development includes cognitive, behavioral and affective development. In my research, I explore the impact of introducing a developmental perspective to faculty and students in a graduate program in sustainability education and leadership development and how adult development influences practices and perspectives on teaching, mentorship, sustainability

education and leadership development. I also use adult development as a hermeneutic lens to guide the design of the study, and the data analysis.

Sustainability Education and Leadership Development

Stephen Sterling defines sustainable education in the following way:

A change of educational culture, one which develops and embodies the theory and practice of sustainability in a way which is critically aware. It is therefore a transformative paradigm which values, sustains and realizes human potential *in relation to* the need to attain and sustain social, economic and ecological well being, recognizing that they must be part of the same dynamic. (Sterling, 2001, p. 22)

In this definition Sterling makes the connection between sustainable education and the need for a transformations of meaning making and ways of being and doing in the world.

Prescott College defines sustainability education in the following complimentary way:

Education for sustainability is the practice of learning how to achieve global and local sustainable communities. It is a life-long, individual, and social learning progression that challenges the dominant ecological, psychological, economic, and social paradigms. The desired outcome is an informed, involved citizenry with the social and scientific literacy, commitment, and creative problem-solving skills to engage in responsible individual and cooperative actions toward a sustainable society. Achieving sustainability in all dimensions of human existence depends on adopting an educational paradigm that manifests and supports change toward a sustainable, secure society. The Limited-Residency Ph.D. program in Sustainability Education strives to contribute to synergistic

learning and change in consciousness, education, culture – and, ultimately, society.

(Prescott College Ph.D. Program in Sustainability Education Website, 2013, para. 2 & 3)

It is common in the overall field of sustainability education to call for a transformation of consciousness or worldviews, as well as lifestyles and behaviors to more adequately address the complexity and scope of the ecological and social challenges that we presently face. However there is less understanding about how to achieve these transformative changes in education. Sustainability leadership theory similarly points towards the role that worldviews and values (Boiral, Cayer & Baron, 2009; Brown, 2012, Esbjorn-Hargens, 2010), competencies (Hind, Wilson, & Lenssen, 2009), and behaviors (Doppelt, 2010; Quinn & Dalton, 2009), play in cultivating effective sustainability leadership. The research that has been done in these areas is exploratory, and none of it has yet to examine the impact of introducing a developmental perspective and only one recent study measured the influence of developmental maturity on the design of sustainability initiatives (Brown, 2012). However, developmental research applied to leadership perspectives, capacities and behaviors reveals that leaders with a more complex meaning making system have access to enhanced and new capacities that others do not. This strengthens their ability to respond to sophisticated challenges (Brown, 2012; Kegan, 1994; Rooke & Torbert, 1998; Torbert et al., 2004). This suggests that education that understands and supports adult development will also be effective for cultivating sustainability leadership capacities.

Adult Learning Theory and Transformative Learning

Mezirow (1990, 1991, 2000) coined the term transformative learning to describe:

...the process by which we transform our taken-for-granted frames of reference (meaning perspectives, habits of mind, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change and reflective so that they may generate beliefs and opinions that will prove more true and justified to guide action. (2000, p. 7-8)

Although transformative learning researchers' and theorists' have different opinions about the process of transformation, there are three common components identified as essential for transformation: reflective discourse (Mezirow, 2000), critical reflection (Brookfield, 2000; Mezirow, 2000), and informed action (Yorks & Marsick, 2000), the desired result of discourse and critical reflection (Daloz, 1999, 2000). Adult educators and researchers have found that transforming learners' habits of mind from one way of thinking and knowing to another is challenging (Mezirow, 2000; Taylor, 2000). Constructive development theory can be helpful in understanding the transformative learning process, some of the challenges and what is meant by transformation (Kegan, 1982, 1994; Daloz, 1999, 2000). While there has been research that looks at the developmental stage of students and their experience of different transformative learning curriculum, no research has been done (as far as I am aware) to assess the transformative impact of introducing developmental knowledge and an assessment to graduate students and faculty.

One of the ways that transformative learning is relevant to adult learning is the pace of change in today's world. Learning new skills isn't always enough to address the changing demands of life and work. Transformative learning is particularly relevant to sustainability education and leadership development because of the need for transformative and adaptive leadership. Applying constructive development theory to adult learning and transformative

learning has the potential to illuminate the transformative process and to guide educators in curriculum design, mentorship and teaching practices.

Rationale and Significance

Very little research has been done to explore the impact of introducing constructive development theory, including awareness, knowledge and a developmental assessment, to educators in higher education and more specifically sustainability education and leadership development. Emerging research in the field of adult development has potentially significant implications for professional development, and the practice of mentorship, teaching and curriculum design.

My hope and expectation is that this research project will support faculty and students to be more effective and transformative as educators, leaders and change agents. I expect that I will learn about the impact of introducing developmental frameworks to diverse audiences and gain some knowledge and awareness of what works better and not so well.

As a result of six years of learning about adult development theory and learning about different ways of introducing these frameworks, in addition to my explorations of the implications for teaching and mentorship and my experiences in transformative sustainability education and leadership development, that I have and continue to develop the knowledge and skills to undertake this project.

This study may be useful for the participants, in that they will develop knowledge and understanding of the role that adult development plays in teaching, mentorship, sustainability education and leadership development. It may be useful in the field of sustainability education

and leadership development. It may also be useful in adult education and higher education in general.

Assumptions

These are the central assumptions I hold as I begin this research:

- The central tenet of constructive-developmental theory is accurate: humans, in general, develop through increasingly complex stages of meaning-making and ways of being;
- There is enough developmental diversity amongst faculty and students at Prescott College to make introducing a developmental perspective to teaching, learning and scholarship worth researching;
- That a student or faculty's developmental stage significantly influences their practices and perspectives about sustainability education, leadership, teaching and mentorship and is therefore worth taking into consideration in how we teach, mentor, design curriculum and cultivate sustainability educators and leaders.
- That a developmental approach to teaching, mentorship and curriculum design has potential value for both meeting students where they are developmentally, as well as supporting and mentoring their next developmental steps.
- That a developmental perspective can contribute to cultivating a deep respect and acknowledgement of students (and faculty) as whole beings, perfect as they are, while valuing and supporting their potential for development.

Conclusion

The research examines what happens when constructive development theory is introduced in a post-secondary program in sustainability education and leadership development, by exploring its impact on the personal and professional development of faculty and students, and in particular their teaching, mentorship, and sustainability education/leadership. It also looks at the relationships between stage development and education and sustainability practices and perspectives. The study addresses important gaps in the adult learning, and sustainability education and leadership development literatures concerning the role that ego development (cognitive, affective and behavioral development) plays in perspectives and practices around teaching, mentorship, curriculum design and sustainability education and leadership development.

The following chapter includes an overview of the literature of adult development, sustainability education and leadership and adult and transformative learning, directly related to the study.

Chapter 2: Literature Review

Introduction

This literature review addresses the question: What happens when a developmental perspective (including knowledge, awareness and assessment of development) is introduced in a post-secondary program in sustainability education and leadership development? It explores the impact of applying developmental lens to sustainability education, teaching and mentoring, and leadership development. The literature review explores what is known about the application of adult development to adult education, transformative learning, leadership development and sustainability education and what the limits and critiques are. The two primary areas of focus are the intersections between adult development and sustainability education and leadership development, and the intersections between adult development and adult and transformative learning.

Sustainability Education

Stephen Sterling defines sustainable education in the following way:

A change of educational culture, one which develops and embodies the theory and practice of sustainability in a way which is critically aware. It is therefore a transformative paradigm which values, sustains and realizes human potential *in relation to* the need to attain and sustain social, economic and ecological well being, recognizing that they must be part of the same dynamic. (2001, p. 22)

In this definition Sterling makes the connection between sustainable education and the need for a transformations of meaning making and ways of being and doing in the world. Prescott College defines sustainability education in the following complimentary way:

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(Prescott College Ph.D. Program in Sustainability Education Website, 2013, para. 2 & 3)

It is common in the overall field of sustainability education to call for a transformation of consciousness or worldviews, as well as lifestyles and behaviors to more adequately address the

complexity and scope of the ecological and social challenges that we presently face. While sustainability and social and ecological change work points towards the need to change behaviors, lifestyles and the design of human systems, there is a growing recognition that these changes are difficult to achieve without considering the worldviews, mindsets and values of the people you are either trying to change or to engage in your efforts to create change.

Sustainability researchers McEwen and Schmidt emphasize the role of worldviews in the following statement: “Sustainability is as much about the mindset through which the world is seen as it is about the activities taken in support of it” (2007, p. 30). The increasing recognition of the role of values and worldviews in social and ecological change work is reflected in the development of new fields such as conservation psychology, which applies psychological findings to sustainability and conservation efforts (Clayton & Myers, 2009; Saunders, 2003), and the growing interest in research on values, beliefs and perspectives related to sustainability challenges, such as Yale University’s “Global Warming’s Six Americas” (2008), and Mike Hulme’s well regarded book titled *Why We Disagree about Climate Change* (2009). Research on worldviews and values and their role in social and ecological change work tends to be aimed towards understanding the diversity of perspectives at play in relation to particular issues, to better design campaigns, change initiatives and communication strategies etc., as well as how to transform these worldviews and their associated behaviors away from more anthropocentric worldviews and towards more ecocentric and sustainability-friendly worldviews.

In sustainability education there is also an increasing integration of and call for transformative and whole person learning (O’Riordan & Voisey 1998, Cress, 2004, Sterling, 2002, Reid, Mustakova-Possardt & Podger, 2010). Sustainability educator and researcher Heather Burns articulates this when she says “if educators are to effectively prepare learners with

the knowledge, skills, and values they will need for creating more sustainable places and communities, a transition must be made from transmissive teaching models to transformative learning processes” (2011, p. 1). How to achieve the transformation of worldviews and values is not well understood and is rarely grounded in or informed by the research in adult developmental psychology.

In the past decade, however, there have been more studies looking at the implications of developmental psychology for sustainability education including Reid, Mustakova-Possardt and Podger’s study on “A whole-person approach to educating for sustainability” (2010) and Meyers and Beringer’s study of cognitive and identity development of college students in learner centered and project based sustainability pedagogy (2010). Reid et al., state that much of what sustainability education calls for in terms of capabilities and disposition, such as selflessness (Taylor, 2000), a “connective cultural consciousness” informed by a relational worldview (Sterling, 2007), and a new ecological, humanistic, and transformative worldview that assumes interdependence and interconnection, have been shown by psychological developmental research to pertain to mature critical moral consciousness (Mustakova-Possardt, 1998, 2004), in other words, later stages of adult development. Their case study, albeit limited in scope, suggests that a whole-person approach to education for sustainability may yield more fruitful societal and personal benefits than traditional, and predominantly, behavioral approaches. Meyers and Beringer make the point that although theory and practice of sustainability education at the post-secondary level has increased greatly in the last few years (Adomssent, Godemann, & Michelsen, 2008), and in particular curricular theories and pedagogical innovations (Beringer, 2007; Beringer, Adomssent, & Scott, 2008), the scholarly literature analyzes such conceptions without reference to well-established understandings of students’ college-age development,

which they would do well to address. They argue that “emancipatory sustainability education at the post-secondary level needs to be informed by psychological theory on college-age intellectual, moral, and identity development” (p. , 2010).

To conclude, sustainability education increasingly advocates for integrating a transformative approach to learning and calls for worldview transformation to cultivate the values and capacities needed for sustainability work. Research in adult development informs how students (and faculty) perceive and orient to sustainability, how to design pedagogies to address different developmental needs and suggests that many of the aims and outcomes of sustainability education, including its call for a transformation of worldviews, has developmental implications. However, the only research done in this regards has been either theoretical or exploratory. Research applying adult development theory to sustainability education at the postsecondary level, such as this study, can begin to address these gaps in the literature.

Sustainability Leadership Development

This section reviews literature and research on sustainability leadership and in particular the role that worldviews, values and adult development can play in cultivating effective sustainability leadership. This research, which has mostly been exploratory and theoretical provides insight into the psychological foundation underlying leadership action (Boiral, Cayer & Baron, 2009; B. C. Brown & Riedy, 2006; Esbjörn-Hargens & Zimmerman, 2009). Sustainability leadership and change leadership literature is included because there is more research (albeit limited) that explores the relationship between worldviews, values, adult development, and sustainability practice, than can be found in the sustainability education literature, and because sustainability education in higher education is often informed by the work of sustainability practitioners, leaders and change agents. For the purposes of this research, the term leadership isn't limited to individuals that hold a particular role or position of leadership, rather it includes anyone working towards positive social and ecological change, individually and/or collectively.

In general, research in the field of sustainability leadership is still at an early stage, with limited quantitative results (Cox, 2005; Gustafson, 2004; Quinn & Dalton, 2009). The lack of large-scale, empirical research makes it difficult to draw conclusions about the nature of sustainability leadership, however there are patterns that the research points towards.

Many in the sustainability and change leadership fields observe that the complexity of social and ecological challenges and rapid rates of change, call for leadership that is adaptive, collaborative, transformative and creative (Heifetz, Sharma, 2000, Brown, 2012). This is articulated by Boiral, Cayer and Baron in the following: “the complexity of environmental issues, their interdisciplinary and global nature, the surrounding societal pressures, and the

internal transformations they necessitate all create the need for specific skills, changes, and approaches” (Boiral, 2006; Fernandez et al., 2006; Sweet et al., 2003, as cited in Boiral et al. 2008). From their review of the environmental leadership literature, Boiral et al. summarize that in addition to environmental or sustainability values, leaders engaged with these issues need to be able to: (i) deal with the complexity of environmental issues; (ii) integrate seemingly contradictory outlooks; (iii) understand and address the expectations of a wide range of players; and (iv) profoundly change organizational practices” (2008, p. 483). They, like other leadership scholars who consider the development of sustainability leaders, propose that *how* a leader knows, is at least as important as *what* a leader knows (Boiral et al. 2009, Brown, 2012). Eigel articulates something similar in the following: “it is not the content of a behavior or leadership style that matters, that is, what is actually done or believed, but rather how one epistemologically makes sense of the content of the behavior or leadership style that makes a difference” (Eigel, 1998, p. 27).

Boiral et al. (2009) looked at the existing literature on leadership and constructive-developmental psychology (e.g., Cook-Greuter, 2004; Rooke & Torbert, 2005; Torbert, et al., 2004), and extrapolated it to environmental leadership. They hypothesize a close relationship between how leaders address environmental issues and their action logic. A table summarizing their seven action logics of environmental leadership can be found in Appendix A. Their proposition requires further empirical research on the behavior of sustainability leaders with different action logics.

Another theoretical application of constructive developmental theory to sustainability and ecological identity was conducted by Esbjörn-Hargens (Esbjörn-Hargens & Zimmerman, 2009; Hargens, 2005). He proposes a model of eight “ecological selves” which represent different

ecological worldviews, abstracted from constructive-developmental research. To do this, he draws upon the action-inquiry research of Cook-Greuter (1999) and Torbert (2004) on post autonomous ego development, as well as the “value memes” of Beck and Cowan (1996), based upon primary research in values by Graves (1974, April, 2005). The ecological selves embody the various value systems that individuals might hold with respect to the natural world.

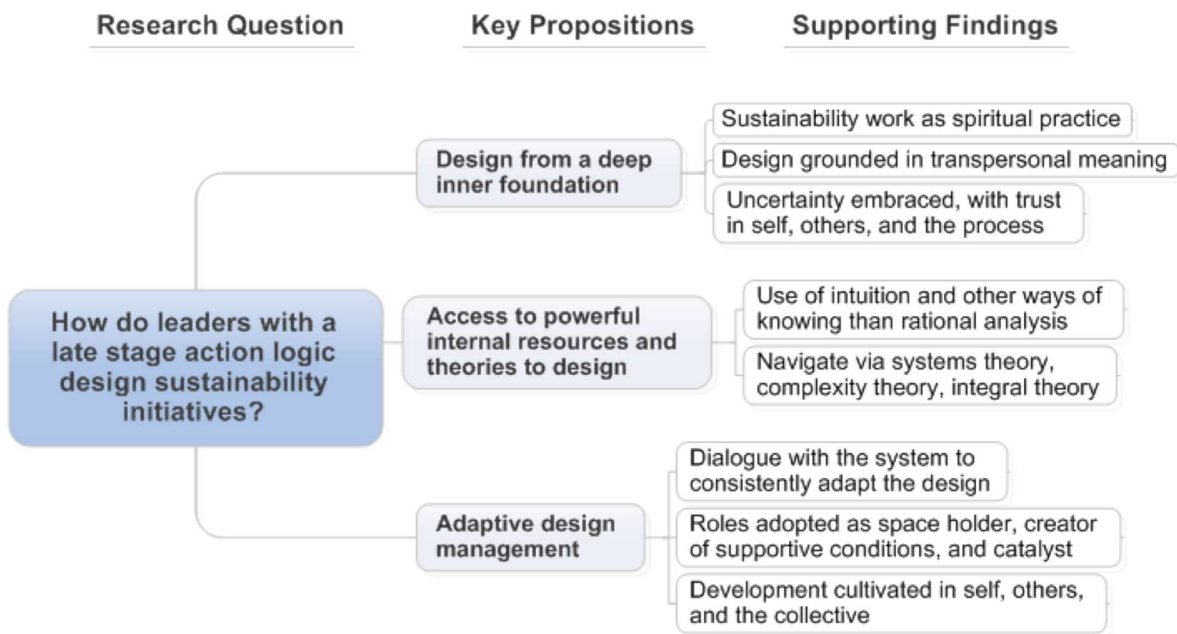
Doppelt (2003, 2010), who interviewed 57 senior leaders in business and government from North America and Europe about their change strategies for sustainability, built a framework for leading change toward sustainability, drawing heavily on fundamentals in systems thinking (Bertalanffy, 1968; Laszlo, 1972) and change leadership models (Kotter, 1996; O'Toole, 1996). He argues that too much attention is placed on new technologies and policy instruments for sustainability and that there has been insufficient focus on how to change the internal thought processes, assumptions, and behaviors required to adopt such tools and techniques. To change organizational culture, Doppelt recommends addressing two key areas: (a) the organization's governance system, and, (b) its leadership (Brown, 2012).

Barret Brown's study is the only study I found on sustainability leadership that measured the action logic of its participants. His research looks at how sustainability leaders with post-conventional meaning-making systems or action logics, design and engage with sustainability initiatives (2012). Brown found that these post-conventional leaders: (1) Design from a deep inner foundation, including grounding their work in transpersonal meaning; (2) Access non-rational ways of knowing, and use systems, complexity, and integral theories; and (3) Adaptively manage through “dialogue” with the system, three distinct roles of space holder, catalyst and creator of supportive conditions, and developmental practices. He concluded that “a constructive-developmental lens offers considerable insight for sustainability leadership theory”

and that “all leadership programs should include the development of meaning-making capacity, in view of the enhanced abilities that may emerge with each postconventional stage” (Brown, 2012, p.189).

Table 1 offers a summary of Brown’s findings (2012).

