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# THE CULTURE OF LEARNING AND RATIONALITY

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**Abstract:**

The United Nations' campaign to generate a new development paradigm seeks to engage the largest global human diversity ever to collaborate in global policy formulation. In the campaign, education is recognized as the "engine" to empower "groups" of populations that have had little history of participating in the policy process. While the methodology of educating is under debate, little attention is being given to the root cause of rationality, which is the construction of systematic thought. This article compares three alternative knowledge development methodologies to the mainstream method being spread globally and their influence in cultivating a sustainability mindset: the mission of the United Nations "education for sustainable development" initiative. The previously published article on "The Education of Sustainable Development Laboratory" (2015), describes an opportunity to use the pending campus-wide redevelopment process of the University Laboratory School (Hawai'i) as a research project on knowledge development frameworks to establish a world leading design of education for sustainable development.

**Keywords:** *education*; *sustainable development*; *learning*; *rationality*

## LA CULTURA DEL APRENDIZAJE Y LA RACIONALIDAD

**Resumen:**

La campaña de Naciones Unidas en pro de un nuevo paradigma del desarrollo busca involucrar la mayor diversidad humana a nivel global de todos los tiempos para colaborar en la formulación de la política global. En la campaña, se reconoce a la educación como el "motor" para empoderar "grupos" de poblaciones con poca historia de participación en el proceso político. Si bien la metodología educativa es objeto de debate, se está prestando poca atención a la raíz de la racionalidad, que es la construcción del pensamiento sistemático. Este artículo compara tres metodologías alternativas para el desarrollo del conocimiento con el método convencional extendido globalmente y su influencia en el cultivo de una mentalidad de sostenibilidad: la misión de la iniciativa de Naciones Unidas "educación para el desarrollo sostenible". El artículo previo sobre "La educación de laboratorio de desarrollo sostenible" (2015) describe la oportunidad para usar el pendiente proceso de reconstrucción a nivel de campus de la Escuela Laboratorio de la Universidad de Hawái como un proyecto de investigación sobre marcos de desarrollo del conocimiento para establecer un diseño mundial líder de educación para el desarrollo sostenible.

**Palabras clave:** *educación*; *desarrollo sostenible*; *aprendizaje*; *racionalidad*

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## 1. Introduction

According to Robert M. Pirsig in his book *"Zen and the art of motorcycle maintenance"* (1974, p. 94), "but to tear down a factory or to revolt against a government [...] because it is a system is to attack effects rather than *causes*; and as long as the attack is upon effects only, no change is possible. The true system, the real system, is our present *construction of systematic thought* itself, rationality itself, and if a factory is torn down but the rationality which produced it is left standing, then that rationality will simply produce another factory. If a revolution destroys a systematic government, but the systematic patterns of thought that produced that government are left intact, then those patterns will repeat themselves in the succeeding government. There is so much talk about the system. And so *little understanding*" [1].

Albert Einstein's statement "*we can't solve problems by using the same kind of thinking we used when we created them*" echoes Pirsig's quote from his book. Both authors suggest that creating any paradigm for reform, such as educational reform, requires a new way of thinking. Kuhn (1962) directs us to question the assumptions behind the theories if problems can no longer be solved under the operating scientific paradigm.

Therefore this paper conveys an attempt to explore for possible assumptions underlying our educational policies that may influence the learning outcome. Since a knowledge development framework guides learning, perhaps different frameworks may influence different outcomes. To test this theory, a comparison is made between four various frameworks of knowledge development to examine the "construction of systematic thought" and determine if there is any difference between the "causes" or outcomes in supporting the notion of sustainability.

In relationship to the most conducive framework for cultivating a sustainable development mindset, the most beneficial framework would be one that motivates students to become engaged with the learning process at high participatory and ownership levels. The framework could also encourage "systems thinking", "critical thinking" and intuitive abilities.

In a co-authored previous article in this review (Peel and Peel 2015), the author described an opportunity to use the pending campus-wide redevelopment process of the *University Laboratory School* (Hawai'i) as a research project on knowledge development frameworks to establish a world leading design of education for sustainable development. This paper expands on the knowledge development framework aspect outlined in that one.

