

McGregor, S. L. T., & Volckmann, R. (2013). *Transversity: Transdisciplinarity in higher education*. In G. Hampson & M. Rich-Tolsma (Eds.), *Leading transformative higher education* (pp. 58-81). Olomouc, Czech Republic: Palacky University Press.

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# TRANSVERSITY: TRANSDISCIPLINARITY IN HIGHER EDUCATION

Sue L. T. McGregor<sup>1</sup> and Russ Volckmann<sup>2</sup>

### Introduction

The foundational knowledge gained in higher education circumscribes the lives of graduates; they never entirely outgrow this knowledge (Bruffee, 1998). This lingering intellectual legacy could become problematic if their higher education learning is only disciplinary-based, or at best multi- or interdisciplinary in nature. While these three approaches to organizing university learning are not wrong, they are not enough, given the nature and complexity of the problems facing humanity in the 21<sup>st</sup> Century. The contemporary university finds itself increasingly compartmentalized to the point that the fragmentation has undermined the ability of universities to respond effectively to the broader needs and demands of society (Duderstadt, 2005; Weislogel, 2007).

We need a new kind of higher education. Nicolescu (1997) concurred, stating that “the emergence of a new culture capable of contributing to the elimination of the tensions menacing life on our planet, will be impossible without a new type of education... the transdisciplinary

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<sup>1</sup> Professor, Faculty of Education, Mount Saint Vincent University, Halifax Nova Scotia, Canada

<sup>2</sup> Saybrook University; Executive Editor, *Integral Leadership Review*

evolution of education” (p. 2). *Trans* means to zigzag back and forth, to cross over, to go beyond, to transcend borders and boundaries. While interdisciplinarity is focused on blurring or dismantling the boundaries *between* disciplines (within the university system), transdisciplinarity (TD) strives to remove the boundaries between higher education *and* the rest of the world, to solve the problems of the world (Nicolescu, 1985). Indeed, Nicolescu (1985) believed that knowledge creation involves an integrated combination of: (a) disciplinary work at universities (monodisciplinarity); (b) scholarship between and among disciplines at universities (respectively, multi- and interdisciplinarity); and, (c) knowledge generation *beyond* academic disciplines and *across* sectors external to the university, at the interface between the academy and civil society (transdisciplinarity). All four approaches are needed, recognizing that “transdisciplinary research is clearly distinct from disciplinary [and multi-and interdisciplinary] research, even while being entirely complementary” (Nicolescu, 2005, p. 3).

Recognizing the 21<sup>st</sup> century conundrum and imperative of needing a new approach to higher education, Palacky University (Czech Republic) obtained European Union (EU) funding for a new School for Transformative Leadership, which is spearheading the *University for the Future Initiative* (Assenza, 2009), the impetus for this book. Notice that the title of the initiative is a university ‘for the future’, intimating universities will prepare students for ‘the future,’ not just for their individual futures. Scholars at the Palacky School for Transformative Leadership prepared a document outlining their vision of a university ‘for the future’ (Hampson & Assenza, 2012). This inspirational piece challenged contributors to this book to embrace a transformative educational philosophy as well as transformative research, teaching and learning. Hampson and Assenza believe their approach to higher education “interpret[s] the term ‘higher’ in its fullest sense” (2012, p. 7).

Hampson and Assenza (2012) drew on the leading edge concepts of complexity, integration, resilience, sustainability, and deep learning (including cross-sectoral learning). The latter concept (i.e., deep, cross-sectoral learning) inspired this chapter on transdisciplinarity, as did their suggestion of creating “new, small, adaptive ‘inter-spaces’ between higher education and other societal sectors” (p. 11). We contend that transdisciplinarity is the best way to create these inter-spaces to ensure deep, cross-sectoral learning and deep, complex, integrative knowledge generation to solve the problems facing humanity in the 21<sup>st</sup> century.

We especially believe that transdisciplinarity is a powerful tool for ensuring the “empowerment of higher education to be a catalysing force for

social transformation through direct, continuous engagement in communities... involving direct interaction with other societal actors” (Hampson & Assenza, 2012, pp. 6-7). They envisioned cross-sectoral learning happening “beyond the confines of higher educational institutions” (p. 9), in complex learning contexts. The latter would comprise the university as well as the community, education, business and government sectors. In the spirit of their vision of ‘higher’ education, we now share an overview of transdisciplinarity as understood and promoted by Basarab Nicolescu (a Romanian quantum physicist based in Paris), which we have coined *Nicolescuian transdisciplinarity*.<sup>3</sup> We also describe another new idea, the *transversity*, a concept we have developed to contribute to the vision of a university for the future (McGregor & Volckmann, 2011).