Summary of the major propositions and supporting findings



A 2013 study by Brown and Divecha explored correlating action logics to how people talk about sustainability. The researchers worked towards developing a model of this correlation through an iterative process of examining interviews of 47 sustainability leaders, thirteen of whom were participants in Brown’s PhD research and had already gone through a developmental assessment. The remaining thirty participants, mostly senior managers in two multinational corporations, were interviewed and the transcriptions of the interviews were coded against the action logics model, which was then refined and rechecked against the data. A more detailed view of the model can be found in Appendix I. The authors acknowledge that what they have

developed is the outline of a model, rather than a rigorous metric, that demonstrates to how to correlate sustainability statements to action logics with very low uncertainty. The development of such a metric, while valuable for the sustainability field, would require more research to develop. However this model can be helpful in characterizing sustainability perspectives and meaning making. The authors offer that:

Categorizing sustainability with action logics may help realize the benefits of developmental perspectives for deeper understanding. The potential is to expand the research to create a more comprehensive and validated model (and/or metric) for assessing people's sustainability understanding and views. Such a sustainability action logics model may be useful for enabling better and more effective sustainability interventions. (2013, p. 20)

Although further research is needed to validate and refine this model, it does illustrate how people make sense of sustainability in distinctly different ways (Brown and Divecha, 2013).

To conclude, the research on sustainability leadership points towards the importance of including values, worldviews, and psychology in our understanding and development of sustainability educators and leaders. Adult development and the action logics framework can be used to better understand and work skillfully with the diversity of perspectives and practices engaged by sustainability practitioners. It offers a more nuanced and detailed understanding of these differences, rather than a more dualistic view of those who have environmental values or an ecocentric worldview and those who don't, or are more anthropocentric in their worldview. Additionally, understanding how sustainability perspectives and practices are likely to develop through the stages informs sustainability education and leadership development. More empirical research is needed to understand the behavior and practices of sustainability educators and

leaders with different action logics, and this research aims to contribute to that gap in the literature.

Adult Development Theory

Adult developmental theory is a branch of developmental psychology. Until about 40 years ago, most developmental research focused on children because it was assumed that when an individual reached their early twenties their development was essentially complete. The field of human development research now recognizes that psychological development continues throughout life, and that there are very distinctive cross-cultural patterns to this development (Cook-Greuter 1999, 2004, O'Fallon 2011, Kegan 1982, 1994, Torbert 2004). These developmental patterns have profound implications for education, mentoring and how students perceive and orient towards concepts and educational processes of sustainability education and leadership development (Drago-Severson, 2004a; Kegan, 1994; Cook-Greuter, 2000; O'Fallon, 2011), however it is still relatively rare that adult educators, and more specifically sustainability educators, draw on the findings of adult development and even more rare that curriculum design and teaching practices are adjusted for developmental diversity among students. Teaching about adult development as a tool for sustainability education and leadership development is even rarer still.

Constructive-Developmental Theory

History and Background

Constructive-developmental theory is one of a number of stage theories in the larger field of adult development. Other stage models for cognitive and other forms of personal development include the development of operational thought (Piaget, 1970), moral development (Gilligan, 1982; Kohlberg, 1984), spiritual development (Fowler, 1981), self-development through adulthood (Kegan, 1982, 1994) and ego development (Hy and Loevinger, 1996). Constructive-developmental theory focuses on the development of meaning making processes

and concerns the development of how we understand ourselves and the world. It is constructive in the way it includes how a person constructs meaning through their interpretations of an experience, and developmental in the way it looks at the patterns of how these meaning making structures, and related sense of self-identity develop over time, as both a natural unfolding and in response to the limitations of existing ways of making meaning (Kegan, 1982, 1994; McCauley et al.).

Although the different stage models focus on different aspects of development, Kegan (1982, 1994) shares some of the common underlying assumptions:

Identifying a stage of development can predict that which a person can comprehend, attend to, and accept responsibility for, that which they are likely to find interesting, worthy of exploration and learning. It helps identify what people can conceive and comprehend if it is presented to them. Identifying a stage of development can also predict the type of “holding environment” that will facilitate further learning and development. This can include the setting, the types of relationships and the set of support services and systems that will provide a secure foundation for further exploration (cited in Boyer, 2005, p.).

Piaget was one of the first developmental theorists to propose a stage model of mental growth. His work built on that of James Mark Baldwin (1897) and other earlier psychologists and sociologists. Piaget called his model genetic epistemology, which he initiated in *The Moral Judgement of the Child* (1948). He explored the ways that children’s capacity for rational thought (later known as cognition) develops in predictable patterns from childhood through adolescence. In *The Origins of Intelligence* (1952), he described four major stages of increasing integration and differentiation in the formation of adult cognition (sensorimotor, pre-operational,

concrete operational and formal operational). The highest stage of cognitive integration that he identified was called formal operations and he projected that this was reached in early adulthood. He considered this to be the prototype of mature reasoning and that it is necessary for modern society.

Piaget made many important contributions to the field of human development. His methods and perspectives essentially gave birth to the field of child developmental research as well as the beginning of an understanding of adult mental growth. He used language as a window into meaning-making, looked for patterns in people's responses to verbal stimuli, described these patterns and then looked for their predictive power in describing behavior (Cook-Greuter, 1999). Piaget also explored the ways that people actively construct meaning to make sense of their experiences. His thinking was that each stage of development is increasingly complex, constitutes a different epistemology or worldview and includes the content of the previous stage and extends beyond it into a more comprehensive meaning system. In Susanne Cook-Greuter's words: "In the most global sense, development can be described as the gradual unfolding of people's capacity to embrace ever-vaster mental horizons and to plumb ever-greater depths of the heart." (p.15, 2000).

Beginning in the late Sixties, several developmental theorists began to challenge the idea that formal operations was the completion of adult development, and began to put forward the idea that some adults continue to develop throughout their lifespan (Loevinger, 1966; Perry, 1968; Kohlberg, 1969). Robert Kegan introduced the term "constructive-developmental" to the literature to refer to these post-Piagetian theories. Limitations to Piagetian and post-Piagetian ideas have been identified by Fischer and Bidell (2006), however other reviews document the continued usefulness and validity of the research (McCauley, et al., 2006).

The constructive-developmental framework for ego development was created by Jane Loevinger (1970) and expanded upon by William Torbert (Torbert, et al., 2004), with additional research into the later stages by Susanne Cook-Greuter (1999, 2004) and Terri O’Fallon (2011). Ego development theory uses the psychological concept of ego as the underlying principle in personality organization that develops and generates coherent meaning throughout life. Ego development includes cognitive, behavioral and affective or emotional development.

This study relies primarily on Cook-Greuter’s (1999, 2003, 2004, 2006) and O’Fallon’s (2011) research on the post-conventional stages of development, because of the extensive research informing the theory, on Torbert’s theory of Developmental Action Inquiry (or DAI) (Torbert, 1991, 2001, 2004, 2007) because of its application to learning and leadership, and secondarily Kegan’s (Kegan 1982, 1994; Drago-Severson, 2004a, 2004b, 2008) Subject-Object theory because of its applications in adult learning.

Types of Development

Developmental researcher, Susanne Cook-Greuter (2004), clarifies that there are two primary ways we develop: these are sometimes referred to as horizontal and vertical development. Both are important to human growth; but they occur in different ways and at varying rates. Horizontal development refers to development within a current mindset through a process of adding knowledge, developing skills, refining perspectives and establishing more connections. Vertical or transformative development, which happens more rarely and in response to persistent discrepancies, which can’t be accommodated through horizontal integration, involves a transformation of someone’s entire way of perceiving and experiencing the world. Developmental researcher Robert Kegan offers that “what gradually happens is not

just a linear accretion of more and more that one can look at or think about, but a qualitative shift in the very shape of the window or lens through which one looks at the world.” (2002, p. 148).

With vertical development (also referred to as stage development) there is an increase in what an individual can be aware of and, therefore, that which they can integrate and act upon. These changes in worldview, the emergence of new meaning-making systems, are often far more powerful in influencing behavior and perspectives than any degree of horizontal growth (Cook-Greuter, 1999).

Human development is seen as a sequence of integrated and increasingly complex meaning-making stages or systems, each potentially more effective at addressing the complexities of life. This is a nested hierarchical process, where each development to a new stage results in a transformation of the previous way of making meaning, while also including the previous stages (Cook-Greuter, 1999). However, human consciousness is a fluid and dynamic process (Kegan, 1984) and therefore, while an individual might be assessed as generally operating from a particular stage of development, it is also clear that there is a tendency to make meaning from a variety of perspectives throughout any one day and that under stress earlier developmental stages might be activated (Cook-Greuter & Soulen, 2007).

Core Assumptions

Constructive-developmental theory shares the following summarized assumptions (Cook Greuter, 2004, McCauley, et al. 2006, p. 636):

- People actively construct their understanding and way of making sense of themselves and the world.

- Growth occurs in a logical progression of stages, evolving from less to more complex and from static to dynamic.
- Later stages are reached only by journeying through earlier stages—each stage transcends and includes previous stages. The movement is often likened to an ever-widening spiral of development.
- Each later stage is more differentiated, inclusive, and integrated—and capable of more optimal functioning in a complex and changing world. However, later stages are not better in any absolute sense, but may be better (i.e., more adequate) in a relative sense.
- As development unfolds, tolerance for difference and ambiguity increases, while defenses decrease.
- Development occurs through interplay between the person and the environment, not just one or the other.
- A person's stage of development influences what someone notices or can become aware of, and therefore, what they can describe, articulate, reflect on, influence and change.

Developmental research reveals that there are fundamentally different ways of making meaning of our world. Some of the patterns of adult development relate directly to how students learn, the kind of mentorship that may best serve their learning and development and how sustainability is perceived and acted upon. Given the implications and potential importance of adult development to teaching and learning, sustainability and leadership development, my inquiry is to explore the impact of introducing adult development theory to faculty and students in a post-secondary sustainability education and leadership development program. Constructive-development theory and in particular Kegan's theory of cognitive development, Loevinger, Cook-Greuter's and Torbert's theory of ego development, and O'Fallon's StAges model are the

primary developmental theories informing this research, because they are the theories most frequently used in leadership, sustainability and adult education literature and because there is more empirical research validating the models. The following sections look at these theories and their application to adult education and sustainability education and leadership development.

Caveats

When discussing development, it is important to remember that humans are complex beings and how they think and behave is influenced by a variety of factors, their action logic being only of these factors. Don Beck who researches the development of value systems, talks about a value system being like a musical note, while its expression is more like a chord or a melody. Beck goes on to describe values systems in this way (1996):

These Value Systems describe *types in* rather than *types of* people. None of these worldviews is inherently better or worse than any other. They differ in levels of complexity, capacity to deal with diverse situations, and degrees of personal commitment. They do not reflect intelligence or character, or temperament, as those dimensions run across worldviews. People value different things because they think in different ways. Everyone is motivated, but we are not motivated by the same things. Each Value System has a particular set of driving forces that stimulate it to action. (p.)

It is important to acknowledge that developmental psychology, while discovering patterns that appear to be universal, it is also an approximation of complex phenomena that will never be fully understood. It is critical that this theory, like all theories be held lightly, with the awareness that even while it offers insights, it also is missing something that is yet to be

revealed. The intention is not to box or limit people to a particular stage, but actually to support their liberation by deeply understanding where they are and meeting them there in a way that paradoxically supports their growth and transformation.

As Beck stated in the above quote, it is also not to suggest that later levels are intrinsically better than earlier levels or that a person is a better person just for having a more complex meaning system. There are unique capacities that emerge with later stages that may be more adequate for addressing the complexity of the world we live in today and the challenges we collectively face, however it is essential to recognize that every stage of development and the myriad ways that people express these has critical contributions and unique perspective to offer society. And every stage or level has both strengths and vulnerabilities. Any devaluing of someone due to his or her development is a misuse of this model. Additionally, the unfolding of developmental perspectives is not predictably evident along the lines of age, gender, nationality or affluence.

Table 2 Comparing Action Logics to Kegan's Subject-Object Stages

Kegan	Cook-Greuter	Torbert	O'Fallon
Stages of Development	Ego Development Stages (1986, 2002)	Action Logics (1991,2003,2004)	StAges: Person Perspective (2011)
Not included			Late 6 th
	6 Unitive	Ironist	Early 6 th
			Late 5 th
Inter-individual	5/6 Construct-aware	Alchemist	Early 5 th
	5 Autonomous	Strategist	Late 4 th
Stage 4: Institutional	4/5 Individualist	Individualist	Early 4 th
	4 Conscientious	Achiever	Late 3 rd
Stage 3: Interpersonal	3/4 Self-Conscious	Expert	Early 3 rd
	3 Conformist	Diplomat	Late 2 nd
			Early 2 nd
Imperial	2/3 Self-defensive	Opportunist	Late 1 st
	2 Impulsive	Impulsive	Early 1 st

(Adapted from Cook-Greuter 2003, Kegan 1994, Torbert, 2004, O'Fallon 2011)

Table 2 offers an overview of the stages of development, the stage names and the person perspectives that characterize each stage, and compares between developmental researchers Kegan (1994), Cook-Greuter (2003), Torbert (2004) and O'Fallon (2011).

Kegan

Robert Kegan's (1982,1994) theory of adult development speaks of orders of consciousness or of the increasing ability to take as object that which one previously could only experience subjectively. In Kegan's words "what we are unconsciously embedded in or subject to at one stage, becomes an object that we can consciously organize and reflect upon at the next

stage” (citation). This theory is concerned with the construction of an individual’s understanding of reality and with the development of that construction to more complex levels over time.

Kegan proposes five distinct stages—or orders of mind—through which people may develop.

When developmental transformative occurs, according to Kegan it involves changing the very form of the meaning-making system, towards one that is more complex, more able to deal with multiple demands and uncertainty (1994).

Kegan’s framework is often referred to as the subject object model of development because it differentiates that which is subject and that which is object at each of the five orders of consciousness. When we are subject to something, it remains invisible to us and is experienced as a part of the self. These are our unquestioned and you could say *unquestionable* beliefs Kegan (1994) asserts, “We cannot be responsible for, in control of, or reflect upon that which is subject” (p. 32). Object on the other hand are “those elements of our knowing or organizing that we can reflect on, handle, look at, be responsible for, relate to each other, take control of, internalize, assimilate, or otherwise operate upon....we can do something with” (Kegan, 1994, p. 32).

Kegan’s five orders of mind are based on the move from subject to object; what we are subject to at one stage becomes object at the next. The process of increasing differentiation and then integration or re-integration is an essential part of being able to reflect on and further develop one’s teaching and sustainability leadership and education practices. It also offers insight into what a student may or may not be capable of developmentally. For instance, asking young adults to articulate and reflect on their worldviews can be a valuable learning experience in the sense that it introduces them to the idea that everyone has a worldview, however it is likely that this will be a very challenging if not impossible task for them developmentally.

Kegan uses the Subject-Object interview to assess an individual's "orders of consciousness". This is a semi-structured interview in which participants are asked to speak about recent and significant life events.

The *first order* describes the meaning making of small children and therefore isn't relevant to this study. Most adults make meaning between the *second* and *fourth order*. The *second order*, sometimes called instrumental or rule-based (Drago-Severson, 2010) was once thought to only include older children and adolescents. However, there is increasing evidence that adults can spend many years in this order as well (Adult Development Research Group, 2001). Individuals at the second order can objectively understand their impulses and perceptions, but they are subject to their own needs, interests and desires. Fulfilling their needs and interests are of significant concern and while they are aware that others have their own needs and desires, their concern is mostly about whether the other person's interests will interfere with their own. They tend to be very rule focused and concerned about clear definitions of right and wrong.

The *third order*, also referred to as socialized mind, or 'other-focused', can begin to appear in late adolescence and may last throughout adulthood. Kegan's studies in 1994 found that between 43% and 46% of adults aged 19-55 make meaning at the *third order* or in a transition between the *third* and *fourth order*. Individuals at the *third order* objectively understand their needs, interests and desires, but are subject to interpersonal relationships or how they have been socialized. In other words, they tend to be very concerned about meeting expectations and getting approval. Authority figures are important for setting goals and conflict and criticism are very threatening. They are able to think abstractly, be self-reflective about their actions and the actions of others, and be devoted to something that's greater than their own needs. They have very little sense of what they want outside of other's expectations or societal

roles and have a particularly hard time if there is a conflict in their life between ideologies, institutions, or people, which is increasingly common in our modern world. In this case they can feel “in over their heads” much of the time (Kegan, 1994). Kegan also illustrates that the very notion of “self-esteem” as it is generally constructed is inappropriate at this order because this construction of self-esteem requires an *internal* source for feeling good about oneself.

The *fourth order*, or self-authoring, reflective individuals are able to more objectively see their interpersonal relationships and therefore not be fully defined by them. This is the birth of the socially critical postmodern mind. This order of copiousness is generally considered a measure of adult maturity (or the goal of much of higher education) in the twenty first century, however it is still relatively rare. Research shows that between 18% and 34% of adults between 19 and 55 make meaning at this order (Kegan, 1994). Adults at the *fourth order* have created a *self* that is the author of its connections to the ideologies, institutions, or people which they were previously subject to. The belief that they are subjective to is that the self is self-authoring, self-created and autonomous. They begin to transcend their’s and other’s beliefs, to operate according to their value systems.

The *fifth order*, or self-transforming mind, is seen even more rarely in adults, according to Kegan. Research from 1994 reported that between 3% and 6% of adults aged 19-55 make meaning in the transition between the *fourth* and *fifth order* and that there were no adults in the studies that made meaning fully at the *fifth order*. Individuals at the *fifth order* can take a step back from the act of self-authoring and hold it as object. Their subjective belief is that the independent self develops and is created in relation to other unique identities. They look across inner systems, including their own, to see the similarities that are hidden within what used to look like differences. Adults at the *fifth order* are less likely to see the world in terms of

dichotomies or polarities and embrace paradox. They are grounded in their own values and welcome the influence of others' opinions, values and perspectives, and seek to integrate their vision with others' visions. They are more likely to engage others in a way that invites their learning rather than defending against it (Kegan, 1994).

Application to Adult Learning, Sustainability Education, Sustainability Leadership

Development

Loevinger, Torbert, Cook-Greuter

The constructive-developmental framework for ego development was created by Jane Loevinger (1970) and expanded upon by William Torbert (Torbert, et al., 2004), with additional research into the later stages by Susanne Cook-Greuter (1999, 2004) and Terri O'Fallon (2011). Loevinger's research built on that of Piaget's (1948, 1954) and others. Since its formulation (Loevinger, 1966), the ego development framework has been rigorously validated, refined, and extended (Cohn & Westenberg, 2004; Hauser, 1976; Hy & Loevinger, 1996; Loevinger, 1979, 1998a), resulting in it being "one of the most comprehensive constructs in the field of developmental psychology" (Westenberg & Block, 1993, p. 792, as cited in Brown, 2012, p.32). The framework has been incorporated into thousands of studies worldwide, encompassing more than 11,000 individuals, and translated into at least eleven languages (Cohn & Westenberg, 2004; Cook-Greuter & Soulen, 2007; Loevinger, 1979; Manners & Durkin, 2001 as cited in Brown, 2012).

Ego development theory uses the psychological concept of ego as the underlying principle in personality organization that develops and generates coherent meaning throughout

life. Ego development includes cognitive, behavioral and affective or emotional development and is described by Cook-Greuter (2003) in the following:

A psycho-logical (sic) system with three interrelated components. The operative component looks at what adults see as the purpose of life, what needs they act upon, and what ends they are moving towards. The affective component deals with emotions and the experience of being in this world. The cognitive component addresses the question of how a person thinks about him or herself and the world. It is important to understand that each action logic emerges from a synthesis of doing, being, and thinking despite the term logic, which may suggest an emphasis on cognition...the leadership development framework provides us with one possible account of how individuals navigate the straits of human existence by using navigational lore, common sense, increasingly complex maps, algorithms, and intuition. (p. 2)

Table 3 offers an overview of the three components of the ego development/action logic framework - the synthesis of thinking, being and doing.