## 2. The culture of Learning and Rationality

Pirsig hypothesized that there is a prevailing thought pattern behind human rationale created by the "systematic method of thinking". As a standardized public education system is the major influence that shapes the rationality of the citizens it produces (Fogelin 2001; Feinberg and Soltis 2009; Dornhaus 2010; Fresco 2011; Cherry 2013; Gallup 2013), many questions related to education come to mind in light of globalization and the increasing global issues facing humanity. So:

- *Could the dominant economic rationality originate with the mainstream learning practices, therefore continue to resist progress towards achieving the objectives of Agenda 21?* (e.g. USA's boycott of 2002 World Summit on Sustainable Development).

- *As education spreads into undeveloped countries, will these societies shift their cultural values to replicate the values associated with the unsustainable (industrial) paradigm?* (e.g. Hawaiian traditional sustainable resource practices replaced by the western development approach has created an unsustainable dependency on importing resources).

- *Does the dominant educational model lead students to question the underlying assumptions or do people learn to merely become the receptors of information that causes them to replicate or perpetuate an unsustainable paradigm?*

- *Are standardized tests measuring cognitive development that has the ability to induce the shift to a sustainable development paradigm or merely reinforcing the practices that perpetuate the present paradigm?*

[1] Emphasis in concrete words is made by the author of this paper.

*- To what degree are children influenced to function as responsive, caring, and cooperative citizens in a democratic society when educated in the competitive authoritarian environment of the schooling system?*

*- Is the dominant systematic approach to research generating "truth" for everyone's reality, or could the knowledge perpetuate a falsehood or an illusion of truth?*

*- Are people educated in an unsustainable or artificial environment less responsive to conflict-free and sustainable practices?*

*- Which research methodology or knowledge development approach provides the best framework to design educational reform to transform the global society into a united, ecological conscious, benevolent, and collaborative community (sustainable paradigm)?*

## 3. Knowledge development frameworks

Most of the former questions appear to be addressed under a global shift to a sustainable development paradigm. Assuming programs designed at the laboratory schools guide national curriculum development, addressing the last question may provide a research agenda towards designing the best "education for sustainable development" model.

This paper reviews four contemporary knowledge development or research methodology frameworks (Table 1) to examine how they relate to Agenda 21 prescriptions for strengthening the role of three "major groups": women, children and youth, and indigenous peoples.

One aspect conveyed by the international community related to "strengthening the major groups" is increasing their level of participation in policy development. The low participation rate of these groups could relate back to the paradigm shift that occurred in the Neolithic Age where the male's physical strength became a preferred asset to the survival of a community (Eisler 1987). This may be a "cause" underlying the persisting male-dominated "globalization" rationality.

Therefore, inclusion of these three major groups, at an equitable level, offers an approach to alter the present rationality. Women possess birthing and nurturing traits *–social strength–* (Eisler 1987), indigenous people are recognized as more attuned with an environmental sensitivity *–environmental strength–* (Geertz 1973, Gegeo 1994, Young 1998, Snively and Corsiglia 2001) and children and youth offer innovativeness from their higher level of genius and less judgemental perspectives *–social strength–*.

The school system offers an effective mode of leverage to engage these three groups to influence a shift toward a sustainable paradigm. Therefore testing the method of construction of systematic thought of the education system has a potential to shed light on its influence associated with participatory levels of these major groups. This would be a significant role for the Laboratory Schools that design and test programs on representative student populations. The University Laboratory School (ULS-Hawai'i) provides an opportunity to apply it to the redevelopment process they are facing to rebuild the ULS campus.

Table 1 provides a simple comparison of four different frameworks of knowledge development by using the table of contents of each publication. From this comparison, similarities can be detected between 3 of the frameworks, whereas McGaa's framework deviates the most dramatically. The descriptions below assess each framework in more detail.

Accepting that W. Lawrence Newman is defining a mainstream approach to knowledge development in his book *"Basics of Social Research: Qualitative and Quantitative Approaches"* (2007), this review will offer a baseline to compare it to other frameworks. His influences have been his American education and a background in Asian studies.

To frame the basics of social research when introducing his book, Neuman (2007) states: "social research is a process in which people combine a set of principles, outlooks, and ideas (i.e., methodology) with a collection of specific practices, techniques, and strategies (i.e., a method of inquiry) to produce knowledge. It is an exciting process of discovery, but it requires persistence, personal integrity, tolerance for ambiguity, interaction with others, and pride in doing quality work".