## Part I: Overview of Nicolescuian Transdisciplinarity

As noted, *trans* means to zig-zag back and forth, to cross over, to go beyond, and to transcend borders and boundaries. In contrast, *mono* means one, *multi* means more than one, and *inter* means between. These three approaches are all anchored in a specific discipline, alone or in interactions with other disciplines, within disciplinary boundaries, sometimes facilitated with bridges to ensure collaboration. Furthermore, unlike transdisciplinarity, none strive to interact with the rest of the world; rather, their activities are confined within the walls of higher education. As explained by McGregor (In Press ), "multidisciplinary learning is the least sophisticated form of cross-disciplinary work in which *members of a team*, representing different disciplines, work in a self-contained manner, isolated from the team while working on a problem of common interest. Interdisciplinary learning expands the multidisciplinary process by (a) increasing the level, and coordination of, collaboration and communication amongst team members and (b) by integrating the team’s findings. (There is no intent to remove

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<sup>3</sup> As a caveat, we acknowledge, but do not include, another prevailing approach to transdisciplinarity stemming from the 2000 Zurich International Transdisciplinary Conference (see ‘Zurich Manifesto’, 2000). Those in attendance agreed that a new methodology for creating knowledge was not needed to address the complex problems facing the world. Instead, they felt the world requires joint problem-solving of problems pertaining to the science-technology-society triad (Nicolescu, 2010b). Proponents of this approach to transdisciplinarity include Helga Nowotny (2003) and Michael Gibbons and colleagues who refer to it as the ‘Zurich Manifesto’ (see Gibbons et al., 1994; Klein et al., 2001).

boundaries between the separate disciplines.) The work of the team engaged in transdisciplinary learning, the most evolved, is highly integrated and organized, informed by comprehensive constructs and methods that transcend (go beyond) disciplinary structures and conventions. Through increased levels of trust, blurring of disciplinary boundaries and escalating valuing of each other's knowledge and perspectives, transdisciplinary learners become a *community of learners working for a common cause* rather than just a collection (as per multi- and interdisciplinarity)."

Nicolescu took issue with the myopic approach of solving the problems of the world using *just* mono, multi and/or interdisciplinarity. He argued that these three approaches tend to favour the empirical methodology (quantitative, positivistic, scientific, normal science) (Nicolescu, 2012), with some disciplines also embracing interpretive and critical methodologies (more along the lines of qualitative, post-positivistic, post normal) (see McGregor & Murnane, 2010). Nicolescu (1985, 2002) advocated for an entirely new methodology for generating knowledge, one he called transdisciplinarity. We agree; confining knowledge creation within the walls of the university, and restricting research to just the empirical methodology, ignores the rich contributions that can emerge from iterative interactions with those outside the academy, living the problems being addressed. Cross-sectoral interactions and resultant knowledge creation are the crux of the transdisciplinary approach.

After publishing a book on his approach in 1985, Nicolescu's notion of transdisciplinarity was again articulated at the first world congress on transdisciplinarity held in Portugal, 1994. Those in attendance signed a *Transdisciplinary Manifesto* (see the Interdisciplinary Encyclopedia of Religion and Science, 2003-2013). Nicolescu (2002) followed this up with a book titled *Manifesto of Transdisciplinarity*. A plethora of writings has emerged since 2002, leading to richer and more nuanced explanations of his approach to transdisciplinarity. Many of these intellectual treatises will be cited in this chapter, in addition to his earlier works (e.g., Nicolescu, 1985, 1997, 1999, 2000a, 2002, 2004, 2006, 2007, 2008, 2010a,b, 2011a,b, 2012).

Succinctly, Nicolescu's approach to transdisciplinarity involves three axioms or pillars (see Figure 4). Knowledge is understood to be emergent and complex (epistemology). There are multiple Levels of Reality, mediated by the Hidden Third (ontology). Creating new TD knowledge involves the use of the Logic of the Included Middle. While Nicolescu eschewed the addition of a fourth axiom dealing with values (axiology) (e.g., Nicolescu, 2011, p. 37), Cicovacki (2009) and McGregor (2011c) have developed arguments for its inclusion in the TD methodology.

This chapter will focus on Nicolescu's three axioms. As does Nicolescu (2010b), we start with reality (ontology) because if people know the nature of existence, then they can determine when something is true, false, unknown or unknowable (epistemology), using appropriate logic, which in turn helps them determine the nature of fundamental values and of moral choices (axiology) (Engle, 2008)

#### Three Pillars (Axioms) of Nicolescuian Transdisciplinary Methodology

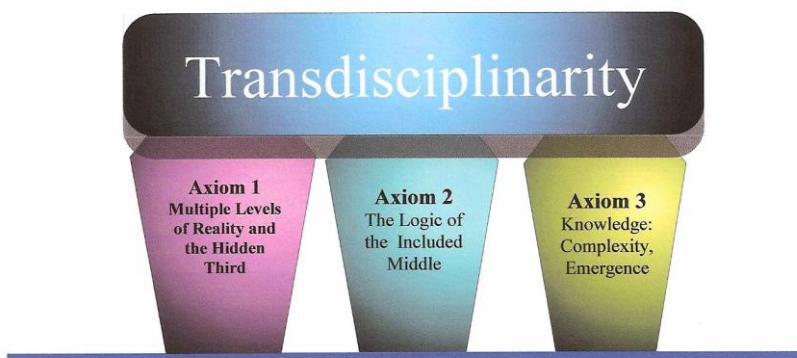


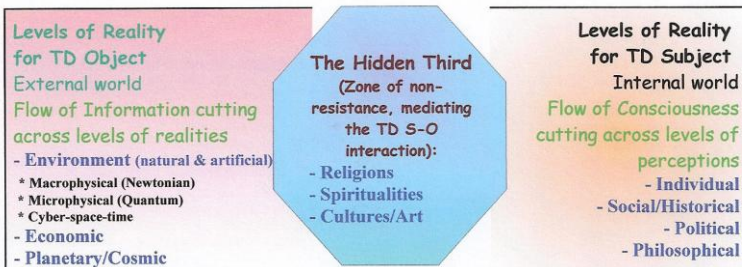
Figure 4: *Three pillars (axioms) of Nicolescuian transdisciplinary methodology.*