Function	A psycho-logy [sic] of human meaning-making which addresses the following essential questions:
DOING Coping Needs & Ends Purpose	Behavioral dimensions How do people interact? What are the needs they act upon, and what ends do they try to achieve? How do they cope and master their lives? What function do others play in an individual's life?
BEING Awareness Experience Affect	Affective dimensions How do they feel about things? How do they deal with affect? What is the range of awareness and of their selective perception? How are events experienced and processed? What are the preferred defenses?
THINKING Conceptions Knowledge Interpretation	Cognitive dimensions How does a person think? How do individuals structure experience, how do they explain things, make sense of their experience? What is the logic behind their perspectives on the self and the world?

(Adapted from Cook-Greuter, 2003)

Loevinger (1976) developed the Washington University Sentence Completion Test (WUSCT) (Loevinger & Wessler, 1970; Manners & Durkin, 2001) to assess differences in meaning-making. The WUSCT focuses on how individuals “tend to reason, feel and act in response to their experience” (Cook-Greuter & Soulen, 2007, p. 185). This assessment tool shows the ego construct to be conceptually and empirically distinct from intelligence (Cohn & Westenberg, 2004; Newman, Tellegen, & Bouchard, 1998).

Torbert and associates' early work (Fisher, Merron, & Torbert, 1987; Torbert, 1987) applied Loevinger's framework and the WUSCT to the context of managerial work. From

this work, Torbert developed the Leadership Maturity Framework (LMF), which was then more fully developed in collaboration with Cook-Greuter (2004). The LMF is described as follows:

When applied to managers and leaders, the LMF provides a way of understanding how they tend to interpret events and, thus, how they are likely to act in a given situation or conflict. Although people may have access to several action logics as part of their repertoire, they tend to respond spontaneously with the most complex action logic they have available, or from their center of gravity... The LMF refers to stages as action logics because it focuses on how professionals tend to reason and behave in response to their experience. (p. 278)

As is described in this quote, the developmental stages of meaning-making are called action logics in the LMF framework. This term was chosen to align with the language of organizations and leadership. The LMF or action logics framework describes nine ways of adult meaning making, eight of which are described in the following section.

Torbert and Cook-Greuter revised the WUSCT assessment tool to be consistent with the LMF framework, including more rigorous definitions and measurements of later stages (Cook-Greuter, 2004; Torbert & Associates, 2004). There are two versions of the WUSCT: the Leadership Development Profile (LDP) and the Sentence Completion Test Integral - Maturity Assessment Profile (SCTi-MAP). The SCTi-MAP, one of the more finely tuned and validated assessment tools in the field, is the instrument used in this study. It is discussed in greater detail in Chapter 3 and the actual sentence stems for the assessment profile can be found in Appendix E.

Overview of the Stages of Ego development

Each action logic or stage of ego development, values and interacts with education and sustainability in remarkably distinct ways; each one is essentially operating in a landscape that is unique to their way of being, and seeing and acting in the world. The general patterns to the development of action logics include an increasing time frame, an expanded perspective taking capacity (first, second, third, fourth and fifth person perspectives), widening circles of care, identity and responsibility and an awareness of and developing capacity to participate in increasingly complex systems. There is also a general trend towards decreasing prejudice, judgment and exclusion of others and a decreasing identification with one's own worldview and increasing comfort with uncertainty and ambiguity. The most complex action logics are theoretically available to everyone, meaning that they are a developmental potential from birth. The general development of identity and care is from a focus on one's self, to one's culture or group (pre-conventional worldview), to a more worldcentric view (conventional), to a contextual and systems view (post-conventional) and later to a kosmocentric worldview (Cook-Greuter, 2004). These patterns are then reflected in how people define and participate with education and sustainability.

With each subsequent stage of development there is an increasing capacity to take and hold multiple perspectives and a corollary dis-identification with one's own perspective, in other words an increasing willingness to be curious rather than convinced and an increasing capacity to engage with and truly understand other perspectives. There is also increased capacity to engage with complex and abstract thought and to reflect on one's own interior thoughts, feelings and experiences. Imagine if you can only take a first person perspective – as is true of children and some adults. You have thoughts and feelings, but it never occurs to you that others' thoughts

and feelings could differ. You project your own thoughts and feelings onto others but aren't aware of it. As a second person perspective emerges, there is the recognition that others have their own views and may indeed have views about you. There is increasing capacity for self-reflection and to take perspectives other than your own. A third person perspective offers an outside or 'objective' perspective on reality. And with this arises an interest in the rational mind and the scientific method; to analyze and assess others and their ideas. A fourth person perspective brings with it an awareness of culture and context and their influences on our perspectives. Everything becomes more relative and unique to each person's context; and with it a recognition of the social construction of reality. A fifth person perspective offers a perspective on the very fact that we have perspectives, one that is not only context bound or informed, but one that is aware of the very nature of constructs; that we create the world we experience through the constructs that we hold/create, and that these perspectives develop over time. With this developing capacity to take multiple perspectives, comes an increasing awareness and valuing of the needs, perspectives and concerns of others, including other species (Cook-Greuter, 2004, O'Fallon, 2011).

Table 4 describes six (of the nine) action logics most relevant to Prescott's Sustainability Education PhD program. Included are some developmental patterns of each action logic (Rooke & Torbert, 2005; Cook-Greuter, 2004; O'Fallon, 2011), and the percentage of each action logic found in a sample of 4,500 adults in the U. S. (Cook-Greuter, 2004). Theoretical research on the action logic's experience of and orientation to education and sustainability is also included (Brown, 2005, 2011; Boiral et al., 2009; Esbjorn-Hargens & Zimmerman, 2009; Kegan, 1994; Drago-Severson, 2009; Metcalf, 2011)

Action Logic	Main Focus	Space Frame	Leadership and Feedback Orientation	Time Frame	Systems	Orientation to Education and Sustainability
Diplomat 12% Late 2 nd Person Perspective	Socially expected behavior, approval, “one right way” , avoids conflict, loyalty to chosen group. “Wants to belong” (Norms rule needs)	Ethnocentric “WE” Our circle, our beliefs	Enforces social norms, encourages, cajoles, requires conformity. Feedback received as disapproval, upholds allegiance, social glue	Past and Today	Limited feedback closed systems	Sustainability: Stewardship ethos, sustainability can be a moral & spiritual obligation, Nature as a garden to steward, legacy for children, pollution as a sin, concerns for security. Eco-Manager, Boy & Girl scouts, good citizenship, National Park Service. Education: To maintain the past and respect tradition. By being good, disciplined & following the rules you have a place in society. Black & white thinking
Expert 37% Early 3 rd Person Perspective	Expertise, procedure and efficiency, error free tasks, what’s logical and effective, interiors arise “Knows the answer” , critical of others (Craft logic rules norms)	Early Worldcentric All of us	Seeks perfection, argues own position, efficiency and improvement. Tactical ideas and solutions. Dismisses feedback from non-experts, takes it personally	Months	Early linear systems	Sustainability is a technical issue that requires proven environmental services. Need to gain expertise in environmental knowledge & implement new technologies & solutions. Critique that sustainability lacks a clear definition. Education: To assure the future, become an expert on something, so that you can be of service and build useful things. More nuanced shades of black & white thinking. Difficulty prioritizing tasks, ideas.
Achiever 30% Late 3 rd Person Perspective	Delivery of results, effectiveness, goals, success within system, “What’s successful” , scientific analysis, thinking about thinking (System effectiveness rule craft logic)	Worldcentric All of us	Provides logical arguments, data, makes task/goal contractual agreements, Accepts feedback if it supports goals, optimizes strategic outcomes.	1-5 years	Linear cybernetic systems	Sustainability is the ultimate technical & social challenge, replete with profit & opportunity. Climate change is the most serious problem companies are facing. Waste is proof of inefficiency. Need sus. performance measures. Eco-Strategist. Ecology. Urban planning. Education: To become successful, now if possible. To improve oneself regardless of impacts on health, family etc. Either/or thinking
Individualist 12% E 4 th Person Perspective	Systemic problem solving, dislikes hierarchy, subjectivity of beliefs, questions assumptions, social contexts, recognizes limits to science/analysis “All ways equally valid” (Relativism rules single system effectiveness)	Planetcentric, Sentient-centric	Adapts or ignores rules when needed, or invents new ones, discusses issues, airs differences, welcomes feedback for authenticity. Original, creative solutions.	1-10 years, time relative	Complex adaptive systems	Sustainability is our responsibility to the Planet. With increased freedom, comes increased responsibility to all. Must avoid tragedy of the commons. Intrinsic rights of Nature. Deep ecology, environmental justice. Eco-Radical. Include diverse stakeholders. Education: To respect feelings, self, others, nature. Become good as you can internally, not in superficial or materialistic way. Both/and thinking
Strategist 5% L 4 th Person Perspective	Linking theory and principles with practice, dynamic systems, paradox. Deep appreciation of others, & development “Actualization of self and others” (Most valuable principle rule relativism)	Planetcentric All, developmentally us	Leads in reframing situation so decisions support overall principles, strategy, integrity, catalyses breakthrough shifts, Invites feedback. Works with shadow projections	Multi-generational	Developmental systems	Sustainability requires holistic, complex approach integrating culture, justice & nature. Make decisions based on greatest good for humanity & nature. Sustainable development, New Cosmology, Eco-Holist. Education: To respect the interior & exterior of individuals & collectives by taking into account developmental levels, harmonize all aspects of life & integrate. One within another thinking - paradox
Construct Aware 2% E 5 th Person Perspective	Interplay of awareness, thought, action and effects; transforming self and others. Complexity of meaning making. Constructs. (Deep processes & intersystemic evolution rule principles)	Early Kosmocentric	Reframes, turns inside-out, adaptive, dynamic steering, Feedback part of natural system, essential & held lightly. Generates social transformation. Projections in the moment	Historic Cosmic Time-frame	Early evolutionary systems	Sustainability: Recognizes the plethora of sustainability definitions related to worldviews, & understands they are constructed & reified through belief systems. Bring incredible adaptability to the navigation & interweaving of all of these views. Integral Ecology. Education: To go beyond personal accomplishment & focus on actions that concern the planet, its development and evolution as a whole.

What follows is a brief overview of each of the six stages or action logics drawing on research by Cook Greuter (2004), O'Fallon (2010, 2011), Kegan (1994), and Rooke & Torbert (2005).

Expert Action Logic (36.5% of U.S. adults)

Experts focus on expertise, procedure and efficiency. They tend to have strong belief systems, make decisions based on incontrovertible “facts”, can be reactive problem solvers and may be critical of and competitive with others. Experts tend to be detailed and perfection oriented. This is where an early 3rd person perspective emerges. Individuals operating from this action logic begin to have a sense of their ideas and perspectives separate from their group or culture. It is hard to prioritize ideas here as there are so many new ones available to them and sorting them out is challenging (Cook-Greuter, 2005; O'Fallon, 2010).

Achiever Action Logic (29.7% of U.S. adults)

Achievers are stabilizing the 3rd person perspective and are able to prioritize tasks and goals. They tend to pursue results and effectiveness rather than efficiency only; longer-term goals; future-oriented; in charge of self as agent, initiator rather than pawn of system; systematic (scientific) knowledge. They seek proactive ways around problems, may be unorthodox; begin to appreciate complexity and multiple views, but keep them separate; blind to subjectivity behind

objectivity; seek consensus: ‘agree to disagree;’ value mutuality and equality in relationships; feel guilt when not meeting own standards or goals; behavioral feedback accepted; self-critical. They embrace what is in the moment in a way that liberates them from many defensive constraints and opens possibilities for wise choice and creative responses. Experts have a vague sense of all people being family, but Achievers can carry this forward into world-centric action. Human rights are increasingly important and delivering results and taking responsibility are their hallmarks. They begin to work well in teams and to lead. They have a rich interior life, want to understand themselves forward and backward in time, and introspection and reflection are common (Cook-Greuter, 2005; O’Fallon, 2010).

Individualist Action Logic (11.3% of U.S. adults)

Individualists are able to take an early 4th person perspective, which generally comes about from many trials and errors with goal setting. They become aware of all the times they’ve planned to get to a goal but arrived somewhere else. They can stand back from the 3rd person perspective (make factual judgments) and see contexts – how the 3rd person perspective is in a context (for instance gender, class, race) that colors or influences the factual judgment. With this new perspective they can become very introspective, searching for their own and others subjective assumptions. They begin to recognize different voices for different interior contexts, such as a parent voice, child voice, friend voice, etc. This initiates a search for an authentic self. They are self-motivated towards unique personal accomplishments independent of socially approved roles. They are less interested in goals, more interested in process, and how it unfurls in the moment. Once focused on the analytical mind, they are now interested in feelings and connection between the mind and body, and develop empathy for the well being of a wholeness

larger than their own. They can't prioritize or categorize the voices in the interior or contexts on the exterior. Everything becomes equally valid and relative. They begin to question their own assumptions (new self-focus) and that of others, realize the subjectivity of beliefs, and talk of interpretations rather than truth. They may seek changes in their life and work situations. They begin to adapt their behavior to different contexts, can engage in systematic problem solving and begin to seek out and value feedback. Their time awareness is approximately ten years, and their awareness of space extends to all of sentience and may include the planet itself. The rights of nature and all life are valued and they have an interest in liberating humans from dogma, greed, and judgment. They value consensus and eschew hierarchy of all kinds (Cook-Greuter, 2005; O'Fallon, 2010).

Strategist Action Logic (5% of U.S. adults)

The Strategist is maturing and integrating the 4th person perspective. The search for the authentic self may have progressed to a point where they have settled on an image that can be accepted. A new sense of confidence emerges. They often see the limits of lots of processing, begin to prioritize exterior and interior contexts and want to move forward. They also begin to see nested systems and the developmental nature of levels within themselves and in others. Seeing that development occurs, they may become quite zealous about their own and other's development, and want to take on any and all practices that might support it. They now embrace both process and a future-oriented focus by working with principles, rather than goals. Their time horizon is multigenerational and they can see multigenerational patterns. They begin to recognize their own projections, seeing that what they judge others for (positive and negative) are qualities in their own being. This is seen after the fact through reflection, and supports their

embrace of paradox. Feedback is very important, and they are discerning about what is useful and what is not. They bring together interior /exterior into mind/body integration. Strategists often will not stop their willful approach to development until every practice they can try has been deepened and exhausted. What they do not see is that this will is also coming from their subtle ego, and letting it go is necessary for moving to later levels. They are better able to tolerate the negative traits in others and differences in opinions and values. At this stage of development there is a greater valuing of all of the previous stages of development as necessary for healthy human development (Cook-Greuter, 2005; O’Fallon, 2010).

Construct Aware or Magician Action Logic (2 % of U.S. adults)

This is the beginning of the 5th person perspective, which includes an awareness of the constructs that shape our understanding and experience of the world. Because this represents a newly emerging perspective, individuals in this stage can be overwhelmed by the awareness of so many perspectives and struggle to sort out and prioritize different constructs. This can translate into speech patterns that include stopping and starting sentences and attempts to communicate complex and multi-layered perspectives. The central goal for Construct Aware is to *be aware*. They can perceive the structure of their own thinking processes. As Cook-Greuter (2005) notes: “This is the first time in development that the ego becomes transparent to itself. Final knowledge about the self or anything else is seen as illusive and unattainable through effort and reason because all conscious thought, all cognition is recognized as constructed and, therefore, split off from the underlying, cohesive, non-dual truth. They realize that the pursuit of objective self-identification and rational, objective explanations of the universe are futile—artifacts of our need to make permanent and substantive that which is in flux and immaterial. (p.

28-29). There is an appreciation of ambiguity and polarities – experiencing one within the other, as well as exploring influences and effects from multiple scales (individuals, organizations, history and culture) of existence. They are also more able than any other action logic to deeply access their own past ways of meaning-making. This enables them to tailor their communications and actions to others’ meaning-making systems (O’Fallon, 2010).

Application to Adult Learning, Sustainability Education, Sustainability Leadership

Development

Developmental Action Inquiry

Developmental action inquiry (Torbert, 1991, 2003, 2004) is described by Torbert as “... a kind of behavior that is simultaneously inquiring and productive. It is behavior that simultaneously learns about the developing situation, accomplishes whatever task appears to have priority, and invites a redefining of the task if necessary” (p.1). It integrates organizational learning, Eriksonian psychology, and Loevinger’s stages of ego development extended by the research and work of Cook-Greuter (2004), and offers methods and guidance for reflecting in action, revealing opportunities to adapt behavior and creatively generate new options.

Developmental action inquiry informed the creation of the action inquiry reflection cycles, designed for the research participants to reflect on their experience of learning about adult development and its application to personal development, teaching, mentoring and sustainability education.

Inquiry in action includes subjective intentions for the future, inter-subjective data about the present from multiple points of view, and objective data. Torbert (2003) writes of these interconnected features:

The special power of action inquiry—transforming power—comes from a combination of dedication to our intent or shared vision; alertness to gaps among vision, strategy, performance, and outcomes in ourselves and others; and a willingness to play a leading role with others in organizational or social transformations, which includes being vulnerable to transformation ourselves. (p.9)

Action Inquiry considers the three dimensions of human experience: that of the subjective first person; that of the inter-subjective second person; and that of the objective third person. The action of inquiry moves from the inside out, from the subjective to the objective, beginning with gaps between the current circumstances and the vision of a desired future. It is based on values for first-person integrity, second-person interpersonal mutuality, and third-person organizational sustainability, utilizing practices that help to support these values in individuals and communities.

Regarding these three dimensions of experience, Torbert writes:

Thus, AI [action inquiry] heightens your awareness of your own purposes and assumptions, of the quality of your conversations moment by moment with the other person or persons with whom you are meeting, and of how your action in the moment relates to group and corporate quality. The power of DAI is in its potential for linking personal quality improvement and quality improvement in the immediate conversation with quality improvement longer term in the work group and wider organization. (2003, p. 7)

DAI speaks of the four territories of experience shown in in the table below, as constituting the 1st-person field of action inquiry, which are bounded by the current limits and usually-unexamined assumptions of the self's capacity for perception and sense-making (i.e. the

specific developmental action-logic through which one currently encounters the world). Given the limits, engaging two additional fields of inquiry -- 2nd and 3rd person inquiry, offers a more full understanding, and engagement of reality.

Table 5 The Deep Four Territories of Experience

Territory	Experience
First	Outside events: results of actions, observable phenomena
Second	Own sensed embodiment and performance: one's own behavior, skills, patterns of action as sensed from within
Third	Action Logics: cognitive/affective structures, models, maps, meaning making style
Fourth	Intentional attention: presencing awareness, vision, intuition

Single-loop learning includes of behavioral alterations (Argyris & Schön, 1974; Torbert, 2003, 2004). Double-loop learning, closely akin to our understanding of transformative learning, consists of conscientious changes of assumptions or mental models (broad orienting predispositions that provide us with the criteria for judging and evaluating right or wrong, bad or good) (Ciporen, 2008; Mezirow, 1990, 2000). Triple-loop learning entails the re- visioning or transformation of the underlying intentions and desires that, in turn, affect our mental models and actions (Torbert, 1991, 2003, 2004).

In the second person, the practice of Developmental Action Inquiry is grounded in attention to the quality of communications in the interpersonal sphere, acknowledging that all social and organizational reality is shaped by the ways we communicate. Torbert writes, “action

inquiry is inherently risky because it is played out in real time with real relationships” (2003, p. 34) and requires considerable attention to the way we speak and the way we listen.