**Table 1.** Framework comparison of research methodologies for knowledge

| Neuman (2007) | Morris (2006) | Kirby et al. (2006) | McGaa (2004) |
|---|---|---|---|
| ▪ Foundations: Doing Social Research | ▪ Positivist paradigm: engagement- entree to the research setting | ▪ Why do research? | ▪ Wisdom through observation Lesson of Eagle |
| ▪ Foundations: Theory and Social research | ▪ Positivist paradigm: assessment- development of understanding of the research focus | ▪ Where do you stand? Locating the research and the researcher | ▪ Find and preserve the medicine Lesson of Bear |
| ▪ Foundations: Ethics in social research | ▪ Positivist paradigm: planning- rationales for carrying out the research project | ▪ Working together | ▪ Balance in all things Lesson of Lion |
| ▪ Foundations: Reviewing the scholarly literature and planning a study | ▪ Positivist paradigm: implementation-gathering the data | ▪ Planning the project: developing a research design | ▪ One among many Lesson of Wolf |
| ▪ Foundations: Qualitative and Quantitative measurement | ▪ Positivist paradigm: evaluation- developing an understanding of the data and its meaning | ▪ Planning the project: research ethics and preparing the proposal | ▪ Develop intuition Lesson of Orca |
| ▪ Foundations: Qualitative and Quantitative sampling | ▪Positivist paradigm: termination and follow-up reporting on findings and exiting the research setting | ▪ Searching the literature | ▪ Seek truth Lesson of Owl |
| ▪ Conducting Quantitative Research: Survey research | ▪ Post Positivist paradigm: assessment and engagement- development of understanding of the research focus and entree to the research setting | ▪ Operationalizing the research question | ▪ Strive for freedom Lesson of Tiger |
| ▪ Conducting Quantitative Research: Experimental research | ▪ Post Positivist paradigm: planning, implementation, evaluation- rationales for gathering data, data gathering, and developing an understanding of the data and its meaning | ▪ Developing skills as a data gatherer | ▪ Heat<br>Lesson of Cottonwood tree – seeking wisdom to deal with global warming |
| ▪ Conducting Quantitative Research: nonreactive research and secondary analysis | ▪ Post Positivist paradigm: termination and follow up-reporting on findings and exiting the research and communicating and distributing the findings | ▪ Gathering data and data management | ▪ Thin<br>Lesson of Deer – seeking wisdom to deal with the thinning ozone layer |
| ▪ Conducting Quantitative Research: Analysis of quantitative data | ▪ Critical theory: Assessment, engagement, and planning-development of understanding of the research focus, entree to the research setting, rationales for carrying out the research | ▪ Analyzing data and reporting | ▪ Gone<br>Lesson of Buffalo – seeking wisdom to deal with species extinction |
| ▪ Conducting Qualitative Research: Field research | ▪ Critical theory: Implementation- gathering data | ▪ Conclusions | ▪ Too many<br>Lesson of Rat – seeking wisdom to deal with overpopulation |
| ▪ Conducting Qualitative Research: Historical – comparative research | ▪ Critical theory: Evaluation- developing an understanding of the data and its meaning | | |

*Continues...*

**Table 1.** Framework comparison of research methodologies for knowledge *(continuation)*

| Neuman (2007) | Morris (2006) | Kirby et al. (2006) | McGaa (2004) |
|---|---|---|---|
| ▪ Conducting Qualitative Research: Analysis of qualitative data | ▪ Critical theory: Termination and follow up-reporting findings, exiting the research setting, and communication and distribution of research findings | | |
| ▪ Writing a Research Report | ▪ Constructivism: Engagement, assessment and planning-entree to the research setting, development of understanding of the research focus, rationales for gathering data | | |
| | ▪ Constructivism: Implementation and evaluation-gathering the data and developing an understanding of the data and its meaning | | |
| | ▪ Constructivism: Termination and follow up-reporting on findings, exiting the research setting, communication, and distribution of findings | | |
| | ▪ Cross-Cutting Themes: Ethics, Diversity, and Technology: The ethics and politics of research | | |
| | ▪ Cross-Cutting Themes: Ethics, Diversity, and Technology: the researcher's responsibility to diversity | | |
| | ▪ Cross-Cutting Themes: Ethics, Diversity, and Technology: the function of technology at each step of the way | | |

Source: Own elaboration from quoted contributions

Under the heading of "the three major approaches to social science", this author also introduces the concept of multiple or competing paradigms in several fields of social science, which he claims some researchers find a hindrance to the growth of knowledge. He points out there is a difference of opinion among social scientists over multiple paradigms and describes three major paradigms or approaches to social science that affect "how people do social research studies". He also indicates there are variations (internal divisions, offshoots, and extensions) within each of these paradigms.