#### Reality (Ontology)

As early as the mid-seventies, Nicolescu “worked out” that transdisciplinary ontology comprises multiple Levels of Reality mediated by the Hidden Third (he uses uppercase) (Nicolescu, 2011, p. 32). While multi- and interdisciplinarity stem from classical physics and modern sciences (Newtonian), transdisciplinarity stems from quantum physics and quantum cosmology as well as chaos theory, living systems theory, consciousness sciences and other human sciences (Nicolescu, 2010a, 2011b). “[T]he methodology of modern science...is not valid in the field of the transdisciplinarity” (2012, p. 2). Hence, a new notion of what counts as reality is needed, one that is not determined by classical, modern science (Nicolescu, 2011a, 2012). The latter holds that there is only one Level of

Reality, the physical reality. Rejecting this premise, Nicolescu worked out that there are multiple Levels of Reality that are accessible to humans, due to the existence of multiple levels of human perception (first published in 1985, see also McGregor, 2011a).

In more detail, Nicolescu (2006) believed it is essential to seek multiple perspectives on any human problem because the intent is to integrate many levels of truth while generating new TD knowledge. To that end, his approach to transdisciplinarity embraces at least ten different realities organized along three Levels of Reality (see Figure 5): (a) the internal world of humans, where consciousness flows – the TD-Subject (comprising political, social, historical, and individual realities); (b) the external world of humans where information flows – the TD-Object (comprising environmental, economic, and cosmic/planetary realities); and (c) the Hidden Third. Peoples’ experiences, intuitions, interpretations, descriptions, representations, images, and formulas meet on this third level. Three realities exist in this intuitive zone of non-resistance, this mediated interface: culture and art, religions, and spiritualities (Nicolescu, 1985, 2002).



Levels of TD Transreality for TD Subject and TD Object, with Hidden, Mediating Zone

Figure 5: *Levels of TD transreality.*

Nicolescu needed a concept to accommodate people resisting other people’s world views, and a way to allow for the integration of these world views. He used the notion of the Hidden Third. ‘The third’ typically refers to someone playing a mediating role between two entities. *Hidden* obviously means it is invisible. Succinctly, Nicolescu (2011a) suggested that the “zone

of non-resistance plays the [mediating] role of a third between the Subject [information] and the Object [consciousness and perceptions],... act[ing] like a secretly included middle that allows for unification” (p. 31). “The loops of information [object] and consciousness [subject] have to meet in a least one point *X*” and they are able to meet because of the actions of the mediating Hidden Third: “Subject, Object, Interaction” (Nicolescu, 2005, p. 9).

In more detail, Nicolescu (1985, 2011a) drew on the quantum notions of the vacuum, resistance and discontinuity to work out his idea of the Hidden Third. These concepts allowed him to posit that the space between things is not empty; rather, it is full of potential and ripe for chances to move around and connect with other realities if people can move past their urge to hold onto their own point of view. For him, the Hidden Third is a quantum way to represent people coping with their resistance to shifting perspectives and world views. If people can overcome their resistance to differences or contradictions, it frees them to cross into the zone of non-resistance, the vacuum, to other points of view. The Hidden Third is a way to conceive of people moving to a place where they become open to others’ perspectives, ideologies, value premises and belief systems, inherently letting go of aspects of how they currently *know* the world (see Cole, 2006; McGregor, 2011a; Brenner, 2005; 2011).

As well, each of the 10 realities along the three levels (see Figure 5) is characterized by its incompleteness; however, in unity, these realities generate new, infinite transdisciplinary knowledge (Nicolescu, 2006). Indeed, transdisciplinarity assumes that Reality is always in flux. It is plastic (Cillier & Nicolescu, 2012; Nicolescu, 2011b), meaning it is malleable and pliable. Reality changes due to people’s thoughts, feelings, and actions (Cillier & Nicolescu, 2012). Transdisciplinarity is deeply concerned with the dynamics that are created by the simultaneous action of several Levels of Reality – the movement of Reality, facilitated by the lubricating role of the Hidden Third (Nicolescu, 1999). The result of this movement is the emergence of new TD knowledge because people’s eyes and minds have been opened to other points of view, which can be integrated into new knowledge, using the Logic of the Included Middle.

## Logic

Transdisciplinarity asserts that each Level of Reality is governed by a different kind of logic (Nicolescu, 2008). Logic is concerned with the habits of the mind that are acceptable for inference and reasoning when arguing

one's position on an issue. Philosophy holds there are three major logics: logos (reasoning), pathos (emotions) and ethos (character). As with ontology, because multi- and interdisciplinarity stem from classical physics and the modern sciences, Nicolescu posited that we need to have a different kind of logic when creating new TD knowledge. Instead of the Logic of Exclusion (logos) used by modern science, he proposed the Logic of Inclusion – the *Logic of the Included Middle*. He clarified that “the logic of the included middle does not abolish the logic of the excluded middle: it only constrains its sphere of validity” (Nicolescu, 2000a, p.6).