Further, Fisher, Rooke and Torbert state:

Engaging in action inquiry is taking the skills identified with the action of inquiry and doing them moment by moment. Only if you take these ideas, skills and encouragement into the contexts of your home, work, loving and living and only if you have remembered them as you were speaking and listening to others; and only if, after observing the conversation, as it was occurring through these ideas, you have changed how you were speaking during the ongoing conversation; only if you have done all this, have you begun to engage in action inquiry. (2003, p.33)

Torbert (2003) wrote: “Developmental Action Inquiry takes us to the very frontier of our current way of balancing. It may even take us beyond our current way of balancing—out of that balance, perhaps temporarily altogether off balance—as our way of balancing transforms” (p. 34). In this sense, DAI provokes or stimulates what Mezirow (2000) calls “disorienting dilemmas” (p. 22), meaning experiences of disequilibrium that might lead to learning and growth by revealing the inadequacy or incompleteness of the prior perspective.

Finally, in terms of the third-person dimension of experience, Torbert advocates for attention to the four territories of operations at the organizational/systems level: visioning (long-term goals and intentions); strategizing (plans for achieving these intentions); performing (tactical actions and organizational behaviors); and assessing (measuring effectiveness) (Torbert, 2003, 2004). Without consideration to the alignment of these operations, long-term sustainability is impossible, whether the organization is a human being, an inquiry group, or a major global corporation.

Single-loop learning is practiced regularly at the Achiever action-logic, double-loop learning is first explicitly recognized at the Individualist action-logic and becomes a touchstone of the Strategist action-logic. Triple-loop, in-the-moment inquiry is increasingly practiced in everyday life at the Alchemist and Ironist action-logics (Torbert et al., 2004).

Adult Learning

Adult Learning is a complex and diverse field of theory and practice and therefore can be challenging to define:

Perspectives on adult learning have changed dramatically over the decades. Adult learning has been viewed as a process of being freed from the oppression of being illiterate, a means of gaining knowledge and skills, a way to satisfy learner needs, and a process of critical self-reflection that can lead to transformation. The phenomenon of adult learning is complex and difficult to capture in any one definition. (Cranton, 1994, p.)

Developmental researcher O’Fallon speaks to this when she says “there is a different educational theory for every developmental stage”, making the point that educators operating from different action logics will be drawn to and enact different educational theories. The idea here is that there are multiple dimensions of diversity including for example family backgrounds, learning styles, age, and culture, all of which influence learning needs and interests, however there is a “hidden form of diversity which Drago-Severson calls “the new pluralism” (2004a), which operates like an internal operating system. The developmental diversity (self-complexity) of both the educators and their students, has significant implications for teaching and learning. Constructive development theory for ego development looks at the development of the whole person (including affective, behavioral and identity development) and therefore integrates and includes many of the other forms of diversity. The dissertation explores this form of diversity - developmental diversity and its implications for sustainability education, and adult teaching and learning.

In addition to the diversity of individuals in a teaching/learning context, the rapidly changing contexts of our lives in the 21st century also informs the needs and aims of adult education. The aims of adult education have often been stated as preparing adults to participate in the domains of work, family, and society (Merriam & Caffarella, 2006). However, accelerating complexity and the rate of changes in our increasingly global worlds call for “innovative habits of learning as a way to better manage work/life situations” (Goleman, 1997; Goleman et al, 2002; Heifetz, 1994 as cited in Nicolaidis, 2008). The ability to think systematically while once a luxury, increasingly becomes imperative if we are to thrive in our more interdependent global society and constructively engage with complex global issues. (Harris, 2002).

Given the diversity and complexity of understanding and meeting the needs of adult students in the 21st century, it is generally recognized that adult education is more effective when it includes knowledge and skill development, *and* the development of worldviews or meaning making structures; not just what we know, but also how we know and how both of these contribute to informing action in the world. Mezirow, who coined the term transformative learning echoes this when he says, “is not so much what happens to people but how they interpret and explain what happens to them that influences their actions hopes emotional well-being and performance” (Mezirow 1991 page 13). In keeping with this, adult learning theory and practice makes a distinction between learning as knowledge acquisition and learning as growth of more complex ways of meaning making, which is sometimes referred to as the difference between informational and transformational learning, or as was mentioned earlier in the chapter, horizontal and vertical learning {Cook-Greuter, 2004; Drago-Severson, 2004a; Kegan, 2000;

Mezirow, 2000}. Both types of learning are important and the key, suggests Kegan (2000), is one of timing: knowing when to give one more attention than the other.

Mezirow (1990, 1991, 2000) describes transformative learning in the following way:

...the process by which we transform our taken-for-granted frames of reference (meaning perspectives, habits of mind, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change and reflective so that they may generate beliefs and opinions that will prove more true and justified to guide action. (2000, p. 7-8)

Although transformative learning researchers' and theorists' have different opinions about the process of transformation, there are three common components identified as essential for transformation: reflective discourse (Mezirow, 2000), critical reflection (Brookfield, 2000; Mezirow, 2000), and informed action (Yorks & Marsick, 2000), the desired result of discourse and critical reflection (Daloz, 1999, 2000).

Adult developmental research applied to adult and transformative learning sheds light on the meaning making process of adult learners, the developmental differences in meaning making and the corresponding learning supports and challenges needed at different developmental stages and the process of transformation itself - attending to the form that transforms (Drago-Severson, 2004a, 2004b; Kegan, 1994). However, it is only relatively recently that researchers have begun to apply a developmental lens to students experience of transformative learning (e.g. Broderick, 1996; Fisher and Torbert, 1995; Harris, 2002, 1996; Kegan 1982, 1994; Weathersby, 1980, McCallum, 2012).

Implications of Constructive Development Theory for Adult Learning

The implications of CDT for adult learning are many and varied and will only be mentioned briefly here, with more discussion in subsequent chapters. Constructive development

theory offers a map of how adults develop cognitively, interpersonally and intrapersonally (vertical development). It can inform the development of curriculum, and the practices of teaching and mentoring for effective and transformative education by informing what more developmentally mature teaching/learning can look like (by providing a map of emerging capacities) and by guiding curriculum design, and teaching and mentoring in developmentally responsive and appropriate ways – how to meet students where they are developmentally and support their next steps, as well as how to more effectively work with the developmental diversity of a learning community (Cook-Greuter, 2006; Drago-Severson, 2004a, 2004b; Kegan, 1982, 1994; Torbert, 2004; O'Fallon, 2011).

The first area of significance is recognizing developmental diversity in the first place. How adults make meaning, how they respond to different educational experiences, their capacities and styles of self-reflection, self-direction and collaborative learning are all significantly influenced by their action logic or developmental stage. Research shows that (find numbers related to general populations, and then university research?). In this particular study, including results from a pilot study, the students in Prescott College's PhD in Sustainability Education developmental assessments ranged from Achiever through Transpersonal. In the same program, faculty's assessment showed a range from Achiever to Strategist. This data gives an example of the developmental diversity that is likely in any group of students or faculty and points to the need to understand how to address such diversity.

Secondly, the research reveals significant difference across the stages with regards to a number of patterns including how someone orients to and perceives feedback, their perspective taking capacities, their space frame or who they include in their circles of care and responsibility, their time frame (differing capacities to include past and future generations in their decision

making and behavior), what rules guide their sense making and choice of action, whether their thinking is more black and white, either/or or both/and, their capacity for and style of self-reflection, and their awareness of and capacities to work effectively with complexity. While knowing something about a student's development clearly does not have predictive power, it can provide insight into students' learning experience. These developmental differences can inform mentoring, teaching and curriculum development. They indicate ways of providing developmentally informed learning supports and challenges. These patterns will be discussed in greater depth in subsequent chapters, however we will look at two of the patterns, perspective taking and feedback, in greater depth here to illustrate a developmental progression across the stages.

Perspective taking is a central pattern of the developmental process. Kegan talks about the subject-object move at the center of constructive development theory; that when we are subject to something, it has us rather than us having it. In other words we aren't able to see it and therefore can't work consciously with it or change it. With ego development and the StAges model, perspective taking capacity similarly expands throughout the stages from 1st through to 6th person perspective and beyond. As you can see in table 6 below, an awareness of our own interior doesn't arise until the beginning of the 3rd person perspective in the Expert action logic. Until this point, self reflection, considered essential for transformative learning, is near to impossible. It's still very difficult at the Expert action logic and needs to be very clearly structured and taught, and will still be challenging. Students operating from an Expert action logic may be prolific at generating new ideas or curriculum for instance, but will have a hard time reflecting on their own process and why they generated the work they did. This becomes easier at Achiever especially if it is clearly tied to goals and outcomes and can be quite

transformative for Achiever students. Self-reflection tends to be highly value by Individualists, and as result, research methods such as auto ethnography and phenomenology become highly valued. Much of higher education aims for critical self-reflection, a capacity that only begins to be available at the Achiever action logic. Another common goal of a more postmodern higher education is social deconstruction and again this capacity doesn't naturally emerge until the context aware capacities of a 4th person perspective. Expecting outcomes that are beyond a student's developmental capacity puts them in over their heads and might be too much of a stretch. It is important to understand the developmental supports that different students might need and integrate these into the creation of curriculum. Its equally important to be attentive to the epistemological demands and assumptions that classes make on students and to recognize that if a student can't engage successfully in an activity, it might be because it is beyond the capacities of their meaning making system.

Table 6 offers an overview of 6 action logics and their perspective taking capacities and patterns of thinking.

Action Logic	Perspective Taking and Polarity Patterns
Diplomat	Late 2 nd person perspective: In relationship with another, can take their own perspective, needs, desires and those of the other. "See others seeing them". Concerned about socially expected behavior, approval, avoids conflict, loyalty to chosen group. Wants to belong. One right way thinking.
Expert	Early 3 rd person perspective: Stands back and observes two others interacting and 'objectively sees what is happening'. Beginning recognition of one's own ideas separate from social groups (interiors arise). Interested in expertise, procedure and efficiency, what's logical. Has a hard time prioritizing these ideas. Knows the answer. Black and White thinking.
Achiever	Late 3 rd person perspective: Interested in rational scientific analysis, success within system, thinking about thinking. Prioritizes ideas for effectiveness and goal-oriented results. Either/or thinking.
Individualist	Early 4 th person perspective: Stands back and can see the objective observer, observing the 2 others – sees that the observer is situated in a social context, and therefore subjective. Aware of social contexts internally and externally. Has a hard time prioritizing contexts – relativism. Both/and thinking.
Strategist	Late 4 th person perspective: Understands and prioritizes interior and exterior contexts, sees developmental unfolding, shapes contexts to support development of self and others. Works with dynamic systems and paradox, linking theory and practice. One within the other thinking.

Construct Aware	Early 5 th person perspective: Stands back and see the previous pattern of observing observers observing, awareness of the constructs we hold, the complexity of meaning making, witnesses the emptiness of words and illusion of meaning. Has a hard time prioritizing constructs.
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(Adapted from Cook Greuter, 2004; O’Fallon, 2011)

Another example of developmental progression that is relevant for curriculum design is how feedback is perceived through the levels. As can be seen in table 7, in the earlier stages feedback can be experienced as very threatening and is only accepted from those considered to be experts in their field. Student to student and collective feedback and assessment processes can be very threatening and not very effective at the Diplomat and Expert levels of development.

Table 7 includes patterns in relation to receiving feedback for the Diplomat through Construct Aware action logics.

Action Logic	Feedback
Diplomat	Receive feedback as disapproval, or as a reminder of norms
Expert	Take it personally, defend own position; dismiss feedback from those who are not seen as experts in the same field
Achiever	Accept feedback especially if it helps them to achieve their goals and to improve
Individualist	Welcome feedback as necessary for self-knowledge and to uncover hidden aspects of their own behavior, to discover their authentic self
Strategist	Invite feedback for self-actualization; conflict seen as an inevitable aspect of viable and multiple relationships
Construct Aware	View feedback (loops) as a natural part of living systems; essential for learning and change; and take it with a grain of salt.

Adapted from Cook Greuter, 2004; O’Fallon,

A third area of the significance of adult development theory and research for education is the recognition that faculty are also in the midst of their own development journeys and have developmentally influenced teaching and mentoring styles. **Epistemology quote.** CDT can support the professional development of faculty through self-reflection and self-knowledge and understanding and consideration of the developmental diversity of students. This kind of

professional development might help educators avoid a common tendency for educators to project their own developmental needs on students, by teaching in a way that matches the educators interests and developmental needs, without realizing it may not be a match for where their students are developmentally (O’Fallon, 2012, Metaintegral).

Additionally, a particular program and school often have their own developmental tendencies related to the culture of the school and the aims of the program and adult learning in general. Although these frameworks focus on the development of individuals, groups or collectives also demonstrate their own developmental patterns that relate to the aggregate development of the individuals, and the culture and development of the collective itself as it matures. Much of post-secondary education is seen as aiming for the development from socializing to self-authoring (diplomat to achiever/individualist action logic) ways of thinking (Baxter Magolda), which includes developing capacities for self-reflection, critical reflection, personal values and voice independent of one’s social groups. Graduate and PhD education often assumes their students have access to these developmental capacities, which is sometimes the case but not always. It is my intuitive that Prescott College’s PhD program teaches from the Individualist/Strategist action logics, valuing self-directed learning, understanding, reflection and critique of the social construction of reality, integration of social and ecological systems in its approach to sustainability and an emphasis on transformative learning. CDT can support and inform program self-reflection and development.

Fourthly, CDT also informs the transformative learning process. CDT sheds light on what we mean by transformation in terms of the “form that transforms” (Kegan, 2000). An understanding of the developmental stages can guide the transformative process by revealing how a student is currently making meaning and what might be next or is newly emerging. This

can inform the kinds of support a student might need and what might be challenging for them (Harris, 2002, McCallum, 2008). In sustainability education there is a common call for the transformation of worldviews from a more anthropocentric worldview to a more ecocentric worldview. Usually this also means from a value system that doesn't value sustainability towards one that does, or more bluntly from the perspective of the sustainability educator, from the way "they" view the world to the way "we" or "I" view the world. The pressure to transform can create resistance in another or overstretch which can result in developmental regression or fallback (McCallum, 2008). Kegan states that both information-focused and transformative learning are important, but the key, he suggests, is one of timing: knowing when to give one more attention than the other. Additionally CDT suggests that developmental movement from one stage generally takes years. Kegan states that it takes five years, however in certain developmental contexts and in response to significant life events, development from one stage to another can happen more quickly. Given that stage development can be slow, that pressure to transform can be counterproductive and that an individual's readiness to transform is particular to their own developmental process, it can be more effective and supportive to provide a mix of challenge and support. Kegan and Lahey emphasize this point in the following: "an optimal incubator for development provides opportunities to both experience success by exercising fully already developed capabilities and stretching toward the development of slightly more complex capabilities" (2006, p. 11).

And finally, research on the emerging capacities at the later stages of adult development can inform the the professional development of educators. Capacities such as context and construct aware (4th and 5th person perspectives),, capacities to engage with complexity and

ambiguity in creative and adaptive ways, and offer a map of developmentally mature teaching strategies that can guide professional development.

Adult development theory has significant implications for and contributions to make to adult learning theory and practice. The following section reviews adult development research applied to education.

Adult Development Research in Education

The research that has been conducted tends to focus in a few main areas: teacher development or preparation particularly for K-12 educators and school leadership (e.g., Garvey Berger, 2002; Hammerman, 2002; Hasegawa, 2004); and the application of a developmental lens to examine the impact on students' development or the learning outcomes in a particular learning context, activity or curriculum. Some of the research, although less of it, looks at the development of particular capacities across the levels such as Nicolaides research on how people navigate ambiguity. There is little to no research that I am aware of that looks at the impact or influence, developmentally and otherwise, from learning about development itself.

Levine 1980 used the theory to assess the personal and professional development of teachers in an elementary school; Kegan and Lahey (2001, 2009) focused their recent research how a developmental perspective helps explain personal and organizational resistance to change. They have designed an exercise to illustrate the covert impact of our meaning-making and begin to facilitate shifts in this dimension. Wagner and Kegan (2006) apply this methodology to systemic and individual change processes in schools. More recently, Helsing et al. (2008) have argued for a developmental perspective for educators' professional development. Sutton et al. (1996) used the constructive-developmental framework from Belenky, Clinchy, Goldberger, and Tarule (1997) to understand preservice teachers' epistemological beliefs. They also suggest that

the pedagogy of preservice teacher education could be informed by thinking about adult development.

Garvey Berger (2002) looked at the link between teacher belief and practice. She examined the way twelve novice teachers understand and believe they have enacted their experience of the Harvard Teacher Education Program (HTEP). Berger's findings suggest that teachers with different developmentally-related capacities for self-complexity are differently able to withstand the socializing forces of their school contexts, to transfer their learning from their HTEP into their classrooms, and to find or create collegial communities.

Hammerman (2002) researched how math teacher's developmental stages of meaning making influenced their ability to translate a professional development institute into practice in their classrooms. Hammerman describes the epistemological demands made on experienced teachers by curricular and pedagogical innovations in mathematics education and found a strong link between the stage of development of the educator and how they are able to integrate and work effectively with constructivist pedagogical reforms. He notes that a 2nd order of consciousness (opportunistic action logic) would interpret the innovations being presented in a way focused on her needs for more pleasure and less pain. Such a focus would result in framing the innovation as a requirement, possibly for a stipend, or for tenure, or for continued certification. A socializing, 3rd order of consciousness (diplomat action logic) would expect that the instructions delivered through the in-service would be entirely prescriptive, sort of a recipe for a better math class. The 3rd order consciousness would want either to accept the entire pedagogy, based on the authority of the experts who designed it, or reject the entire pedagogy, based on the claims of competing experts. A 4th order consciousness (individualist action logic) would be the minimum level of consciousness to absorb the concepts of constructivist thinking

implicit in these pedagogical reforms, because the 4th order is the earliest point at which the self becomes consciously self-creating. Thus, a 4th order consciousness would be able to accept and reject aspects of these pedagogical reforms, paradoxically, exactly the option the reforms strive to attain - the self-authoring ability to reject them.

In a four year ethnographic study, Drago-Severson (1997) researched the opportunities principals have to increase teacher effectiveness and transform school cultures when adapting a developmental perspective to their leadership. More recently Drago-Severson (2004a) has begun to investigate the links to professional development for principals to be sustained as adult educators. Drago-Severson examines how a particular head of school “exercised her leadership on behalf of promoting adult growth. How does this head understand and experience her role? What are the attitudes, beliefs, and values that appear to govern her actions? How are her ideas translated into action?” (Drago-Severson, p. 80) Drago Severson’s study reinforces the usefulness of CDT as a research tool.

Guilleaux also studied the development of principals, The results of this study confirm that the recommended attention to adult learning for aspiring principal programs must go beyond coherent curriculum and blending theory and practice into creating learning environments, because perspective-taking influences what one learns about leadership ().

Hasagewa (2004) looked at how teachers’ developmental stage affected the way they experienced the shift into teacher leader role. She found the higher the complexity of meaning-making, the easier the experience of the shift into more leadership responsibilities was for the teacher. The shift from teacher to administrator is an even more complex shift in role than the shift from teacher to teacher leader in part due the scope for what one has responsibility, and we

can hypothesize that the epistemological development plays an equally if not greater role in the experience and effectiveness of the new role.

Collay and Cooper (2008) used the adult developmental lens of self-authorship (Baxter Magolda & King, 2004) to examine two teacher leadership graduate programs with a focus on transformational learning. In a study that uses adult development theory to characterize adult learning, they found that transformational curriculum did support the development of self-authorship in women teachers. The authors conclude that self-authorship is necessary for effective school leadership in today's complex world.