Specifically, Neuman (2007, p. 42) states that "positivism" is the method most used in North America. This originated with the physical sciences. The method assumes "reality is made up of objective facts that *value-free*_researchers can precisely measure and use statistics to test causal theories" [2]. Replicating results by collecting quantitative data is the focus in the positivist approach.

[2] Emphasis in concrete words is made by the author of this paper.

The "interpretative" paradigm is a qualitative assessment of what is believed to be real. These beliefs can change over time, making social reality "fluid". The interpretative researchers (Neuman 2007, p. 43) "...favour interpretative over casual forms of theory [...and] inductive reasoning not bound by laws" (positivism is explained by law-like principles or *nomothetic* statements). The objective is to understand how a person views, feels, and acts (empathetic understanding or *verstehen*). The "critical" approach assumes that there is an illusionary surface that is not reality and calls for action to advance social change through theory and deeper analyses (Neuman 2007 p.44).

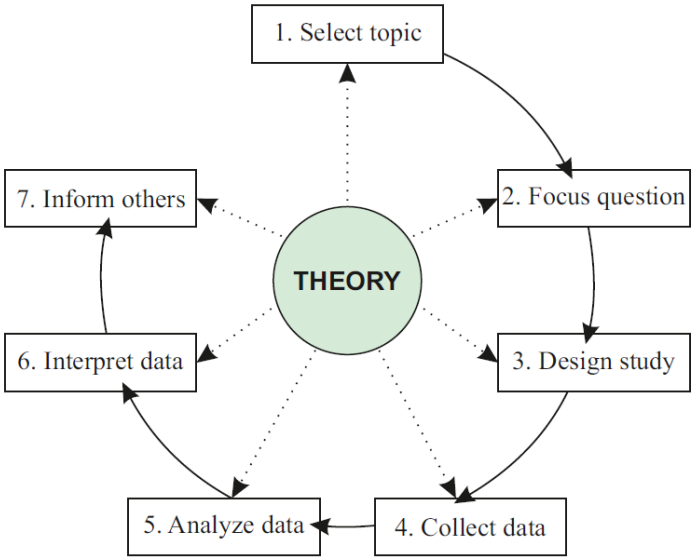
Neuman (2007, p. 41) refers to Thomas Kuhn's (1962) criticism on science: "that the way science develops in a specific field across time is based on researchers sharing a general approach or paradigm. A paradigm is an integrated set of assumptions, beliefs, models of doing good research, and techniques for gathering and analyzing data. It organizes core ideas, theoretical frameworks, and research methods. Kuhn observed that scientific fields tend to be held together around a paradigm for a long period of time. *Very few researchers question the paradigm*, and most *focus on operating within its general boundaries to accumulate new knowledge*. On rare occasions in history, intellectual difficulties increase, unexpected issues grow, and troubling concerns over proper methods multiply. *Slowly*, the members of a scientific field *shift* in how they see things and switch *to a new paradigm*. Once the new paradigm becomes fully established and widely adopted, the process of accumulating knowledge begins anew"[3].

Kuhn's idea also reflects Einstein's and Pirsig's descriptions of change (*paradigm = rationality*) which only happens if there is a need to shift to a new perspective (effect to cause), such as the conscious paradigm shift Agenda 21 calls for.

Neuman delineates a seven step research process. Each step is tied to theory as shown in Figure 1. Then he defines social theory "as a system of interconnected abstractions or ideas that condenses and organizes knowledge about the social world" (2007, p. 24), and lists Durkheim, Weber, Marx, and Tonnies as examples of classical social theorists that "laid the foundation for subsequent generations of social thinkers".

This author also states these classical theorists are "rare" innovative "geniuses". Neuman states true "serious social theory" takes many years of empirical tests, conducted and debated by "dozens of researchers" to be considered theory.