The modern science logic of exclusion assumes that the space between objects or people is empty, flat, static and void of life (much like the space between the balls on a billiard table). In academic life, this logic manifests as separate departments, journals, library holdings, conferences and professional associations. It is also evident in the familiar intellectual actions of: deduction (cause and effect), linear thinking, reductionism (breaking things down into parts to understand the whole from which they come), and either/or approaches (dualism) with no room for contradictions (see McGregor, 2007, 2011d).

In stark contrast, the Logic of the Included Middle draws on inclusive logic, which enables people to imagine that the space between things is alive, dynamic, in flux, moving and perpetually changing. It is in this *fertile middle space* that transdisciplinary manifests itself. Transdisciplinarity has people stepping through the zones of non-resistance (away from one worldview or one notion of reality toward others) onto a fertile, moving floor of the *included middle*, where, together, they generate new TD intelligence and knowledge. When people from different disciplines and sectors come in contact with each other and are motivated, an energizing force is generated – a synergy is created. This synergy leads to the generation of *embodied knowledge* created from the energy emanating from *intellectual fusion* (McGregor, 2004). McGregor (2009) employed a lava lamp metaphor to explain this idea.

As well, a sense of community and belonging is nurtured in the included middle – a sense that individuals are part of something bigger than each of them. At the same time, there is a realization that everyone is a new and different person in each relationship(s) formed in the fertile middle. The strength and potentialities that emerge from these intellectual encounters are life-giving and transformative. The logic of the included middle requires scholars to create a space for dialogue and knowledge generation. In this space, attempts would be made to reconcile different logics for the sake of solving complex problems facing humanity. Using the logic of the included



middle to move through the ten different types of reality (by making space for contradictions and discontinuities in realities), creates a permanent possibility for the evolution of complex new TD knowledge (see McGregor, 2011b).

## Knowledge (Epistemology)

Horlick-Jones and Sime (2004) coined the phrase *border-work* to refer to the intellectual work that occurs when people living on the borders of the academy (university disciplines) and civil society engage in knowledge generation to address complex problem solving. Nicolescu (2002, 2008) posited that such TD knowledge is based on cross-fertilization, and is characterized by embodiment, complexity and emergence (see McGregor, 2011b). This approach is in sharp contrast to the modern science assumption that knowledge is static. Transdisciplinarity assumes that knowledge is open and alive because the problems the knowledge addresses are alive, emerging from the life world (Max-Neef, 2005; McGregor, 2009; Nicolescu, 2005).

Nicolescu described TD epistemology as complex and emergent. In some documents, he actually referred to the *epistemology axiom* (e.g., 2000a, 2010a), but usually he called it the *Complexity Axiom: The Universal Interdependence* (see Nicolescu, 2011a, p. 36). He believed that complexity is a modern form of the ancient principle of universal interdependence, in that “everything is dependent on everything else, everything is connected, nothing is separate” (Nicolescu, 2004, p. 48). Referencing this principle, Nicolescu referred to “the simplicity of the interaction of all levels of reality” (2011a, p. 37), intimating the deep complexity of reality.

He described TD knowledge as simultaneously exterior and interior. Exterior refers to the study of the universe and interior refers to the study of the human being; knowledge of each sustains the other because they are interconnected (Nicolescu, 2005). Nicolescu (2000a,b) argued that the transdisciplinary methodology must embrace complexity because TD knowledge transgresses duality, and is able to do so because of TD’s open unity, which encompasses both the universe and the human being. Transdisciplinary “knowledge is forever *open*” (Nicolescu, 2005, p. 7), emergent, in progress and in-formation, meaning it cannot help but be complex.

Regarding the Complexity Axiom (knowledge), Nicolescu (2011, p. 36) clarified that the existing theories of complexity to not include Levels

of Reality or zones of non-resistance; hence, they are inadequate for transdisciplinary. Despite this lacuna, we cannot find any specific treatment of epistemology as complexity in any of Nicolescu's work (a view also held by Poli, 2009), although an earlier document is entitled *Transdisciplinarity and Complexity* (Nicolescu, 2000b). In 2010, Nicolescu recognized the need for a "future detailed study of *transcomplexity*" to accommodate the "complexity of the Trans-Reality" (2010, p. 8). Shortly after, he began to explore the potential of bringing contemporary theories of complexity to bear on transdisciplinarity (Cillier & Nicolescu, 2012). In this paper, they declared that "studying complex phenomena however, requires a [complex] systems approach that departs from the traditional, analytical method of science as proposed by Newton" (p. 714).

In the meantime, recognizing there are many definitions of complexity, Nicolescu (2010a, 2011a, 2012) concluded there is currently only one approach that is sympathetic with non-Newtonian transdisciplinarity, that offered by Edgar Morin. We now draw on Morin's (1999, 2005) work to tease out the axiom of TD knowledge as complex and emergent (see also McGregor, 2004, 2009, 2010, 2011b, 2012, 2013). We also draw on the musings of Max-Neef (2005), who also references Edgar Morin's notion of complexity as do Ciller and Nicolescu (2012).

Transdisciplinarity draws its notion of complexity and emergence from the new sciences of chaos theory, quantum physics, living systems theory and complexity theory. Transdisciplinarity holds that the process of emergence comes into being as people pass through the zone of non-resistance (accepting there are many realities) and enter the fertile middle ground to problem solve using the logic of inclusion. Emergence refers to novel qualities, properties, patterns and structures that appear from relatively simple interactions among people, qualities that did not exist when presented in isolation. These new qualities are layered in arrangements of increased complexity (Morin, 2005; Nicolescu, 2008).