In addition to teacher and school leadership development, CDT has also been used to examine student's experiences of curriculum and how development influences learning needs and outcomes. Harris (2002) looked at the impact of transformative learning on students with developmental differences. Martynowych studied semester-long experiential leadership courses for graduate students in education and psychology (2006) and Silver looked at open enrollment experiential weekend conferences (2001). McCallum looked at open enrollment experiential weekend conferences (2008). These studies all point to meaning-making as a significant influence on what students learn and experience in their various learning contexts and the development supports students might need to be more effective, successful or transformative.

Harris (2002) sought to address a gap in the transformative learning literature by examining how stage development influences a student's experience of a transformative learning process. She found that the students at earlier stages of development were less likely to experience transformative learning and those at later stages were more likely to. Harris makes the point that transformation can happen at all levels of development however course design might preference transformation at a particular level, which is often the later stages. She also

found that the student's developmental stage influences the nature of the support they require and their use of particular learning strategies.

McCallum (2008) explored the relationship between participant's stages of adult development and their learning experience in a Group Relations Conference. His research indicated that the participants' stages of development do account, at least in part, for the diverse capacities they have for learning from their experiences in this context. And while all participants experienced periods of behavioral regression instigated by the ambiguity, complexity, and conflict they experienced in the learning process, the participants' developmental maturity facilitated how quickly each one arrested their regression, recovered, and made sense of their experience. His findings also suggested that people experienced particular conference challenges differently on the basis of their developmental capacity. One of the three areas of difference involved the participants' capacity to identify and manage psychosocial defensive processes, for instance projection, projective identification, splitting, scapegoating (Vaillant, 1993). The other two differences according to developmental capacity were the participants' ability to find and then exercise their authentic, personal voice in the conference, and their varying capacities for emotional vulnerability.

Nicolaides (2008) looked at the relationship between adult development and how someone experiences and describes ambiguity or uncertainty. She found distinct forms of meaning-making that emerged around the participants' ways of being in relationship with ambiguity (e.g., Individualist: enduring; Strategist: tolerating; Alchemist: surrendering; Ironist: generating). The Individualist inquired into ambiguity, the Strategist learned their way through ambiguity, and the Alchemists or Construct Aware surrendered to ambiguity. Finally, the Ironist generated ambiguity in order to discover the creative potential that it promises. Upon further

analysis, these learning processes suggested an additional distinction between the earlier two action logics (Individualist and Strategist) and the later two (Alchemist and Ironist). Nicolaides referred to this distinction as the “figure-ground” shift that took place in the transition between the Strategist and the Alchemist, where learning took a distinct new shape, beyond the self-directed learning (Knowles, 1975) orientation of the Individualist and the transformative learning (Mezirow, 1991, 2000) capacity of the Strategist.

Gaps in the research

There is very little research on the developmental and other impacts of learning about adult development on educators and students. Philosopher Ken Wilber theorizes that learning one’s development and adult development in general is psychoactive, that it activates development itself. But there is no research to test this. The only study that I am aware of is one conducted by the National School Network program and directed by Dr. Elizabeth Neale. In this study a central part of the curriculum focuses on adult development, has indicated that learning about adult development (i.e. theory and content) and the practices that support it, while actually experiencing those practices has a positive impact on school performance and test scores (Drago-Severson).

Developmental Recommendations Emerging from the Research (Guilleaux)

The findings of the research point towards some recommendations for how to integrate developmental diversity in pedagogy and curriculum design, as well as how to better support transformative learning.

One key area that many studies point toward, is the need to provide both **support and challenge**. As was stated earlier, Kegan (2000) recognizes that both informative and transformative learning are important, but the key is one of timing: knowing when to give one more attention than the other. A person's way of knowing can become more complex (i.e., change) if she or he is provided with developmentally appropriate supports and challenges. Drago-Severson (2004a) and others (Daloz, 1986; Heifetz, 1994; Schlossberg, Waters, & Goodman, 1995; Vygotsky & Cole, 1978; Winnicott, 1965) talk about supporting individuals in their current ways of making meaning while at the same time challenging them with tasks of increasing complexity. Jennifer Garvey Berger who researched the link between teacher belief and practice, recognizes how difficult stage transformation can be - that there are losses as well as gains. To be both supportive and effective at teaching for epistemological transformation she recommends the following three components: Helping students recognize the edge of their meaning making; being good company at the edge; and helping to build a firm ground in a new place (Garvey Berger, 2004, p. 346). Kegan refers to this as providing a developmental or evolutionary bridge (1982, 1994).

Providing a developmental container or well designed **holding environment** is considered to be another key component for transformative learning. According to Popp and Portnow (2001), holding environments need to fulfill three functions in order to support development: holding on, letting go, and maintaining. To effectively provide an environment for transformation, the environment has to support and acknowledge a person's current perspective taking level, while challenging consistently towards a more complex way of seeing. Finally the holding environment has to stick around long enough to provide a space for transition. Kegan (1994) recommends that a holding environment provide a bridge that is anchored in both sides of

the developmental chasm. Cohorts, when used as instructional vehicles, can offer a space with developmental diversity to provide this kind of anchoring.

The **role of reflection** in transformation has been theorized and documented (e.g., Garvey Berger, 2004; Kolb et al., 2000; Mezirow, 2000; Schön, 1983). As mentioned earlier, Garvey Berger (2004) in her work with teachers suggests that the most fertile ground for transformation is reflection at the "edge of our understanding" (p. 352). Understanding that there are limitations of individuals' perspective taking can help one push and stretch one's self. It can also help instructors to differentiate instruction.

Peer relationships also contribute to the holding environment. The beneficial roles of cohorts and communities of practice in leadership programs have been demonstrated (Darling-Hammond, LaPointe, Meyerson, & Orr, 2007). Kegan, Broderick, Drago-Severson, Helsing, Popp, and Portnow's (2001) study of adult learners in three different Adult Basic Education (ABE)/ English for Speakers of Other Languages (ESOL) programs offers evidence for the important role of cohorts in supporting transformation. After a year of observation and interviews, Kegan and his team concluded that adults' ways of knowing can change significantly even over a short period of time. Cohorts were a key element to the changes participants experienced. In addition students in similar developmental levels at different sites showed similar understanding of the role of the cohorts in supporting their learning. The authors also found that the range of developmental levels in the non-English speaking cohort was "virtually identical" to the range showed by an English cohort in a previous study.

A second implication is that building leadership education programs that are transformative requires an attention to the role of the **culture of embeddedness**—the kind of

holding environment the program, the classroom, the curriculum, and the faculty provide for students with a variety of ways of knowing.

Summary

Chapter 3: Methodology and Methods

Introduction

This chapter details my research methodology and methods. The epistemology and general research design are reviewed. I then describe the rationale for the methodology and delineate the processes of participant selection, data collection, and analysis. Finally, I state my anticipated findings and conclude with a discussion of possible internal integrity threats and limitations to the study.

Research Design Overview

This study explores the impact of introducing a developmental perspective into a post secondary program in sustainability education and leadership development. It explores how adult development influences the practices and perspectives of sustainability educators, how the awareness and knowledge of adult development influences the practices and perspectives of sustainability educators, what the personal and professional influences are on students and faculty and what the developmental impact is of learning about adult development and undergoing a developmental assessment and coaching.

The primary research question is:

What happens when a developmental perspective (including knowledge and awareness of development) is introduced in a post secondary program in sustainability education and leadership development?

The subquestions are:

- How does awareness of and knowledge about development influence the practices and perspectives of sustainability educators?
- What are the personal and professional influences on students and faculty?

- What is the developmental impact of learning about adult development?
- How does a student's developmental stage influence their experience and learning in Prescott College's sustainability education PhD program and their perspectives, research interests and activities/behavior with regards to sustainability?
- How does a faculty's developmental stage influence their orientation towards teaching and mentorship of students, curriculum design and their overall beliefs and values towards sustainability education and leadership development?

This is a mixed methods approach to research using developmental structuralism as an interpretive lens. Data will be gathered through two rounds of semi-structured interviews, reflective writing and group and individual phone calls, and a developmental assessment instrument that will be administered at the beginning and end of the study. It also integrates developmental action inquiry to guide the learning process and reflective journaling.

Epistemological Framework

To design a research proposal, Crotty (1998) suggests that four questions be addressed:

1. What epistemology – theory of knowledge embedded in the theoretical perspective – informs the research?
2. What theoretical perspective – philosophical stance – lies behind the methodology in question?
3. What methodology – strategy or plan of action that links methods to outcomes – governs the choice and use of methods?
4. What methods – techniques and procedures – do we propose to use?

Creswell (2003) summarized these ideas into 3 main components of any research design: the knowledge claims (that include a theoretical perspective), the strategies of inquiry that inform the procedure and the method of data collection and analysis. Creswell (1994) summarizes that researchers make philosophical claims about the nature of reality or what is knowledge (ontology), how it is known (epistemology), what values go into it (axiology), how it's written about (rhetoric) and the process for studying it (methodology). These beliefs can be described as research paradigms or worldviews.

The following table is a doctoral student's summary of the research paradigms taught in the California Institute of Integral Studies PhD Transformative Learning and Change degree program (Chow, 2005):

Paradigm	Ontology	Epistemology	Methodology
Indigenous	Reality is a world where people are incarnations of earth spirits. Everything is animate and endowed with spirit.	Ways of knowing is experiential as the indigenous peoples know something is real when they feel and participate in the changes of nature that they are innately part of.	An organic relationship with both the natural and the spiritual world to duplicate and adapt the questioning style of indigenous people. The methodology is in non-linear forms of awareness, receptivity and etiquette respecting the deceased and inanimate objects.
Positivism	A predictable, fully understandable reality is out there.	Knower knows right from wrong; "it's all objective"; ways of knowing is a matter of finding truth.	Methods include experiments to prove true or false; verify hypotheses. Quantitative methods fall into this paradigm.
Post positivism	"There's a reality out there"—critical realism as reality is imperfect, probabilistically apprehendable (Denzin & Lincoln, 2000).	Knower knows but is more critical as things can't be 100% objective and right/wrong is not as clear as it may seem.	Methods are modified experiments; falsification of hypotheses; incorporates qualitative methods of research.

Critical theory	Reality is a world shaped historically by social, political, cultural, economic, ethnic, and gender values (Denzin & Lincoln, 2000).	Knower knows reality in a subjective way. Findings and understandings are always value laden.	Methods of research are dialogic and dialectic (Denzin & Lincoln, 2000).
Constructivism	Reality is a world constructed in the minds of humans. A relativist approach where reality does not exist out there separate from the knower but is a social and experiential construct.	The knower is an active agent of interpreting and constructing the reality based on the social and experiences of her environment. Ways of knowing is derived individually where one cannot know exactly what others know from one's perspective.	Methods and practices for the constructivist to understand "constructing realities" are hermeneutic and dialectical (Denzin & Lincoln, 2000). Understanding is interpreting and reality with an inter-relationship and inter-dialogue where truth begins and unfolds rather than it presenting itself.
Participatory	The world is co-created by mind and given cosmos (Denzin & Lincoln, 2000).	The knower knows reality when in participatory transaction with it.	Methods include political participation and collaboration inquiry with others.
Transpersonal	World is a system of interlocking forces and human experience is synergistic and holistic part of.	Knower can know holistic concepts of multiple realities across the earth and universe. Reawakens deep brain capacities and other ways of knowing.	Methods include integral inquiry, intuitive inquiry, phenomenological inquiry, organic inquiry and alternative ways of knowing (Braud & Anderson, 1998).

Table 8 Summary of Research Paradigms (Chow, 2005).

The epistemological framework for this study is post positivist with an emphasis on critical realism. Post-positivism generally rejects positivism and its philosophical position that only empirical scientific knowledge is valid. It encompasses both relativism and realism. Relativism is a general set of philosophical worldviews that frames all knowledge and truth as contingent, or relative, to certain conditions. It relies on the doctrine that no absolutes exist. The spectrum of relativistic philosophies, in general, view reality as socially constructed, based upon

the interests, values, and viewpoints of the observer. Realism also represents a spectrum of philosophies with three common presumptions. They are: (1) the mind exists independent of reality; (2) we can partially know reality; and (3), the way the world is – at least somewhat – determines the validity of our knowledge. Realism contends that theory can partially capture aspects of reality. However, realism also accepts the relativistic claim that social factors condition knowledge. Therefore, any theory developed is subject to such epistemological filters (Reese, 1996; Van de Ven, 2007).

Critical realism (Bhaskar, 1979, 1998) recognizes and attempts to reconcile the limitations of both logical positivism and relativism. It has a number of key elements. It contends that a real world exists, yet we have limited capacity to fully know it. Our understanding of reality is made fallible by the theories and concepts that filter it. There are, therefore, no absolute, error-free truths in the social sciences. Truth and reality, however, can be increasingly understood through successive approximation, leading to an evolutionary growth of knowledge. Finally, to understand complex reality, multiple perspectives are required, and some methods of inquiry are more appropriate than others (Van de Ven, 2007).

In summary, I assume that the knowledge domains that underlie this research – adult development theory and sustainability education and leadership, and adult learning – gradually uncover truth. This research will continue that approximation while recognizing that the whole or absolute truth of this research domain is unknowable. I acknowledge that my worldview filters and influences my vision and choices, and strive to limit its impact. However, I am working with a reality that exists beyond my mind and is not influenced by my worldview. Therefore I will learn something about reality beyond my subjective interpretation of it. I also believe that by

using mixed methods design, I will access valid knowledge that would not be revealed through either qualitative or quantitative research alone.

Methodology

Mixed Methods Design

The methodology chosen for this study is mixed methods. Mixed methods, as a distinct research approach, is relatively new in the social and human sciences. It appears to have originated in 1959 when Campbell and Fiske used multiple methods to study the validity of psychological traits – through a multi-method matrix – using multiple approaches to data collection including interviews and observations, combined with surveys. Part of the rationale for mixed methods research is that biases in one method can neutralize or cancel biases in another method. Triangulating data sources provides a means for seeking convergence across qualitative and quantitative methods (Jick, 1979) and research from one method can help develop and inform the other method (Creswell, 2003).

There are three general strategies (with a variations in each strategy) that are used to guide mixed methods research:

1. Sequential – in which the researcher seeks to elaborate on or expand findings of one method with another method.
2. Concurrent – where the researcher converges quantitative and qualitative data to provide comprehensive analysis of the research problem.
3. Transformative – where the research uses a theoretical lens as an overarching perspective within the design that includes both quantitative and qualitative methods. The lens provides a framework for the topic of interest, the methods of collecting data, and the

outcomes or changes anticipated by the study – this can be sequential or concurrent (p.16, Creswell, 2003).

The growing interest in mixed methods research is reflected in the increasing number of articles, journal and books that focus on mixed methods approaches (p.208, Creswell, 2003). Some of the challenges to a mixed methods design are that it can be time intensive, and requires a familiarity with both quantitative and qualitative approaches to research.

I have chosen a mixed methods methodology because I am interested in both quantitatively (pre- and post-developmental assessments) and qualitatively (pre- and post-interviews and reflective journals) assessing the impact of introducing a developmental perspective (through knowledge, inquiry and assessment) to students and faculty in a post secondary program in sustainability education and leadership development. The mixed methods strategy I have chosen for the research design is a concurrent transformative strategy. This strategy is guided by the use of a particular theoretical perspective, which in this case is constructive development theory or developmental structuralism and the two types of data are collected concurrently. The design can either be nested (unequal prioritization of the qualitative and quantitative methods) or involve triangulation where both approaches are of equal priority. I will use a triangulation design to look for convergences within the data and the data will be integrated during the interpretation phase.

Developmental Structuralism

Developmental structuralism studies someone's subjective experience from an objective, third-person, "outsider's" perspective. This is done over long periods of time to discern patterns and their unfolding sequences. Examples of patterns that structuralists have found include: Maslow's hierarchy of needs (Stephens, 2000), Kohlberg's stages of moral development

(Kohlberg, 1984), Piaget's levels of cognition (Piaget, 1954), Kegan's five orders of consciousness (Kegan, 1994) and Loevinger's ego-development stages (Loevinger, 1976).

Wilber (2006) describes the practice of structuralism in the following way:

Pose a series of questions to large groups of people. See if their responses fall into any classes. If so, follow those classes over time and see if they emerge in a sequential order of stages. If so, attempt to determine the structure or makeup of those stages. (p.18)
(cited in Brown, 2010).

I won't be conducting structural research, but will be drawing on the research of others, and in particular constructive-developmental theory for ego development, which integrates cognitive (thinking), affective (being or identity) and behavioral (doing) development. This theoretical framework was created by Jane Loevinger (1970) and researched further developed by Torbert (2004), Cook-Greuter (1999, 2004) and O'Fallon (2011).

Site Selection

Prescott College's PhD program in Sustainability Education is the site selected for the study. Participants included Prescott PhD and MAP (Master of Arts Program) faculty and PhD students and alumni. I chose this site because of its advanced degree program in sustainability education, and my access to students and faculty in the program.

Prescott College's PhD program in Sustainability Education strives to promote the evolution of ecological understanding, psychological/philosophical consciousness, and social learning for a humane and sustainable future. The desired outcome is "an informed, involved citizenry with the social and scientific literacy, commitment, and creative problem-solving skills to engage in responsible individual and cooperative actions toward a sustainable society" (PhD Student Handbook, 2012). In addition, Prescott College's mission is:

to educate students of diverse ages and backgrounds to understand, thrive in, and enhance our world community and the environment. We regard learning as a continuing process and strive to provide an education that will enable students to live productive lives while achieving a balance between self-fulfillment and service to others. Students are encouraged to think critically and act ethically with sensitivity to both the human community and the biosphere. Our philosophy stresses experiential learning and self-direction within an interdisciplinary curriculum. (PhD Student Handbook, 2012)

The program handbook references Mezirow's approach to transformative educational methodology that includes engaging the learner through experience, participation, and reflection in the construction of meaning and knowledge (Mezirow et al., 2000). Sustainability educator Stephen Sterling is quoted as stating that sustainability education should be "...essentially transformative, constructive, and participatory" (2001).

The program aims for the transformation of meaning making, how students and faculty perceive and interact with the world ecologically and socially, and how education is conceived of and engaged with. These aims are carried out by drawing on educational philosophies and theories, including adult learning, constructivist, humanist and radical philosophical traditions. The pedagogy, or more accurately termed the andragogy, includes experiential, self-directed and student-centered learning.

Participant Selection

This study used purposive sampling. Purposive sampling was chosen because it is a natural fit with exploratory research. I purposefully selected both the organization and the participants because of their ability to provide data to answer my research questions (Creswell, 2003). This sampling method enabled me to use members of a specialized population for in-

depth investigation. The purpose in using such sampling is to gain a deeper understanding of a smaller population rather than to generalize to a larger population (Neuman, 2003). Invitations were sent to all current and graduating PhD students and to 12 PhD and MAP faculty and administrators at Prescott College. This was a self-selection process. I began the study with 8 faculty and 7 students. Three faculty dropped out of the study, due to time constraints.

Overview of Information Needed

Participants will be interviewed using a semi-structured interview method before their participation and learning about the action logics developmental framework and its applications to sustainability education and leadership. Participants will complete a developmental assessment called the Scti-MAP, receive their results and participate in a thirty minute developmental coaching session with a certified coach. They will participate in a half-day workshop on integrating a developmental perspective in teaching and leadership for sustainability. For 5 months participants will engage in an action inquiry process including reflective journaling with guided questions, select readings and video conference calls every three weeks. After 6 months they will retake the Scti-MAP but won't receive their results until after the second round of interviews using the same questions. Following the interviews participants will receive the results of their 2nd Scti-MAP.