**Figure 1.** Steps in research process




Source: Neuman (2007, p. 10)

[3] Emphasis in concrete words is made by the author of this paper.

As Figure 1 suggests, Neuman contends "almost all research involves some theory"... and it comes down to the matter of "how you should use it".

To explain theory, Neuman follows the traditional scientific path of breaking down a system into components. He explains "all theories contain concepts, and concepts are the building blocks of theory" (2007, p. 26), and directs readers to refer to Chafetz, Hage, Kaplan, Mullins, Reynolds, and Stinhcombe for further information. He also states "social theory requires well- defined concepts" and "a valuable goal of exploratory research, and most good research, is to clarify and refine concepts" (2007, p. 27), describing concepts under the categories of "concept clusters", "classification concepts", "scope", "assumptions", and "relationships".

This author then refers to the "aspects of theory" as "baffling" since theory comes in many forms (not conducive to linear thought processes). To simplify the understanding of theory, he constructs a linear and hierarchical description under the following categories: i) the direction of its reasoning; ii) the level of social reality that it explains; iii) the forms of explanation it employs; and iv) the overall framework of assumptions and concepts in which it is embedded. Under the direction of reasoning, deductive and inductive are the two basic directions of reasoning.

Neuman's categorizing theory, then divides the levels of social reality into micro, meso, and macro levels of theory depending on the size of the system being studied. To add another layer of complexity of theory, it is divided into forms of explanation differentiated as "prediction and explanation", "casual explanation", "structural explanation", and "interpretative explanation". Although he does not mention or qualify interpretative explanation when it comes to language translation, which is considered a major factor (Young 1998), he does expose the effect on interpretation that occurs due to differing disciplinary or functionality perspectives (corporate managers converting legal ideas, terms, and concepts to fit their organizational setting).

The overview of this mainstream framework, besides being "baffling", does not appear to be applicable for a society seeking transition given Neuman's qualification that "serious social theory" takes many years of empirical tests confined to "dozens of researchers" to be considered theory, especially when he qualifies the very nature of society as "fluid". Without any reference to include the missing cultural and demographics identified by Agenda 21 in the research body ("dozens of researchers"), or elsewhere in the publication, this framework does not appear to offer measures to broaden participatory parameters. In addition, an assessment of the referenced material of this publication indicates a predominant male influenced construction.

Teresa Morris' book *"Social work research methods: four alternative paradigms"* (2006) has been included in this the review as it appears to meet the objective of "strengthening the role of major groups" of Agenda 21 (chapters 24 and 25) by including American feminine and youth perspectives (reflected by her reference material). Morris's exposure to Hawaiian culture through her years at the University of Hawai'i may have influenced her research methods.

Namely, this author departs from Neuman's "three major approaches" as she borrows Guba's (1990) (education researcher) "positivism", "post-positivism", "critical theory", and "constructivism" paradigm categorization to compare the processes of each paradigm, then contending that research methods evolve with time and emphasizes there is a need to include alternative approaches to the common (positivist) approach. This is to expand to a world-wide perspective.

She emphasizes "that studies addressing social work practice confront ethical problems regarding withholding service to control groups, practical problems associated with random assignment of human beings to experimental and control groups, and methodological problems concerning the application of findings derived from a controlled experiment to the hurly burly world of social work practice" (Morris 2006, p. xiv), and also points out variations in the literature of determining causality, citing other sources, to conclude that, following Lincoln and Guba (1985), "we will never be able to accurately address causality with people in real world setting" (2006, p. xiv).

Morris (2006) points out that the education system does not emphasize the importance of developing penetrating questions. Pollack (2003) concurs with this view that illiteracy begins with the inadequacies of the educational system in the U.S.A, where the natural curiosity of a child is replaced by "a recitation of accomplishment. Science is presented as answers rather than questions" (p. 20). In other words, the pedagogy of primarily information transfer, filling students with facts to answer questions (standardized

tests), causes the production of scholars who lack the ability to ask questions sparked by an inquisitive mind. At the university level, science students "learn a lot about how, but little about why" (Pollack 2003, p. 20). This approach definitely restricts the students' participation level as they become more receptors of knowledge rather than engaged as interactive learners.