Emergence means problem solvers would assume that the problem(s) they are addressing *continually change* as people try to jointly solve them. Each problem (e.g., poverty) is a rich weave of societal structures and functions. The weave of poverty (and people's understandings of it) keeps changing because new and coherent structures, patterns and properties *emerge* as a result of iterative interactions amongst people trying to address poverty while engaged in intellectual border work within the web of changing relationships (on the included middle ground, mediated by the Hidden Third). Original perceptions of the problem are left behind, transformed, even transcended, as new understandings of the

problem take shape and as synergistic energy is generated during the intellectual border-work, via intellectual fusion (McGregor, 2004, 2009).

TD knowledge is created in the fertile middle ground, emerging from gradual cross-fertilization. The latter results from the iterative convergence of different actors and their fuzzy-edged balls of knowing, shaped by their respective disciplinary or sectoral expertise. Also, TD knowledge emerges through the process of integration, understood to mean opening things up to all disciplines and to civil society-knowing so that something new can be created via synthesis and the harmonization of ideas and perspectives (Nicolescu, 1997).

Finally, the TD methodology assumes that everything is *complexus* – woven into a web, where the focus is on the relationships (links) among things (the Universal Interdependence principle at work). When people accept the world and everything in it as dynamic, evolving and always *in-formation*, their knowledge, explanations and definitions gain nonpermanent status. TD knowledge is always *in-formation* (emergent), open, vibrant and alive (McGregor, 2004; Nicolescu, 2005). TD knowledge is embodied, a part of everyone who co-creates it by using the logic of the included middle as they move through the zone of non-resistance to share consciousness and information (multiple Levels of Reality mediated by the Hidden Third) at the borders between higher education and the rest of the world. We refer again to the lava-lamp metaphor used by McGregor (2009) to explain this process, and to a conversational video she prepared on transdisciplinarity (Mount Saint Vincent University, 2008).

## Part II: The Transversity - The University for the Future

We were inspired by Nicolescuian transdisciplinarity, so much so that we coined a new term, the *transversity*, to refer to the university of the future (McGregor & Volckmann, 2011). Currently, institutions of higher education are called universities. *Uni* is Latin for one. *Versity* stems from Latin *veritas*, meaning truth. So, in effect, university literally means one-truth, and this notion of truth aligns with the current convention of teaching students disciplinary truths (rather than *transtruths*). Disciplinary truths severely limit people's insights into the complex problems facing humanity.

On the other hand, *trans* is Latin (*trare*) for to cross, over, beyond, through and zig-zag (lateral movement). *Transverse* means lying across something, moving from side-to-side (Hoad, 1996), akin to iterative border crossing during intellectual border-work. The word *transversity* could mean seeking the truth by moving back and forth between disciplines and

between the academy and civil society (McGregor & Volckmann, 2011). This moniker respects that the new TD university would succeed through a combination of: (a) disciplinary work (mono), (b) scholarship *between* and among disciplines (multi and inter), and (c) knowledge generation *beyond* academic disciplines and the academy and *across* sectors external to the university – the essence of transdisciplinarity (Nicolescu, 1985).

## The Essence of a Transversity

Drawing on our book on transversity (McGregor & Volckmann, 2011), we now tender a discussion of the essence of a transversity. A transdisciplinary university would have a new purpose (Jantsch, 1972), that of seeking *wisdom* in addition to knowledge (Weislogel, 2007). It would restore the idea of *synthesis and integral thinking* to complement (but not replace) fragmentation and analysis. It would strive to create unity or a ‘*symphony of knowledge*’, strive for wholeness and integration of many ways of knowing (Weislogel, 2007).

A transversity would appreciate that solutions to humanity’s problems cannot be found solely in the ivory towers of disciplinary learning without involving the critical mass of the society (‘Zurich Manifesto’, 2000). The “new ‘universitas’ would be humanity-oriented” (Jantsch, 1972, p. 34). It would become one of several basic units in a decentralized, pluralistic process of shaping a global future, a common policy for society. It will be a “‘*strategic antenna*’ oriented toward society’s values as well as toward the future” (Jantsch, 1972, p. 34).

A transversity would have a deep respect for the integration of multiple perspectives. “Reality is complex and convoluted and the truths about it will be revealed by a multiplicity of perspectives... woven into a coherent whole whereby the differences in approaches are complementary rather than contradictory” (Albrecht, Freeman & Higginbotham, 1998, p. 57). As people from the many interacting sectors walk (weave) back and forth across their respective boundaries, as they engage in intellectual border-work, the division lines become smudged and blurred and, eventually, all boundaries become less pronounced, especially those around disciplines (McGregor, 2009).

Jantsch (1972) envisioned that a transdisciplinary university would design itself so it integrates each of: know-how (knowledge per se), know-what (deeper meanings), know-where-to-go, and know-why. All the while, it would position itself as an institution actively engaged *in* society, *with* society. It would lose its fear of sharing disciplinary-bound knowledge and

become open to active involvement in mutually-generated and *negotiated knowledge* along multiple levels of reality and perceptions, as posited in the 1997 *Locarno Declaration*. Those in attendance at this international congress on “Which university for tomorrow?” signed a declaration concerned with the transdisciplinary evolution of the university (Camus & Nicolescu, 1997). They concurred that TD education can open the way toward integral education but only if the architects of higher education “enable the infusion of complex and transdisciplinary thought in the structures and programs of the University of tomorrow” (Camus & Nicolescu, p.1).