Research Question	Information Needed	Data Collection	Data Analysis
What happens when a developmental perspective (including knowledge and awareness of development) is introduced in a post secondary program in sustainability education and leadership development?	- Description of what happens - Demonstration of what happens	- Interviews (pre and post) - Written Reflections - Verbal reflections on calls - LDP (pre and post) - LDP coaching session - Observation field notes	- Constant comparative analysis: open to analytical coding. Research questions guide creation of categories, and I will look for emergent categories - ATLAS Ti to analyze, code and synthesize transcriptions of the interviews
Sub-Questions			
How does awareness of and knowledge about development influence the practices and perspectives of sustainability educators?	- Participant describes influence on practices and perspectives - Demonstration of influence (or lack of) through comparison of pre and post interviews, pre and post LDP and journals	- Interviews (pre and post) - Written Reflections - Verbal reflections on calls - LDP (pre and post) - LDP coaching session - Observation field notes	- Constant comparative analysis: open to analytical coding. Research questions guide creation of categories, and I will look for emergent categories - ATLAS Ti to analyze, code and synthesize transcriptions of the interviews
What are the personal and professional influences on students and faculty?	- Participant describes personal and professional influence - Demonstration of influence (or lack of) through comparison of pre and post interviews, pre and post LDP and journals	- Interviews (pre and post) - Written Reflections - Verbal reflections on calls - LDP (pre and post) - LDP coaching session - Observation field notes	- Constant comparative analysis: open to analytical coding. Research questions guide creation of categories, and I will look for emergent categories - ATLAS Ti to analyze, code and synthesize transcriptions of the interviews
What is the developmental impact of learning about adult development?	- Change in LDP score - Change in sentence stem responses	- LDP (pre and post) - LDP coaching session	
How does a student's developmental stage influence their experience and learning in Prescott College's sustainability education PhD program and their perspectives, research interests and activities/behavior with regards to sustainability?	- Developmental stage - Participant describes influence on practices and perspectives - Demonstration of influence (or lack of) from interviews, journals, LDP coaching session	- LDP (pre and post) - LDP coaching session - Interviews (pre and post) - Written Reflections - Verbal reflections on calls - Observation field notes	- Constant comparative analysis: open to analytical coding. Research questions guide creation of categories, and I will look for emergent categories - ATLAS Ti to analyze, code and synthesize transcriptions of the interviews
How does a faculty's developmental stage influence their orientation towards teaching and mentorship of students, curriculum design and their overall beliefs and values towards sustainability education and leadership development?	- Developmental stage - Participant describes influence on practices and perspectives - Demonstration of influence (or lack of) from interviews, journals, LDP coaching session	- LDP (pre and post) - LDP coaching session - Interviews (pre and post) - Written Reflections - Verbal reflections on calls - Observation field notes	- Constant comparative analysis: open to analytical coding. Research questions guide creation of categories, and I will look for emergent categories - ATLAS Ti to analyze, code and synthesize transcriptions of the interviews

Data Collection Methods

Data Collection Methods

Data collection methods include two rounds of semi-structured interviews, a pre- and post-developmental assessment, reflective journals, field notes and observations on the developmental coaching sessions, the workshop and conference calls that will take place as a part of the action inquiry process.

Semi-Structured Interviews

I will conduct two rounds of semi-structured interviews with each participant, at the beginning of the study and at the end. A semi-structured interview is a method of research used in the social sciences. While a structured interview has a rigorous set of questions, which does not allow the researcher to divert, a semi-structured interview is open, allowing new ideas to be brought up during the interview as a result of what the interviewee says.

The interviewer prepares an interview guide, which is an informal grouping of topics and questions that the interviewer can ask in different ways for different participants. Interview guides help researchers to focus an interview on the topics at hand without constraining them to a particular format. This freedom can help interviewers to tailor their questions to the interview context/situation, and to the people they are interviewing (Creswell, 2003).

In my two rounds of semi-structured interviews, I will meet via phone or skype for up to 90 minutes with each participant. I will ask for their permission to record the interviews and explain that the interviews will be kept confidential although they will be shared with my

committee and a transcriber if I use one. I will use a series of open-ended questions guided by my research questions. In the first round of interviews I will seek to elicit participants' perspectives and practices in relation to sustainability education and leadership development, mentorship, curriculum design and teaching practices and any prior knowledge and experience they might have about adult development and their application to sustainability education and leadership development, mentorship, curriculum design and teaching practices. In the second round of interviews, I will seek to elicit participants' experience of learning about adult development, participating in a developmental assessment and coaching session, the developmental workshop and further action inquiry reflective learning process. I will also inquire into any changes in their perspectives and practices regarding sustainability education and leadership development, mentorship, curriculum design and teaching practices and the influence on and application of adult development to these areas of practice (See Appendix F for more detail).

I will strive to insulate my observations from my own biases and worldview. By writing down my observations and interpretations I will be able to reflect upon them and look for potential distortion from my worldview. I recognize that I cannot be completely objective, however, and that my methodology cannot be fully differentiated from who I am. Additionally, I am going into this study with anticipated findings, as noted below. These come from my experience studying developmental psychology and adult learning, sustainability education and leadership. Rather than ensuring completely pure observations, I will trust that the data is "confirmable." This means that it can be tracked to its sources and that I use explicit and implicit logic to build my interpretations from it (Erlandson, et al., 1993).

After the interviews are completed I will assign each file a pseudonym that will keep the identity of each interviewee confidential. The interviews will be recorded digitally, labeled with pseudonyms that maintain the confidentiality of the interviewee and transcribed using Dragon Speak software or through the services of a professional transcriber. After each interview I will also document salient issues and questions that arose for me.

SCTi MAP

The SCTi-MAP (also known as the Leadership MAP and LDP), (Cook Greuter, 2006; Torbert, 2003, 2004) is a test comprised of 36 sentence stems that participants were invited to complete and submit for careful scoring. The SCTi-MAP is a projective technique, with sentence stems that deal with self-perceptions, social situations, and interpersonal relationships. The sentence stems enable participants to project their frame of reference into the incomplete sentences, while partially restricting the domain of the answers (Loevinger, 1979, 1998b). The structure of the language is assessed as much as the content of the sentences. This psychometric instrument and the scoring system used to evaluate it has proven to be reliable in helping to determine a person's developmental "center of gravity," (Cook-Greuter, 2006), their most available and consistent way of constructing the meaning of their experience (See Appendix E for more detail).

Unlike others tools, the SCTi-MAP makes significant and subtle distinctions of the later stages of adult development. It identifies an individual's main developmental stage or action logic. This is the level from which an individual habitually makes sense of their experience and the world. The profile points to someone's unique strengths and vulnerabilities, their fallback positions and concerns, as well as areas of major challenge, and potential for personal growth.

The SCTi-MAP is one of the latest versions of the Washington University Sentence Completion Test (WUSCT; Loevinger & Wessler, 1970). Over 4 decades, the WUSCT has been extensively refined and validated (Cohn & Westenberg, 2004; Hauser, 1976; Loevinger, 1979; Manners & Durkin, 2001), and has been revised several times (Cook-Greuter, 1999; Hy & Loevinger, 1996). It is one of the most frequently used measures of human development (Bartunek, et al., 1983; Cohn & Westenberg, 2004; Cook-Greuter, 1999) and carefully validated personality assessments available today (Torbert, 2003). The following sections discuss the validity of the WUSCT, followed by an explanation of how the instrument will be used in this study.

The SCTi-MAP “measures” cognitive, affective, and behavioral aspects of being. A SCTi-MAP final rating indicates the subject’s overall ego stage or action logic, or their highest, consistently available mode of functioning.

Participants will complete a SCTi-MAP after the first round of interviews. It takes about 45-60 minutes to complete the online instrument. These will be scored by a certified scorer and participants will receive their results shortly after completing the test. Each participants’ developmental assessment will be kept confidential by assigning a pseudonym to the file. Participants will then be invited to receive thirty minutes of developmental coaching by a certified coach. I will listen in to these calls and make field notes.

Participants will complete a second SCTi-MAP after 6 months of action inquiry. The re-test will take place before the second round of interviews, but participants won’t receive the results until after the interviews are completed.

Validity. Construct validity refers to “the extent to which an operationalization measures the concept it is supposed to measure” (Bagozzi, Yi, & Phillips, 1991, p. 421; Cook & Campbell,

1979). The WUSCT is a structural developmental measure, meaning that it is assessing the developmental stage of a psychological structure. The validity of such measures are typically difficult to assess using classic principles (Cronbach & Meehl, 1955) because of the complex relationship between behavior and the underlying psychological structures (Loevinger, 1993). Despite this challenge, the WUSCT “has demonstrated impressive construct validity... [and] is arguably the most extensively validated projective technique” (Lilienfeld, Wood, & Garb, 2000, p. 56). The WUSCT is considered a well validated projective technique because it aggregates scores across multiple items, contains ambiguous stimuli relevant to the construct being assessed, and employs an iterative approach to progressively improving the test (Lilienfeld, et al., 2000). The subsequent sections discuss the reliability and various dimensions of validity (substantive, convergent, discriminant, predictive and incremental) of the WUSCT (for comprehensive reviews see Cohn & Westenber, 2004; Hauser, 1976; Loevinger, 1979; Manners & Durkin, 2001).

Reliability. An instrument is considered reliable if repeated measurements produce consistent results (Pedhazur & Schmelkin, 1991). For projective techniques like the WUSCT, reliability is based upon interrater agreement and participant response (Redmore & Waldman, 1975). In multiple studies across diverse populations, the WUSCT has consistently demonstrated high interrater reliability (Loevinger, 1979; Manners & Durkin, 2001). Significant correlations were also found in studies of test-retest, equivalent forms, internal consistency, split-half, and pretest-posttest scores (Novy, Blumentritt, Nelson, & Gaa, 1997; Novy & Francis, 1992; Redmore & Waldman, 1975; Weiss, Zilberg, & Genevro, 1989). The WUSCT was found to be vulnerable to lower retest scores over short intervals due to decreased motivation (Redmore & Waldman, 1975). It has been found to be virtually impossible to contrive a result on the

WUSCT. Experiments have shown that persons almost never succeed in producing a protocol at later action-logic [stage] from their own, even after the theory underlying the scoring procedure has been explained to them. (Redmore, as cited in Torbert & Associates, 2004, p. 212)

Substantive validity. A measurement instrument has substantive or content validity when it includes items that accurately reflect the conceptual definition of the construct domain (Schwab, 1999). The WUSCT has had to overcome two key challenges in demonstrating this, but has done so successfully. First, Loevinger's concept of the self that progresses through ego development (the framework upon which the WUSCT is based) needed to be demonstrated to be theoretically coherent and of a unitary nature. Multiple studies (Broughton & Zahaykevich, 1988; Labouvie-Vief, 1993; Noam, 1993) which challenged these qualities were not successful in demonstrating otherwise (Loevinger, 1984; Loevinger, Wessler, & Redmore, 1970). Other studies took a different tack and tried to identify subsets of factors to Loevinger's concept of the self (e.g., moral or responsibility items); yet these, too, were unsuccessful. Thus, ego development has been determined to be a single construct.

The second challenge for ego development as related to substantive validity was the issue of sequentiality. Establishing sequentiality for a developmental theory is critical to establishing substantive validity (Loevinger, 1993, 1998b). Multiple longitudinal studies – ranging from adolescents to young adults to adults – have delivered sufficient support for the sequentiality of ego development stages (Adams & Fitch, 1982; Loevinger, et al., 1985; Manners & Durkin, 2001; Martin & Redmore, 1978; Redmore & Loevinger, 1979; Westenberg & Gjerde, 1999). Other studies have demonstrated that ego development has asymmetry of comprehension, meaning that people can understand a stage earlier than their own, but not stages much later than

their own (Loevinger, 1993, 1998b; Redmore, 1976). This also supports the case for sequentiality.

Convergent validity. An instrument has convergent validity when there is high correspondence among multiple approaches to measuring the same construct (Schwab, 1999). It is challenging to examine threats to the convergent validity of the WUSCT because of its unique nature. Nonetheless, five studies have provided significant support for the convergent validity of ego development (Manners & Durkin, 2001). These studies examined correlations between the WUSCT and alternate measures for ego development. The studies included unstructured interviews (Lucas, 1971; Sutton & Swensen, 1983), the Thematic Apperception Test (Sutton & Swensen, 1983), a California Q-sort of personality descriptors derived from ego stage milestones (Rozsnafszky, 1981), a California Q-sort of personality variables expected to be related to ego stage (Westenberg & Block, 1993), and longitudinal comparisons with the revised California Psychological Inventory (Helson & Wink, 1987).

Discriminant validity. An assessment instrument successfully demonstrates discriminant validity when it is shown that its results are not highly correlated with the results of other assessments that measure theoretically different concepts (Campell & Fiske, 1959). The three variables that have been used to challenge the discriminant validity of ego development are verbal fluency, intelligence, and socioeconomic status (Hauser, 1976; Loevinger, 1979; Manners & Durkin, 2001).

Action Inquiry Reflective Learning Process

Participants were guided through an action inquiry learning process to learn about adult development and its application to sustainability education, leadership development and

teaching, mentorship and curriculum development. The learning process started with completing the developmental assessment, receiving the results and participating in thirty-minute developmental coaching sessions. Next I offered a developmental workshop to faculty and students in separate workshops. The workshop included an overview of the action logics/ego-development model of adult development and its application to sustainability education, leadership development and teaching, mentorship and curriculum development. Emphasis was placed on experiential learning and discussion about the model and its application. Following the workshop, faculty and student participants, (again in separate groups) engaged in a reflective learning process over the course of 5 months months. This included hour-long conference calls every three week, occasional one on one calls, limited readings and reflective journaling. (For more detail see Appendix H).

Observations and Field Notes

I took field notes after the interviews, during the developmental coaching sessions, the developmental workshops and action inquiry process. These notes will serve as an additional form of data and as a means of triangulation (Maxwell, 2005). This triangulation using multiple data collection methods might provide stronger substantiation of the constructs that I will employ and any hypotheses that I may generate.

Through my observations I seek additional insight into how participants experience and make meaning of the developmental perspective and its application to their own personal and professional development, sustainability education, leadership development and teaching, mentorship and curriculum design. Field notes will also be a potential validity check on the assumptions I hold and the meaning I make of participants' experiences and perspectives.

Protection of Human Subjects

Each participant will be informed of the study purpose, approach, and what to expect. This includes how their data will be collected, stored, used, with whom it may be shared, and overall confidentiality. They have a right to know this without ambiguity (Seidman, 1991). All participants will sign an informed consent form. The collected data will not be available to any member of the public; only those involved in my scholarship at Prescott College will know details about the study. I will use pseudonyms in all files and subsequent writings to protect participant identity and data. No comments, examples, or other information indicative of identity will be published without explicit participant approval. Participants have the right to remove themselves from the study at any time, without repercussions. In such a case, I will cull and destroy all related data. Participants may ask questions at any time or discuss reservations until any issues are resolved. Data will be collected via audio recordings and transcribed by myself, or an external transcription service that has signed a confidentiality form (Appendix G). All data will be kept within password-protected computer files.

Data Analysis and Synthesis

The data set includes the pre and post interviews, journals, SCTi-MAP coaching session, pre and post SCTi-MAP results and field notes. Interviews were transcribed by a professional transcriptionist. I then reviewed and correct the transcriptions, which also served as my first in depth review of the data. I will also use the ATLAS-Ti software to assist my data organization and analysis.

For the qualitative part of my mixed methods design, I will use a constant comparative method for data analysis. This method was first proposed by Glaser and Strauss (1967), as a means for developing grounded theory. However it is also used widely in qualitative research as a general approach for inductive and comparative data analysis (Merriam, 2009, p. 175).

In the first phase of the data analysis, I will begin coding the data and seek categories based on the research questions. The interview transcriptions, field notes, and journals will be reviewed throughout the data gathering process. I will start with an open coding as I review the journals, field notes and transcriptions for the first time, writing notes, observations and questions in the margins. As I review the data for the second time, I will begin an analytical coding process. Analytical coding goes beyond descriptive coding in that it is “coding that comes from interpretation and reflection on meaning (Richards, 2005, p.94). At this stage I will begin grouping the codes into categories. The research questions will guide the creation of categories, however I will also be looking for emergent categories. I will look at each set of data independently as well as looking for themes that emerge when comparing the pre- and post-interview transcriptions, early and late journals, early and late field notes etc. Initially the themes will be guided by my sub-questions, which seek to qualitatively assess and understand participants’ experiences of learning about developmental stages, their own development, and applying the actions logics model to their teaching and mentorship in sustainability education and leadership development. Additionally I will be looking for how a participant’s developmental stage influences how they approach sustainability education, teaching and mentorship and how this changes throughout the six-month study period. Additional sub-questions may emerge in the interviews, as well as additional themes that may become evident from the interview transcriptions. After creating the initial system of categories, I will again review the data using these categories to find any additional data to assign to these categories (with the assistance of the data analysis software) and to assess the categories themselves and revising them as needed.

The transcriptions, journals and notes will be coded using the themes/sub-questions as categories for coding, as well as potentially emergent themes. I will also use a coding software (Atlas-ti or Nvivo) to support the coding and sorting of the data.

For the quantitative part of the study, the data that is collected from the SCTi-MAP protocols will be compared to determine any differences between the first and second protocols. In addition I intend to do a group analysis of faculty and students separately, by adding the total weighted score of each person, and dividing by the number of participants in each group. This will give an average score or stage for both the students as a whole and the faculty, as well as the average increase or decrease in the scores. (Terri's comments: You will also have your quantitative rendering from your MAP's which given a numeric score based on research using Bayes theorem or the Rasch probability scales. That will be automatic for you when you get the scoring back, and then you can do the numeric comparisons (this is what makes your project a mixed methods project...you have both a qualitative and a quantitative project). (More to be developed here)

Anticipated Findings and Trustworthiness

I expect that there will be a diversity of responses among participants to the developmental framework. I expect that some of this response will be influenced by the individual's developmental stage. Later stages (strategist and beyond) may be more interested and able to work effectively with the complexity of the model and its application. However, individuals assessed at the developmentally earlier Achiever stage may also find value and be interested in the model. Individuals assessed at Individualist (and potentially construct aware) may not be interested, and/or resistant to the hierarchical dimensions of the model.

I expect that there will be a range of commitment among participants to the action inquiry process and that the degree of involvement will affect the degree of impact learning about a developmental model will have on the participant, and therefore the research results.

I expect that the students may be more open and responsive to learning about the developmental framework than faculty. I anticipate that some of the faculty may be participating to support me as their student, and may not be significantly invested in the learning process, which will likely have an effect on the outcome of the research.

I don't expect much difference between the SCTi-MAP scores of the pre- and post-test, given that there is only 6 months between each of these protocols.

I do expect differences in the ways that people approach teaching, mentorship, curriculum design, sustainability education and leadership, based on their developmental differences (more on this).

Internal Integrity

My research is an exploratory study of integrating a developmental perspective (knowledge, awareness and experience) into higher education for sustainability education and leadership development. It may reveal that doing so supports the personal and professional development of students and faculty and has the possibility of advancing sustainability education, sustainability leadership and adult learning practices. As such, I must make every effort to ensure credibility. This section details the potential internal integrity threats to this study and my strategies to counteract or minimize them. I first address my biases and assumptions, followed by discussion about reactive, descriptive, and interpretive threats.