Morris also indicates that a great deal of research has been ineffective due to the tendency to spend inadequate time developing critical questions, and attributes this flaw to how the techniques of research are taught. She also views that social work research requires much more innovative approaches in view of the diversity social science faces. By detailing each paradigm, she believes that her book will offer the conceptual clarity to link different worldviews with different research questions requiring methodologies, achieving different goals when researching social work practice at the micro and macro levels of human organization.

Morris also justifies her approach by explaining the need to evolve research practice to take on a worldwide perspective and adapt with time. As she explains "positivism can test causal and correlational theories, but post-positivism can build theory and critical theory can promote action to address social injustice [...] constructivism offers the tools to comprehend and act on subjective knowledge and understanding" (Morris 2006, p. xi). She also relates the fact that most social work texts convey the positivist paradigm for doing scientific research, even though the assumptions of the methodology are not proven. This echoes Kuhn's observation that few researchers question the assumptions a paradigm operates on.

Morris's framework does appear to be fashioned from a wider perspective when comparing her referenced authors to those by Neuman's. The participatory parameters are expanded through the objective of the framework to take on worldwide and alternative perspectives. Her claim along the text that more time is needed to develop more critical questions places more of a demand to heighten the participatory level.

Sandra Kirby, Lorraine Greaves and Colleen Reed, in their book *"Experience research social change: methods beyond the mainstream"* (2006) deviate from the other mainstream scholarly publications by specifying the need to question "the monopoly that certain powerful groups hold over information" (p. 15). In addition, the bibliography is mainly made up of indigenous knowledge and feminine references. These aspects meet the objective of "strengthening the role of major groups" of Agenda 21 (namely in chapters 24, 25 and 26).

This publication highlights the transformation happening in social structures that are being reflected in the shift in the choices of research areas, methodologies, processes, and modes of knowledge transfer. It brings forth the notion that most people "have been excluded from participating in, describing and analyzing our own understanding of realty [... and then] research that does not reflect on and analyze the social context from which it springs serves only the status quo and does not enable us to interact with and change society [...,] research and knowledge are produced in a manner which represents the political and social interests of a particular group [..., and] research has often been a tool of domination which has helped perpetuate and maintain current power relations of inequality. Too often the experts who do the research have been well trained in patterns of thinking which not only conflict with their understanding, but explain and justify a world many are actually interested in changing" (Kirby and McKenna 1989, pp. 16-17).

Kirby et al. (2006) concur with the "critical theorist" and "constructivist" approaches described by Morris, detailing the need to establish the worldwide view by empowering the oppressed and challenging the underlying assumptions. This approach "attacks" the "cause" in the Pirsigian view and is the key objective of Agenda 21's "strengthening the role of majority groups" (women, children and youth, and indigenous peoples).

These three authors frame two interrelated research processes: on the one hand, the first of such processes requires "an authentic dialogue between all participants in the research process in which all are respected as equally knowing subjects" (Kirby et al. 2006, p. 7); on the other hand, the second one is a critical reflection on the participants' social reality.

This framework is specific to broadening the participation parameters, specifically to those outside of the influential segments of society.

Ed McGaa's book *"Nature's way: native wisdom for living in balance with the earth"* (2004) has been included as a perspective well-grounded in traditional indigenous knowledge. It should therefore relate to strengthening the indigenous orientated perspective of Agenda 21 (referenced in chapter 26). Even though McGaa has been educated on a regular schooling path, he is a Sioux tribal leader and has stayed involved in traditional cultural ceremonies. His research methodology framework may present a unique perspective in comparison to the mainstream and the other "western" alternative approaches.

To be precise, this author's framework reflects the development of intertwined knowledge from detailed observation of the natural world by the senses, intuitive powers, and understanding the inter-connectiveness of nature, as the source of truth.

The phenomenon of *cognitive dissonance* is addressed by McGaa's approach through reconnection to the natural laws and the development of intuitive abilities. He criticises international economic competitiveness, where nations strive to compete through the educational process. The "lesson of wolf", "one among many", addresses the need of all nations to work together as equals, toward collectively finding ways for global survival. This lesson is strongly reflected in the formulation of Agenda 21, which is the result of intensive international rationality and collaboration. McGaa's approach also addresses the four key international issues (climate change, ozone depletion leading to increased radiation levels, species extinction, and over population), which ultimately impact human survival.

This framework also expands the participatory parameters to a worldwide process addressing inclusivity, a consideration not highlighted in Neuman's mainstream approach (2007).