In an interesting twist, Torkar and McGregor (2012) proposed that from all of this *trans-activity* within a transversity, a new entity would emerge, a *stakesharer* (instead of stakeholder or shareholder). Most everyone is familiar with the term stakeholder, referring to someone who can affect, or can be affected, by others’ decisions. To have a stake in something means people share or have an involvement in it because everyone has a stake in the outcome – everyone’s interests are affected. Torkar and McGregor coined the term *stakesharer* to reflect the idea that, within transdisciplinary work, people share ideas, solutions, threats and opportunities as they try to articulate their collective response to nature-human interface problems. All the while, they are balancing different logics, values, ways of knowing, and are functioning on many different levels of reality as they try to weave together their differences to generate new TD knowledge and solutions to problems; hence, the need for a new concept to accommodate this process, the *trans-stakesharer*.

## Nature of the Shift Involved when Moving Toward a Transversity

Huge epistemological, ontological, logical and axiological issues will emerge in a transversity. Respectively, these include What counts as knowledge and legitimate modes of knowledge creation? What counts as reality? What counts as acceptable reasoning to make an argument? and What are the roles of values and of the researcher(s) in the knowledge creation process? These bastions of the academy are all challenged when people engage in TD scholarship (McGregor, 2007).

Not surprisingly, the TD approach to understanding scholarship within the academy comes with many challenges and opportunities, all requiring soul searching and reframing of oneself as a university-based scholar. The appendix profiles the profound shift academics face when moving toward transdisciplinary methodology (drawn from McGregor,

2004, 2007, 2009, 2013, In Press). To aid in helping readers find their familiar disciplinary (one truth) role, and to give them a sense of how their thinking would transform in a transversity (transtruths), the transdisciplinary concepts in the appendix are highlighted, juxtaposed against those of conventional, disciplinary thinking. Remember both are needed; they complement each other.

Even more revealing, McGregor (2007) scanned the literature and culled the following compelling insights into what TD scholarship might look like in a transversity. The connections to the three pillars of Nicolescuian transdisciplinarity are readily evident:

- academics have to be open to *de-differentiation* (rather than relying on the integrity of disciplinary differences);
- scholars have to assume that the *fertile space* between disciplines and between the academy and society *is* where new ideas take root and grow, rather than assuming new ideas outside disciplinary purview should fall between the cracks of disciplinary floors, landing in an empty abyss;
- academics have to rely on both the *safety of the evolving collective* of actors and the potential and hidden *possibilities* rather than rely on the certainty of relatively risk-free, disciplinary expertise;
- academics have to gain a new appreciation for *intellectual fusion* (i.e., when separate ideas and people come together, they move faster when exposed to each other than when alone – they fuse together into a new, synergistic whole);
- within this evolving collective, academics have to accept that they are *transient*, that they have a foot in their academic home while roaming the connections available in the network of relationships required to generate TD knowledge;
- the ‘disciplinary, academe imperative’ has to be set aside to create a voice for those working in other types of organizational homes, in other contexts; that is, the *humanity imperative*;
- a new trait, *institutional diversity*, has to be respected. It refers to when research and scholarship take place way beyond the hallowed halls of the ivory tower;
- people have to move from creating knowledge from a position of disinterested, disciplinary detachment to *negotiated knowledge* with those holding different interests but common concerns for human problems (*stakeholders*);

- when creating TD knowledge, people have to learn to look together for *patterns to use as templates* for finding similarities between seemingly dissimilar actors rather than falling back on familiar, intradisciplinary jargon and semantics;
- scholars can no longer wear the mantle of ‘founding father’ of knowledge or an idea because the TD knowledge that is created is a collective initiative – *an embodied knowledge*;
- while creating embodied TD knowledge, academics have to embrace other notions of *robustness of information* (aside from reliability and validity for empirical work); they have to ensure they do not use un-robust information to solve deep, human problems;
- to that end, scholars also have to strive for *socially robust knowledge* and *socially approved knowledge* (robust criteria might include justice, effectiveness, efficacy, autonomy);
- scholars have to accept that social concerns can no longer be held at arm’s length; rather, *social concerns are the arms that shape* TD scholarship;
- it is the *context* of where the new knowledge will be applied that matters, not the agenda of the disciplinary home of the scholars;
- the embodied knowledge *created in context* belongs to everyone rather than being confined to (trapped within) a disciplinary map; and,
- academicians have to accept that nothing is sacred anymore as scholars and other actors search together for connections; they have to *take quantum leaps* into the realm of transdisciplinarity where the academy meets society for the betterment of humanity.