Researcher Bias

I am very familiar with the theoretical constructs of adult development (Cook-Greuter, 1999; Kegan, 1982; Torbert, et al., 2004). I am also a student in Prescott's PhD program. The student participants are colleagues, and are either members of my own doctoral cohort or of the cohort directly before or after mine and the faculty involved, have been my faculty. I need to not allow my assumptions or hopes to inappropriately color or reinterpret participants' statements and my observations. As much as I strive to be neutral and objective, my subjectivity cannot be removed from this epistemological equation.

My strategy to counteract this is threefold. 1) Be transparent about this threat to myself and my dissertation committee. I will ask for feedback and expect them to challenge me on this issue as needed. I will stay aware of this threat, especially noticing when my own assumptions, connections or judgments influence my interpretations. 2) Write memos to identify and objectify the emotional, mental, or other internally-sourced influences that may arise. Such objectification of my subjective assumptions is central to transforming them (Kegan, 1994). 3) Monitor the change in these assumptions throughout the study. These notes that document my relationship with these biases may become valuable data for the study.

Reactivity

Reactivity refers to the potential impact I may have on a participant's behavior because of the awareness of being studied (Neuman, 2006). I intend to use reactivity productively rather than attempt to minimize or eliminate it. This begins with recognizing that I will always influence the participant during the interviews, workshop and other related action inquiry processes. The questions I ask direct their attention and inquiry. They will pick up on my conscious or unconscious responses and presence, and adjust according to their worldview. I may generate reactivity by the very fact of being a student of theirs (with the faculty), or a

colleague or cohort member of the students. I will strive to be mindful of when and how I may be influencing them, and attempt to modulate accordingly. Before each interview I intend to create an environment in which they feel comfortable to express themselves fully. I want them to be honest and for their experience to take precedence over mine (Maxwell, 2005). Throughout our interactions, I will work to maintain a welcoming, non-judgmental inter-subjective state.

Descriptive Integrity

My description of the data needs to be accurate. I will be rigorous in my attention to the details and process of data collection. The interviews will be digitally recorded and transcribed verbatim. I will listen to each, while reading the transcription, to verify their accuracy.

Interpretive Integrity

I need to ensure that another researcher might have similar interpretations of the data. As Maxwell (2005) recommends, I will consistently look for ways that my interpretations and conclusions may not accurately express the data, or might be better explained from another perspective. Additionally, I will strive to strengthen the interpretive integrity by integrating data from the SCTi-MAP scores, the literature review, the interviews, the journals, my reflective notes, and discussions with my committee members.

Limitations and Delimitations of the Study

This section identifies the limitations and delimitations of this research. It addresses aspects of the research design, including sample size, sampling procedure, instrumentation, and the impact of my personality and subjectivity.

Sample Size

This study is exploratory and focused on a specific context. As such it has a small sample size of 12 participants. This sample is not sufficient to make generalizations about the impact of

introducing a developmental perspective into other academic contexts or to other faculty and students in graduate sustainability education and leadership development programs. It is sufficient, though, to gather initial data about the impact of this learning process on this particular group of faculty and students, as well as to point towards future research questions.

Sample Procedure

My sampling procedure also creates limitations. Rather than have a random sample of students and faculty from Prescott College, participants are self-selecting, which suggests a potential interest in the focus of the research and the learning process.

Instrumentation

The SCTi-MAP assessment, while rigorously validated (Cook-Greuter, 1999), also presents limitations. It is one lens on a human. It does not indicate the degree of mental health, social adjustment, or subjective well-being of an individual (Hy & Loevinger, 1996). I believe all of these can affect how sustainability educators approach their teaching, mentoring and curriculum design. Other assessments also strive to measure meaning-making structure such as the subject-object interview (Kegan, 1982, 1994; Lahey, et al., 1988). The subject-object interview and the corresponding developmental framework developed by Kegan (1982, 1994) therefore provides an alternative perspective on maturity. Finally, there are aspects of other developmental lines, psychological states, and personality typologies that indicate developmental maturity (Wilber, 2000). Therefore this study only offers a small slice of insight into the complexity of the participants.

Other Limitations to discuss (self as researcher, Short time frame of study, SCTi-MAP Re-test so close to learning about the framework – might elevate the results, Structure of the action inquiry process and my capacities and strategies for teaching about development)

Summary

In this chapter I detailed the major steps and dimensions of my research methodology. In summary, a mixed-methods approach is most appropriate for this exploratory study on integrating a developmental perspective into a post secondary program in sustainability education and leadership development. For data collection, I use a pre and post assessment of participants' meaning-making structure and pre and post semi-structured interviews, journals from an action inquiry process and observation field notes. Comparative thematic analysis guides my interpretation of the data. Finally, I identified the internal integrity threats to this study, detailed my strategies to address them, and conclude with an overview of limitations.

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Appendixes

- A. IRB proof
- B. Consent Letter
- C. Invitation for Participation in the Research
- D. Research Invitation Addendum
- E. Copy of the MAP questions
- F. Interview Protocol
- G. Transcriptionist Confidentiality Form
- H. Action Inquiry Process

Appendix A IRB Proof**HIPAA Documentation**

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that Abigail Lynam successfully completed the NIH Web-based training course “Protecting Human Research Participants”.

Certification Number: 515446

Appendix B Consent Form

Research on integrating an adult developmental perspective into teaching, mentorship, and learning for sustainability education and leadership development.

NAME OF PARTICIPANT: _____

You have been asked to participate in a research study conducted by Abigail Lynam, a doctoral student in Prescott College's PhD in Sustainability Education program. This study is supervised by Rick Medrick. The focus of this research is to explore the impact of integrating a developmental perspective (constructive development theory) into teaching, mentorship, and learning for sustainability education and leadership development. You are being asked to participate in this study because you are either PhD or MAP faculty, or a student in the PhD program.

Before you agree to participate in this research study, it is important that you read and understand the information provided in this informed consent form. If you have any questions, please ask the researcher for clarification.

Why Is This Study Being Done?

The overarching purpose of the research is threefold: to highlight the importance of worldviews, psychology and self-identity in learning, teaching and facilitating transformative change, to explore deepening the transformative nature of learning and leadership development in graduate education through the use of a developmental framework and assessment, and to contribute to advancing the application of adult developmental research to higher education and adult learning. The results of this research will be relevant in the following areas: adult learning, transformative learning, post-secondary education, adult development, sustainability education, and leadership development.

How Many People Will Take Part In The Study?

Up to 15 participants.

What Is Involved In The Study?

Should you choose to participate, the research will take place over a six-month time frame, starting towards the end of June, 2013 for students and in August, 2013, for faculty. Participants will be interviewed at the beginning and end of the 6 months, using a semi-structured interview method via Skype. Shortly after the first interview, participants will take an assessment called the SCTi-MAP Professional Sentence Completion Form (also called the LDP). For this, you complete 36 sentence stems in writing. It takes 60 minutes and you can do it anytime. Certified scorers will score the assessments and results will be kept confidential and known only to the participant and the researcher.

Following the assessment, participants will receive their results and 30 minutes of developmental coaching by a certified coach. Next, participants will learn about adult development and its application to teaching, mentoring, sustainability education, and leadership

development by participating in two, 2-hour video conference calls (for students), and a half day workshop August 23rd for faculty or in an online webinar if needed.

For the ensuing 6 months, participants will engage in an action inquiry process to continue to learn about, experiment with application, and reflect on their experience of learning about adult development. This will take the form of 1 hour conference calls or skype calls (once a month), journaling with reflection questions, and occasional readings. At the end of the 6 month cycle, participants will retake the SCTi-MAP Professional Sentence Completion Form, engage in a second round of interviews, and receive the results of their SCTi-MAP after the interviews are complete. The total time commitment required for participation will be between 15 and 20 hours.

How Long Will I Be In This Study?

The study will take place over 6 months. The total time commitment on your part is 15-20 hours.

What Are The Risks Of The Study?

The risks to you are considered minimal. It is possible that taking the SCTi-MAP developmental assessment and receiving your results could create some emotional discomfort. While this is rarely the case, it does happen occasionally. Any concerns or discomfort can be addressed during the developmental coaching with a certified coach. Additionally discussing this topic (not your results which are kept confidential to you, the certified scorer and the researcher) could bring up some emotional challenges. Should you experience such discomfort, I will provide a list of counseling services and therapists that you can contact.

What Are The Benefits To Taking Part In This Study?

Participating in this research may offer an opportunity for personal and professional development. It can serve as a tremendous opportunity to learn about yourself, your students, and how your teaching and mentorship can be modified to meet your students right where they are, as well as supporting them to take their next developmental steps. It may also provide insights and strategies for meeting Prescott's PhD objectives, as well as offering tools and strategies for the development and impact of the sustainability field in general.

Attuning to development can help educators more effectively mentor their students to engage with more complexity, to reflect with greater depth of inquiry, to be aware of and integrate more perspectives in their approach to sustainability education, and to engage in transformative doctoral research and scholarship. Capacities that are considered foundational for sustainability education and transformative scholarship naturally emerge as someone moves along the developmental trajectory. Understanding stage development and how to teach and mentor in developmentally supportive ways can be an important tool for Prescott's Sustainability Education PhD program and the sustainability education and leadership field generally.

Participants will gain understanding of the constructive developmental framework and its application to transformative teaching and learning, and facilitating transformative change. Participation also offers the opportunity to explore its strengths and challenges, and to think critically about the application of a developmental framework to adult learning and a graduate sustainability education.

What about Confidentiality and Protection?

Study related records will be held in confidence. Names of participants will be changed so that the data can be viewed by the researcher, supervising faculty and possibly a research assistant (for transcription), with your identity protected.

The information you provide will be kept strictly confidential. The informed consent forms and other identifying information will be kept separate from the data. All materials will be kept in password-protected computer files on the laptop and back-up media of Abigail Lynam. The interview recordings will be listened to only by the Researcher and possibly a confidential Research Assistant (a transcriptionist), who has signed the attached Professional Assistance Confidentiality Agreement.

You will be assigned a different name for any quotes that might be included in the final research report. If any direct quotes will be used, permission will be sought from you first. The results of this research will be published in Abigail Lynam's dissertation and possibly published in subsequent journals, books or presentations.

The security of data transmitted over the Internet cannot be guaranteed, therefore, there is a slight risk that the information you send to Abigail Lynam via email will not be secure. The collection of such data is not expected to present any greater risk than you would encounter in everyday life when sending and/or receiving information over the Internet.

Participation in Research is Voluntary

You are free to decline to participate or to withdraw from this study at any time, either during or after your participation, without negative consequences. Should you withdraw, your data will be eliminated from the study and will be destroyed. The researcher is also free to terminate the study at any time.

Compensation

No compensation will be provided for participation.

Study Results

You may request a copy of the summary of the aggregate final results by indicating your interest at the end of this form.

Additional Information

If you have any questions about any aspect of this study or your involvement, please tell the Researcher before signing this form. You may also contact the supervising faculty if you have questions or concerns your participation in this study. The supervising faculty has provided contact information at the bottom of this form. You may also ask questions at any time during your participation in this study.

This informed consent form has been provided to you electronically, via e-mail or in person. Please print out one copy of this form and sign it, indicating you have read, understood, and agree to participate in this research. Keep this record for your files. Then please reply to the researcher via e-mail that you have read, understood, and agree to participate in the research. If you would like a copy of the study results, please also indicate this to the researcher in your

reply. The Institutional Review Board of Prescott College retains the right to access to all signed informed consent forms and other study documents.

I have read the above informed consent document and have had the opportunity to ask questions about this study. I have been told my rights as a research participant, and I voluntarily consent to participate in this study. By signing this form, I agree to participate in this research study. I shall receive a signed and dated copy of this consent.

Longitudinal Study Permission

It is likely that I will continue this study in the future and may want to contact you 1-2 years after this particular study is complete for follow up. Please initial here if you are open to being contacted in the future.

_____ Initials giving consent for contact in the future regarding follow up research

NAME OF PARTICIPANT (please print)

SIGNATURE OF PARTICIPANT

DATE

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Appendix C Invitation for Participation in the Research

March 14th, 2013

Dear Prescott Graduate (Faculty or Students)

I am writing with great excitement to invite you to be a participant in my doctoral research. The focus of my research is to explore the impact of integrating a developmental perspective (constructive development theory) into teaching, mentorship, and learning for sustainability education and leadership development. I have chosen Prescott College's Masters and PhD programs as a case study for my research and am inviting participation from faculty, administration, and PhD students. After you have read my invitation, I would love to follow up with a phone call to discuss any questions you might have. I need to know by March 22nd at the latest if you wish to participate. Your participation in my research is tremendously helpful for me and will hopefully be of value for you.

The overarching purpose of my research is threefold: to highlight the importance of worldviews, psychology and self-identity in learning, teaching and facilitating transformative change, to explore deepening the transformative nature of learning and leadership development in graduate education through the use of a developmental framework and assessment, and to contribute to advancing the application of adult developmental research to higher education and adult learning. Emerging research in adult development from the last 40 years has significant implications for teaching, learning, and transformative leadership development. Understanding and working with adult development can support the personal and professional development of educators and students. It offers insight into working with the diversity of perspectives, learning needs, and meaning making structures in a cohort of students (colleagues and/or stakeholders in a sustainability initiative), and can be considered a form of internal systems thinking. It can also serve as a tool for communication strategies, the design of sustainability initiatives and curriculum design. Adult development also sheds light on the transformative learning process.

Constructive-Developmental Theory

The constructive-developmental framework for ego development was originally created by Jane Loevinger (1970) and expanded upon by William Torbert (Torbert, et al., 2004), Susanne Cook-Greuter (1999, 2004), and Terri O'Fallon (2011). Ego development includes self-identity, meaning making structures, and cognitive, behavioral and emotional development. Overall, the leadership development framework and its associated assessment tool, the Leadership MAP, describes nine ways of adult meaning making. It refers to stages as *action logics* because it focuses on how adults tend to reason and behave in response to their experiences.

Research Design

The research will take place over a six-month time frame, starting towards the end of April, 2013. Participants will be interviewed at the beginning and end of the 6 months, using a semi-structured interview method over the phone or via Skype. Shortly after the first interview, participants will complete a developmental assessment using the Leadership MAP (see below for more information). Certified scorers will score the assessments and results will be kept confidential and known only to the participant and the researcher. Following the assessment, participants will receive their results and 30 minutes of developmental coaching by a certified coach. Next, participants will learn about adult development and its application to teaching, mentoring, sustainability education, and leadership development by attending a half-day workshop directly after the May PhD symposium or in an online webinar if needed. For the

ensuing 6 months, participants will engage in an action inquiry process to continue to learn about, experiment with application, and reflect on their experience of learning about adult development. This will take the form of conference calls or skype calls (every three weeks), journaling with reflection questions, and occasional readings. At the end of the 6 month cycle, participants will retake the Leadership MAP, engage in a second round of interviews, and receive the results of their MAP after the interviews are complete. The total time commitment required for participation will be between 15 and 20 hours.

(Depending on participants' schedules, the research with faculty might start at the beginning of the summer, with the workshop directly before or after the August orientation. This decision will be based on the scheduling constraints and needs of faculty)

Research Question

What happens when a developmental perspective (including knowledge and awareness of development) is introduced in a post secondary program in sustainability education and leadership development?

- How does awareness of and knowledge about development influence the practices and perspectives of sustainability educators?
- What are the personal and professional influences on students and faculty?

Potential Value for Research Participants

Participating in this research may offer an opportunity for personal and professional development. It can serve as a tremendous opportunity to learn about yourself, your students, and how your teaching and mentorship can be modified to meet your students right where they are, as well as supporting them to take their next developmental steps. It may also provide insights and strategies for meeting Prescott's PhD objectives, as well as offering tools and strategies for the development and impact of the sustainability field in general.

Attuning to development can help educators more effectively mentor their students to engage with more complexity, to reflect with greater depth of inquiry, to be aware of and integrate more perspectives in their approach to sustainability education, and to engage in transformative doctoral research and scholarship. Capacities that are considered foundational for sustainability education and transformative scholarship naturally emerge as someone moves along the developmental trajectory. Understanding stage development and how to teach and mentor in developmentally supportive ways can be an important tool for Prescott's Sustainability Education PhD program and the sustainability education and leadership field generally.

Participants will gain understanding of the constructive developmental framework and its application to transformative teaching and learning, and facilitating transformative change. Participation also offers the opportunity to explore its strengths and challenges, and to think critically about the application of a developmental framework to adult learning and a graduate sustainability education.

The Leadership MAP Assessment Tool

The Leadership MAP (also known as SCTi-MAP or the LDP) is the most widely-used, highly validated, and reliable of developmental assessments (Cook-Greuter, 1999; Torbert, et al., 2004). Unlike others tools, the Leadership MAP makes significant and subtle distinctions of the later stages of adult development. The Leadership MAP identifies an individual's main stage or action logic within The Leadership Maturity Framework. This is the level from which an individual habitually makes sense of their experience and the world. The profile points to someone's unique strengths and vulnerabilities, their fallback positions and concerns, as well as areas of major challenge, and potential for personal growth.

The assessment is a projective technique, consisting of 36 sentence stems that deal with self-perceptions, social situations, and interpersonal relationships. The sentence stems enable participants to project their frame of reference into the incomplete sentences, while partially restricting the domain of the answers (Loevinger, 1979, 1998b). The structure of the language is assessed as much as the content of the sentences.

Testimonies from Participants in Pilot Study

In a mentored course during my second year of study, I invited fellow students in cohort 6, PhD faculty and course mentors to take the Leadership MAP and to participate in a half-day workshop about the developmental perspective.

“I gained a lot from becoming aware of my own developmental level – it resonated with me in a way I would not have expected and helped me better understand my own ways, inner complexity, and orientation toward work.” Nicky

“At first I was resistant to developmental models. However, I feel like it has made me more compassionate and open to opinions and worldviews that are very different from mine. Rather than feeling disconnected because of the labels and categories, I actually feel more connected.” Jenny

“Doing the MAP assessment was really a good experience for me. It gave me a better understanding of myself, my own thought processes, and understanding of the people around me. It is helping me understand others’ perspectives, where they are, and their ability to take perspectives.” Kerri

Appendix D Addendum to the Research Invitation

Appendix D

Addendum to the Research Invitation

This addendum includes more detail about the application of a developmental perspective to teaching, mentorship and sustainability education, and additional resources for further reading.

A Developmental Perspective and its Relationship with Sustainability, Teaching and Learning

“Sustainability is as much about the mindset through which the world is seen, as it is about the activities taken in support of it”

~Cynthia McEwen & John Schmidt

There is a growing recognition in the sustainability field, that our abilities to navigate the converging, complex challenges that we face, are dependent on our capacities and skills to work well together across multiple scales, to sustain ourselves and our work, and to work adaptively and transformatively, envisioning solutions that are global in scope and locally appropriate and sustainable. Self-identity, worldviews, values, emotional intelligence, and the behaviors that arise from these, play a significant role in the impact we have on the planet and one another. Increasing our focus on these interior dimensions of individuals and collectives can complement and improve the effectiveness of sustainability education and initiatives. Emerging research in the field of adult development offers some significant insights for cultivating capacities and skills in the realm of mindsets and worldviews.