## 4. Conclusion and final remarks

Firstly, this comparison of the four research methodologies supports the hypothesis that there is a potential that the knowledge development framework has an influence on the educational paradigm. The level of participation appears to be a dependent variable. Neuman also supports this notion by elaborating on how social science theory poses challenges in providing a clear path to establish sound rationality. One of the problematic areas he mentions is that the mainstream approach has borrowed much from the physical sciences framework. His description of the varying opinions within the field by "geniuses", who he refers to and are all male, does not address a need to broaden the participatory level as a strategy to adjust the framework. Taking into consideration the "fluid" aspect of social parameters and the call for a paradigm shift by the international community, it becomes questionable if the mainstream framework will "cause" learning outcomes required to shift to a new paradigm.

The apparent dominant male perspective of the mainstream framework could be a reason that the frameworks described by the two publications, authored by females, bring out different perspectives. These perspectives highlight the importance of establishing a broader participatory approach for knowledge development. Morris emphasizes the need to establish a critical approach to understand the "why", while Kirby et al. emphasize the need to establish inclusive equity in knowledge development as it is now based on the power structure that dictates the research agendas. Kirby also echoes Pirsig's view of experts tending to resist progressive change through their fixed thought patterns. In comparison to Neuman, it becomes apparent that the Morris and Kirby et al. frameworks are more conducive towards an ESD through inducing higher levels of participation.

McGaa's framework is a radical divergence from the other three frameworks, emphasizing knowledge development's connection with nature and offering direct ways for knowledge development to respond to four global issues (climate change, ozone depletion, species extinction, and overpopulation). He offers the only framework that recognizes the role of intuition in knowledge development, which has a link to the rising popularity of "mindfulness" training for teachers. As his influence stems from traditional indigenous values, this framework does appear to stimulate a sustainable mindset. The well-known Hawaiian navigator Nainoa Thompson (2014) captures the relevance of intuition in his experience of open-ocean navigating when there is no intellectual guidance. This appears to be a traditional Hawaiian value that is diminished in the mainstream framework that is strictly focused on intellectual development. The intuitive aspect triggers a need to briefly mention the influence of "mindfulness" training as a method to usher in the sustainable development paradigm (Siegel 2012). Such an approach has the potential to induce higher levels of participation due to the increased amount of reflection (assessment related to self-actualization) involved.

Secondly, an area related to cognitive development that has been researched for decades is now becoming a recognized practice to increase levels of concentration and comprehension. This is the art of meditation. UCLA's Mindful Awareness Research Center is one of the university departments offering training in "*Mindfulness Awareness Practices* (MAPs)" (Siegel 2012). The research associated with the meditation practice is extensive and is mentioned here because of McGaa's reference on intuitiveness, an attribute associated with meditation. In addition, one of the ULS teachers has been trained to incorporate the mindfulness practice into the ULS's curriculum (Faure 2013). Assessment of the mindfulness approach is also a facet that can be studied under the ULS research scrutiny.

Thirdly, this examination of four frameworks suggests that different frameworks can influence learning outcomes. It appears that the King/Brownell framework (1966) still guides the ULS curricula. Their 1966 publication also recognized that the fluid state of society place shifting and competing demands on the educational process. Due to these factors they stated that curriculum development should be guided by the core disciplines, free from influential interest groups.

Engaging students in developing the curriculum while they learn in an environment of "liberal education" is an approach to counter such external influences (King & Brownell 1966). This approach echoes Dewey's education model of allowing children and youth to learn from their interactions as a community while providing an avenue to express and share their vision with the community. This is the basic approach being followed by the UN to create a sustainable development paradigm; a deliberate move to replace the dominant influence with a more equitable approach in formulating a vision of a future global community.

This cursory analysis on research methodologies suggests the McGaa framework is better suited for creating a sustainable mindset. The Hawaiian epistemology described by Dr. Aluli Meyer (2003) closely reflects McGaa's framework, therefore is an example of expanding the ULS's scope of research to assess frameworks. The research can assess frameworks applicability to various levels of child development from the early stage, to preparing teenagers for the work force or higher education, which "causes" the creation of a sustainable mindset.

The ULS has a significant opportunity to become a world leader in education for sustainable development while constructing a sustainable campus designed by a community-wide participating process.

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