## Learning from Transversity Experiences

The previous section shared our preliminary thoughts on the nature of the methodological shift involved when moving toward a transversity shaped by Nicolescuian transdisciplinarity. We remained intrigued with what might be involved in actually creating a transversity. To begin to answer this question, we conducted a study of transdisciplinary initiatives in six universities and one research council in United States, Europe (Germany,

Austria, Romania), Mexico and Brazil, and Australia (McGregor & Volckmann, 2011).<sup>4</sup>

We discovered there is “no one way” to go about bringing transdisciplinarity to higher education because it depends very much on the context, the leadership and the politics. However, those we interviewed agreed that transdisciplinarity *does* make a difference. It bridges the gap between sophisticated institutions (including colleges and universities), communities (society) and the private sector. A transdisciplinary approach joins individuals from many academic disciplines with members of society (civic and corporate) to address challenges that transcend anyone discipline within the academy. Through this process, the university can play an *integrator role* to (re)establish an active dialogue with other forms of knowledge. Through dialogue, transversities bring together community and corporate perspectives with different, merged, disciplinary perspectives to solve the myriad of complex problems facing humanity (McGregor & Volckmann, 2011). We learned several valuable lessons from these initiatives, which we will now share (see the book for more details).

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<sup>4</sup> As a preamble for our book *Transversity*, we published a series of seven articles in the *Integral Leadership Review* journal about the idea of a transversity (2010-2011). They are available at:

#### 2010

- Making the transdisciplinary university a reality. *Integral Leadership Review*, 10 (2), <http://www.archive-ilr.com/archives-2010/2010-03/2010-03-article-mcgregor-volckmann.php>
- Transdisciplinarity in higher education: The path of Arizona State University. *Integral Leadership Review*, 10(3), <http://www.archive-ilr.com/archives-2010/2010-06/2010-06-article-mcgregor-volckmann.php>
- Transdisciplinarity in higher education, Part 3: BOKU and the European Union. *Integral Leadership Review*, 10(4), <http://www.archive-ilr.com/archives-2010/2010-08/td810.pdf>
- Transdisciplinary learning in graduate programs in Mexico and Brazil. *Integral Leadership Review*, 10(5), <http://www.archive-ilr.com/archives-2010/2010-10/1010td.pdf>

#### 2011

- Transdisciplinarity in higher education (Australia), Part 5. *Integral Leadership Review*, 11(2), <http://integralleadershipreview.com/2011/03/transdisciplinarity-in-higher-education-part-5/>
- Nicolescu in Romania [Part 6]. *Integral Leadership Review*, 11(3) <http://integralleadershipreview.com/2011/06/transdisciplinarity-in-higher-education-nicolescu-in-romania/>
- Synopsis of *Integral Leadership Review*'s series on transdisciplinarity in higher education. *Integral Leadership Review*, 11(3) <http://integralleadershipreview.com/2011/06/transdisciplinarity-in-higher-education-part-7/>



## Disciplinary

Transitioning to a transdisciplinary approach, or convincing people of its merit, requires constant messaging and innovative strategies over a span of time. Especially, universities striving for some degree of transdisciplinarity have to constantly message that disciplines should not be abolished; rather, their varying perspectives are needed to solve complex problems. However, disciplines need to be taught and research conducted in the *context of their dynamic relationships with each other* and with societal problems. They cannot be perceived as protected silos of specialized knowledge anymore, if the university wants to move toward transdisciplinarity. Only fluency across disciplinary boundaries will provide clear views of the world and what needs to be done to ameliorate humanity's pressing problems. This fluency emerges through well-thought out opportunities for cross-collaborative work. Advocates for transdisciplinarity (coming from many disciplines) need to be able to talk to each other if the boundaries between the disciplines, especially between the sciences and humanities, are to come down or become more permeable. Without this communication, higher education will continue to perpetuate factories of specialized knowledge, an approach not conducive to solving the wicked, complex problems facing humanity (Camus & Nicolescu, 1997; McGregor & Volckmann, 2011).

## Faculty

Faculty who are hired to do transdisciplinary work will need to be *interdependent-minded*, valuing the connections among and beyond the academy needed to solve society's problems. They will know how to *conceptually* work across disciplines (not just bring disciplinary-specific information to the table). They will strive to *fuse perspectives* to generate new knowledge. This mind set is a far cry from hiring disciplinary specialists who will work within one department, alone or with fellow disciplinarians. Interdependent-minded faculty members would hold cross-department, split appointments as well as concurrent appointments in any onsite and off site research centers, think tanks or institutes (McGregor & Volckmann, 2011).

Several people interviewed spoke directly to the issue of finding a common language so people can talk with each other. This process entails more than just finding the right words. It requires empathy, the ability to see the world through the lens of others and then to act from those insights.

Transdisciplinary projects must provide space within which to ‘grow people’s capacity’ to communicate across boundaries (disciplinary and sectoral). On a pragmatic note, it will be necessary to help people rethink the university’s traditional arms-length relationship with industry and the private sector for funding. Joining with industry to solve a complex, wicked problem is not the same thing as receiving monies from industry for product research and development (R&D) (McGregor & Volckmann, 2011).

## Students

From a transdisciplinary stance, universities would focus on what kind of student it *wants to graduate* rather than what kind of student it wants to take in (e.g., grade point average or socioeconomic group). When recruiting students, the university would assume that people have an *innate* intellectual potential to engage in transdisciplinary work. Assuming that students come to the university *with a built-in predisposition* for something, instead of assuming they arrive with missing skill sets, is a huge paradigm shift. Innate means someone is born into something. Assuming that each applicant is born with the ability to take up transdisciplinary scholarship is a powerful and meaningful stance for a university to take, and challenges the norm (McGregor & Volckmann, 2011).