In the field of sustainability education, we understand how critically important it is to bring to bear the best of human knowledge and wisdom (from our ancient histories and future awareness), and to work systemically to integrate the needs and values of society, ecology, and economics in our work towards creating a better world for all. We understand the need to have many well-developed strategies and tools for cultivating ecological and social literacy, systems thinking capacities and values development. However, a more overlooked piece of the puzzle is paying more attention to the interior systems (learning needs, worldviews, etc.) of ourselves as educators, our students and/or our community members and stakeholders. One size definitely doesn't fit all, and no matter how well we teach or facilitate learning process, if we don't cultivate a deeper understanding of who our students are, where they are in their developmental journeys, and what their learning needs are, then our well thought out designs and learning experiences may not work as well as we hoped, or may generate resistance and confusion, more than transformation and understanding.

Turning our attention more deeply to our own and our students' interiors (psychology, worldview, values) can have a profound effect on who we are as educators and how effective and transformative we are in mentoring our students, collaborating with our colleagues, and facilitating transformative change. A developmental perspective is a form of internal systems thinking and can be a profound tool for teaching, learning, and leadership.

To be clear, looking at someone's cognitive, affective, and behavioral development – through the development of self-identity – is only one aspect of who a person is. There are many ways of understanding someone, including various typologies (gender, learning style, introvert/extrovert, etc), the cultural and family contexts they grew up in, the uniqueness of their personality and so on. This particular approach to understanding individuals and collectives is one of many approaches and can be a useful and potentially transformative tool.

Taking a developmental perspective is paradoxical. Many fear that it is another form of an oppressive hierarchy, of boxing another and judging them for who they are and aren't. These concerns are critically important and must be addressed. Paradoxically, I have found the developmental framework to be profoundly liberating and more honoring and deeply respectful of others, exactly *as* they are and in terms of what they value and believe, while also aware of their developmental potential (where they might be headed next), than any other educational framework (such as types of learners, etc). That's why I like to refer to it as a developmental embrace. And to address and take fully into consideration the concerns that are raised, it's critical to hold the framework lightly (it's theoretical and therefore is partial in its view), to remember that the developmental stages are types in people, rather than types of people, and that as my mentor Terri O'Fallon often says, someone's developmental stage is more like their skeleton, while their full being and their uniqueness is the whole body – the skeleton plus the organs, muscles, ligaments, vascular systems, skin, etc.

Potential Benefits of a Developmental Perspective

A developmental perspective can be valuable in some of the following ways:

- Aware that an individual's development influences their perspective on sustainability and experience of the curriculum, faculty can be more sensitive and discerning about who their students are and their developmental needs.
- Teaching about development and its connections to sustainability value systems or worldviews can support students to take a meta-perspective on the field and learn to navigate and work effectively with a diversity of value systems and meaning making structures, and it highlights some of the ways the field itself can further develop.
- Supporting students' cognitive, behavioral and affective development can support the development of capacities and skills that Prescott College identifies as important for Sustainability Education. These include capacities to work well with a diversity of perspectives, engage with complexity and paradox, develop capacities for self-reflection, critical thinking and self-awareness, and approach sustainability work in interdisciplinary and transdisciplinary ways. It can also support students to move from 'conviction to curiosity' and from 'ideologies to ideas that work' (Pramod Parajuli).
- Awareness of one's own development and the development of students can generate a greater flexibility and adaptive approach to mentorship and teaching – cultivating a dynamic balance between direct teaching and encouraging student directed learning. This includes transcending the dichotomy between "sage on the stage and guide on the side"; finding a dynamic way to include both and discern when one is needed more than the other.
- An understanding of development highlights the importance of integrating interiors (values, worldviews, psychology, subjective perspectives and experiences) in our teaching through practices such as dialogue, other ways of knowing, contemplative practices, reflection, shadow work, etc. These are seen as a complement to empiricism, understanding complex systems, and their role in sustainability challenges and solutions etc.

Additional Resources to further explore constructive development theory

- JSE paper: Navigating a Geography of Worldviews
http://www.jsedimensions.org/wordpress/content/navigating-a-geography-of-sustainability-worldviews-a-developmental-map_2012_03/

- Chapter 5 in Palmer, P. J., et al. (2010). *The heart of higher education: A call to renewal*. Boston: Jossey-Bass.
- Drago-Severson, E. (2009). *Leading adult learning*. New Haven: Corwin Press.
- “Applying Constructive-Developmental Theories of Adult Development to ABE and ESOL Practices”, Helsing, Drago-Severson and Kegan, pdf available at:
http://www.ncsall.net/fileadmin/resources/ann_rev/rall_v4_ch5.pdf

Appendix E THE SCTi Sentence Completion Test

Professional Sentence Completion Form SCTi-MAP (Please note: formatting is different for electronic form)

© scg web 2006

Dr. Susanne Cook-Greuter

Assessment and Coaching, for Personal and Professional Excellence, and Well-Being

The Leadership Maturity Framework (LMF) refines and expands Loevinger's Ego Development Theory. The LMF integrates Bill Torbert's model of Personal and Organizational Transformation with Susanne Cook-Greuter's ongoing research in Adult Development and the assessment of personal maturity and transformational leadership capacity.

Certified scorers analyze your responses to this form in multiple ways. They then create your unique Leadership Development Profile. The SCTi-MAP identifies your center of gravity or action logic within The Leadership Maturity Framework. This is the level from which you habitually make sense of your experience and the world. The profile points to your unique strengths and vulnerabilities, your likely fallback positions as well as your areas of greatest challenge and potential for growth and personal transformation.

The SCTi-MAP is the most highly validated and reliable of existing, developmental assessments. Unlike other measures, the SCTi-MAP makes powerful and subtle distinctions at the high-end of the developmental spiral.

Directions for completion

- The following three pages contain thirty-six sentence beginnings of various kinds. Please just finish each sentence. There are no right or wrong answers.
- Allow yourself at most forty-five minutes of private time to finish the form at one sitting.
- After each response, use the tab key or cursor to move to the next form field.
- This document will be treated with the highest confidentiality. Please respond spontaneously and honestly.
- Make sure that your contact information is completed on this page and that your initials and date of completion (but not your name) are entered on all other pages.
- Please save the form and your responses on your system. When finished, return a copy of your test as an email attachment to:
MAP@Cook-Greuter.com

Your details for return of the profile packet

Name

Position

Organization

Address

City, State, Zip

Phone
Cell

Email

First language

Please provide the following data for ongoing research and development of this instrument. Thank you.

Your gender Your age Education (highest degree)

Your Initials Date

36. 36 Raising a family

2 When I'm criticized

3 Change is

4 A man's job

5 Being with other people

6 The thing I like about myself is

7 My mother and I

8 What gets me into trouble is

9 Education

10 When people are helpless

11 Women are lucky because

12 A good boss

13 A girl has a right to

14 The past

15 When they talked about sex, I

16 I feel sorry

- 17 When they avoided me
- 18 Rules are
- 19 Crime and delinquency could be halted if
- 20 Men are lucky because
- 21 I just can't stand people who
- 22 At times s/he worried about "S/he" should be read as "she" by women, "he" by men
- 23 I am
- 24 If I had more money
- 25 My main problem is
- 26 When I get mad
- 27 People who step out of line at work
- 28 A husband has a right to
- 29 If my mother
- 30 If I were in charge
- 31 My father
- 32 If I can't get what I want
- 33 When I am nervous
- 34 For a woman a career is
- 35 My conscience bothers me if
- 36 Sometimes s/he wished that S/he" should be read as "she" by women, "he" by men

SCTi MAP Sentence Completion Test continued.

*The instrument*¹

The current professional LDP/SCTi has 36 sentence stems printed on two and a half pages. It has minimal instructions: "I would like you to fill out this sentence completion

form. You see that these are incomplete sentences. Please complete each sentence in the space provided to the best of your ability.” The recommended time allotment is between 30 and 45 minutes.

The LDP/SCTi is currently administered in several forms:

1. 1) The best practice for rigorous research is to administer the test in a group setting which guarantees that the time limit is respected and that no other people are involved in producing the completions,
2. 2) However, given Internet technology, individual clients often use an electronic form. It can be downloaded, filled in by using the tab key and writing responses in the given space. Finally, the test can be emailed back as an attachment. A benefit for research of this method of data gathering is that the data is already in computer readable form and does not need to be transcribed. The disadvantage is that the researcher has no control over whether the participant follows the instructions or not.
3. 3) The SCTi is also occasionally given orally or by phone in research with populations who are unable to use either of the two other formats or because they are illiterate or infirm.
4. 4) The LDP/SCTi is unisex. It has manuals for all items. Sometimes, two separate but identical forms are administered except for the pronouns he or she are used depending on whether the test taker is male or female. The unisex form can split in half for pre-post test purposes.

Scoring manuals

Original manuals were based on protocols of about 1200 women, half used for the construction phase, half used for refinement and development of the measuring tool. The current manual is based on thousands more and updated to reflect current sentiments and conventional beliefs. The high-end stages and criteria are based on an additional sample of 4500 protocols. Occasionally, Dr. Cook Greuter adds new stems, although the development of manuals for new stems is extremely difficult and time consuming.

Special forms and instructions

The form developed by Torbert and Cook Greuter in 1984 was geared toward adults working in organizations, and they now recommend the 36 item form in all professional contexts for statistical reasons. With simpler instructions, post conventional subjects often respond from a conventional, functional point of view, not from their most complex level of understanding or making meaning. Therefore, slightly modified instructions are helpful in some contexts: “Finish these sentences to the best of your understanding or to the best of you ability.” This is meant to signal to individuals to go beyond merely cursory or functional replies.

Appendix F Interview Protocol

Research Questions

What happens when a developmental perspective (including knowledge, awareness of development and experience of a developmental assessment) is introduced in a post secondary program in sustainability education and leadership development?

Subquestions

- How does awareness of and knowledge about development influence the practices and perspectives of sustainability educators?
- What are the personal and professional influences on students and faculty?
- What is the developmental impact of learning about adult development?
- How does a student's developmental stage influence their experience and learning in Prescott College's sustainability education PhD program and their perspectives, research interests and activities/behavior with regards to sustainability?
- How does a faculty's developmental stage influence their orientation towards teaching and mentorship of students, curriculum design and their overall beliefs and values towards sustainability education and leadership development?

Interview I: Pre-LDP and Introduction of a Developmental Perspective

Welcome:

Thank you for agreeing to participate in this study. As you know I am exploring the impact of introducing an adult developmental perspective (including knowledge, awareness of development and experience of a developmental assessment) in a post secondary program in sustainability education and leadership development?

I will limit my comments during the interview because I really want to hear what you have to tell me. However, if at any point you want more information or clarification on any point, please do not hesitate to ask.

With your permission, I will digitally record this interview. The purpose of the recording is two-fold: first, so that I can accurately capture what you share; and second, so that I do not have to write extensive notes, which will allow me to fully listen to what you are telling me. I may jot some notes down here and there just simply as reminders to myself. The recording will remain confidential. Only fellow researchers and myself will have access to the tape. After the interview is over, I will have the tape transcribed and will forward it to you so that you can review it for accuracy.

As I continue to go further with the interviews and analyze the data, with your permission, I would like to contact you for clarification and /or to ask additional questions that may arise in later interviews.

Do you have any questions before we begin?

Do you have any need for clarification on anything that has been said?

If you have any questions at any time please ask me.

Interview:

Warm Up

Do you feel settled and prepared for the interview?
 Are you comfortable with skype calls and the video format? Is the sound clear?
 Is there anything I can do to make you more comfortable?
 When you first got the invitation to participate in this study, what came to your mind?
 Do you have any questions before we begin?

Intention of Interview

I want to remind you that the purpose of this study is to explore impact of introducing a developmental perspective (including knowledge, awareness of development and experience of a developmental assessment) in a post secondary program in sustainability education and leadership development? Because this interview is taking place before the introduction of the developmental model, my questions won't address a developmental perspective.

Interview Questions

1. 1. Tell me about your approaches to sustainability education? How do you define sustainability? What do you value in sustainability education? What do you tend to include and not include?
2. 2. What is your perspective on the overarching intent, values, objectives and goals of the PhD in Sustainability Education program?
3. 3. Have your definitions or approaches changed in the last few months or years? If so, how?
4. 4. What are your research interests in the sustainability education field? What are your newly emerging interests?
5. 5. What kind of sustainability education activities and organizations are you involved with?
6. 6. Can you describe how you approach curriculum design, teaching and mentoring?
7. 7. Tell me about your experience as a student in the PhD program. What have you loved, valued, disliked and/or struggled with?
8. 8. How might your views and values differ from other students and faculty in the program?
9. 9. Are there ways that you draw on or integrate a developmental perspective in your sustainability education work?
10. 10. How might a student's developmental stage influence their experience and learning in a program like Prescott College's sustainability education PhD program?
11. 11. How might a faculty's developmental stage influence their orientation towards teaching and mentorship of students, curriculum design and their overall beliefs and values towards sustainability education and leadership development?
12. 12. Is there anything I have not asked you that I should?
13. 13. Is there anything else you would like to add?

Conclusion:

Thank you for your generosity of time, for your insights, for your openness. If anything else comes up for you after the interview, please let me know.

Interview II

Intention of Interview

I want to remind you that the purpose of this study is to explore impact of introducing a developmental perspective (including knowledge, awareness of development and experience of a developmental assessment) in a post secondary program in sustainability education and leadership development? During this interview I will be asking you about your experience of learning about the adult developmental model, and your experience of participating in the study. Please be honest with me and don't hesitate to share critical thoughts or feelings. I really want to know what your experience has been.

Interview Questions

1. 1. What was it like for you to learn about adult development (personally and professionally)?
 - a. a. How did you experience the process of taking the LDP, receiving your results and the developmental coaching?
 - b. b. What was it like for you to participate in the action Inquiry process?
 - c. c. Do you feel you learned enough about this model of adult development to start applying in your personal and professional life? How so?
2. 2. How has the developmental perspective influenced or informed your approach or perspectives on:
 - a. a. teaching and mentorship
 - b. b. sustainability education in general
 - c. c. your research focus
 - d. d. the overarching intent, values, objectives and goals of the PhD in Sustainability Education program
 - e. e. the diversity of perspectives among students and faculty in the program?
 - f. f. anything else?
3. 3. Have there been any personal impacts as a result of learning about development and participating in this study?
4. 4. Can you imagine drawing a developmental perspective or approach in your:
 - a. a. Sustainability education work?
 - b. b. Teaching, mentorship, curriculum design?
 - c. c. Leadership?
 - d. d. Communication with fellow students and colleagues?
5. 5. How might a student's developmental stage influence their experience and learning in a program like Prescott College's sustainability education PhD program?
6. 6. How might a faculty's developmental stage influence their orientation towards teaching and mentorship of students, curriculum design and their overall beliefs and values towards sustainability education and leadership development?
7. 7. Is there anything I have not asked you that I should?
8. 8. Is there anything else you would like to add?

Conclusion:

Thank you for your generosity of time, for your insights, for your openness. If anything else comes up for you after the interview, please let me know.

Appendix G Transcriptionist Confidentiality Form**Professional Assistance Confidentiality Agreement**

Title of Project: Integrating a Developmental Perspective into Adult Learning, Sustainability Education and Leadership Development

Name of researcher and affiliation with Prescott College: Abigail Lynam, student

I have agreed to assist Abigail Lynam in her research study on adult development and sustainability education in the role of transcriptionist.

I understand that all participants in this study have been assured that their responses will be kept confidential and anonymous. I agree to maintain that confidentiality and anonymity. I agree that no materials will remain in my possession beyond the operation of this research study. I further agree that I will make no independent use of any of the research materials from this project.

Signature _____

Date _____

Printed Name _____

Title _____

Appendix H Action Inquiry Process

For the purposes of the research, participants have been asked to commit up to 20 hours over a six-month period. This was requested to provide some time for learning about and engaging with the application of a developmental perspective to teaching, mentorship and sustainability education and leadership development. During the six months, there will be five cycles of learning (sessions), with three weeks for each cycle/session, each of which includes an action logic focus, readings, questions to guide the reflective journaling and an hour long conference call.

Session 1

- Action Logic: Expert – Application to Sustainability Education and Teaching/Mentorship
- Reading:
 - o Expert Action Logic Overview
 - o Cook-Greuter, S. R. (2005). Ego development: Nine levels of increasing embrace. Retrieved at <http://www.cook-greuter.com>
 - o O'Fallon, T. (2011). StAGES: Growing up is waking up--interpenetrating quadrants, states and structures. Retrieved from: http://www.pacificintegral.com/docs/StAGES_OFallon.pdf
- Reflection Questions
 - o What is it like to learn about your own development?
 - o How has learning about your *own* development influenced your thinking about sustainability education, teaching and mentoring?
 - o How might an individual with an Expert action logic approach sustainability education and leadership? What kind of mentorship might support individuals at this stage of development and their next steps developmentally?

Session 2

- Action Logic: Achiever– Application to Sustainability Education and Teaching/Mentorship
- Reading:
 - o Achiever Action Logic Overview
 - o Drago-Severson, E. (2008). 4 practices serve as pillars for adult learning: Learning-oriented leadership offers a promising way to support growth. *The Journal of Staff Development*, 29(4), 60-63.
 - o Helsing, D., Drago-Severson, E. & Kegan, R. (2001). Applying Constructive– Developmental Theories of Adult Development to ABE and ESOL Practices. Retrieved at http://www.ncsall.net/fileadmin/resources/ann_rev/rall_v4_ch5.pdf
- Reflective Questions
 - o How might your understanding the development of others influence how you approach to sustainability education, teaching and mentoring?
 - o How might an individual with an Achiever action logic approach sustainability education and leadership? What kind of mentorship might support individuals at this stage of development and their next steps developmentally?

Session 3

- Action Logic: Individualist– Application to Sustainability Education and Teaching/Mentorship
- Reading:
 - o Individualist Action Logic
 - o Lynam, A. (2012) Navigating a Geography of Sustainability Worldviews: A Developmental Map. Journal of Sustainability Education. Retrieved at http://www.jsedimensions.org/wordpress/content/navigating-a-geography-of-sustainability-worldviews-a-developmental-map_2012_03/
 - o McEwen, C. A. & Schmidt, J. D. (2007). Leadership and the corporate sustainability challenge: Mindsets in action, Retrieved from <http://ssrn.com/abstract=1118071>
- Reflective Questions
 - o How might an individual with an Individualist action logic approach sustainability education and leadership? What kind of mentorship might support individuals at this stage of development and their next steps developmentally?
 - o What are your insights, questions and concerns about adult development and its application to Sustainability Education and Teaching/Mentorship?

Session 4

- Action Logic: Strategist– Application to Sustainability Education and Teaching/Mentorship
- Reading:
 - o Strategist Action Logic
 - o Brown, B.C. (2012). *The Future of Leadership for Sustainability – Part One and Two*. Kosmos Magazine, Fall/Winter.
- Reflective Questions
 - o How might an individual with a Strategist action logic approach sustainability education and leadership? What kind of mentorship might support individuals at this stage of development and their next steps developmentally?
 - o What might a developmental perspective offer the field of sustainability education and leadership development?

Session 5

- Action Logic: Construct Aware – Application to Sustainability Education and Teaching/Mentorship
- Reading:
 - o Construct Aware Action Logic
 - o Cook-Greuter, S. & Sharma, B. *Polarities and Ego Development: Polarity Thinking In Ego Development Theory And Developmental Coaching*
- Reflective Questions
 - o How might an individual with an Construct Aware action logic approach sustainability education and leadership? What kind of mentorship might support individuals at this stage of development and their next steps developmentally?
 - o How has this learning process affected you personally and professionally?
 -

¹ The description of the LDP/SCTi is taken from the scoring manual by Susann Cook-Greuter (2006)