It is a given that the university has to scaffold students’ learning experiences by providing opportunities to work across disciplines (including learning from faculty housed in a collection of separate departments and working with fellow students from other departments/disciplines on joint projects). Higher education must make concerted efforts to facilitate students’ perspective shifts, their capacity for innovation and their ability to unify knowledge from many disciplines and sectors, scaffolded with the transdisciplinary perspective. Students who participate in these programs must have the opportunity to *work in transdisciplinarity*, to steep in it for an extended period of time with fellow students from many disciplines, in many different settings and sectoral contexts (McGregor & Volckmann, 2011).

## Leaders

Everyone interviewed for our study agreed that leadership is a necessary condition for the transformation of the higher education system toward transdisciplinarity. We now share some highlights from those who strived to bring transdisciplinary to higher education (see McGregor and Volckmann

(2011) for more insights, at pp.129-131). Those in leadership positions must be *open to new paradigms*. They must be open to *transcending all sorts of borders* and to being able to *work on the frontier* of knowledge, at the borders. They must actively strive to *integrate non-academic actors* into the university system and vice versa, again working at the borders. They must appreciate they no longer need to protect the disciplinary core; rather, they must be instrumental in *integrating disciplines, research paradigms and personalities*. This integration entails employing *finesse while creating a culture* where everyone feels valued, listened to and respected. Leaders must encourage people to *think in an agile manner* (quick witted, nimbly and shrewdly) so new programs can be created for the university rather than new programs that belong to one department or unit. And, they must *allow leaders to emerge* in many parts of the system, people who have the wherewithal and knowledge to *leverage small parts* of the system to effect far-reaching, systemic change within the university's systems and processes (much like Senge's (2006) learning organization).

## Politics

Basarab Nicolescu (see McGregor & Volckmann, 2011, Chapter 6) explicitly referenced politics in relation to the TD process within higher education. He used the term *mentalities* to refer to politics and asserted that in many institutions of higher education, mentalities are the problem when it comes to instigating TD initiatives. Leaders need to be convinced that their current approaches to higher education are inefficient and not conducive to a healthy society or world. The aim of higher education should be social transformation and the aim of any TD program should be to 'open the university to society'. The attendant politics are complicated and complex because transdisciplinarity is a huge change from the conventional way of 'doing things' in higher education. Architects of transdisciplinary programs and degrees must remain aware of the mentalities of the leaders, and help them 'connect with the idea of transdisciplinarity' (appreciating their natural resistance to change) so they can become aware of the potentialities of transdisciplinarity in higher education.

## Conclusion

In this chapter, inspired by Palacky University's vision of a university for the future, we shared an overview of Nicolescuian transdisciplinarity and introduced the idea of a transversity. We discussed the essence of a

transversity, the nature of the shift involved when moving toward a transversity, and shared some lessons learned from seven global initiatives striving to bring transdisciplinarity to higher education. Transdisciplinary work happens in the interface between higher education and rest of the world, at the borders. We believe the transversity (shaped by Nicolescuian transdisciplinarity) is a possible model for the university for the future. It is a powerful approach from which the architects of higher education can indeed interpret *higher* in its fullest sense (Hampson, Current Volume).

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## Appendix to Chapter 5

Transitioning to a Transversity: Transdisciplinary and Disciplinary Concepts (culled from McGregor 2004, 2007, 2009, in press, a, b)

### *Logic*

- use quantum inclusive logic (the Logic of the Included Middle) rather than Hegelian exclusive logic; inclusive logic refers to the point of extreme contradictions or antagonism, when something happens (an 'inclusive' temporary T-state) that resolves the contradiction while neither contradictory element disappears completely
- work in full, fertile middle space between disciplines and civil society actors (rather than build bridges over dead, stagnant or empty space or take separate roads)
- things are in constant flux, formation and movement (flow and fluidity) (rather than static, stalled or at rest)
- iterative crisscrossing, zig-zagging and moving laterally (rather than in straight lines or in circles)
- moving way beyond boundaries (rather than staying within boundaries or blurring boundaries)
- intellectual outer space, a creative commons, where integration happens (rather than private, inner space)
- create dynamic space for dialogue where new ideas can crisscross and merge (rather than sharing different analyses or creating new applications)
- web of dynamic, ever-changing relationships (rather than disconnected individualism)
- waves and particles, ebbs and flows (rather than either/or dualism)
- dance metaphor (rather than billiard balls or networks)

### *Reality (ontology)*

- Levels of Reality - multiple realities- governed by different kinds of logic (ethos, pathos and logos) (rather than one reality and only governed by logos)
- Reality is a multi-layered, coherent whole (rather than a single dimensional part)
- convergence (versus parallel)
- the zone of acceptance (non-resistance), stepping out of safety zone through veil of resistance into the fertile space (rather than adhering to one world view and perspective)
- shared truth emerges from the work in the fertile space (rather than one truth held onto in the dead space)

### *Knowledge (epistemology)*

- emergence (rather than static or standing still)
- complexity (versus complicated)

- integral, concerned with respect for healthy tension holding things together as they evolve (versus integrated, balanced and in harmony)
- chaos as unpredictable order emerging (rather than lack of predictable order)
- integration and holistic (versus siloed, fragmented and disconnected)
- copyleft (expect information to change) (rather than copyright)
- open unity, pluralism and complexity (rather than dualities)
- co-create and use new, enduring ‘transdisciplinary concepts’ as building blocks and bridges to joint problem solve (rather than working in temporary interdisciplinary teams using respective disciplinary ideas)
- in-formation (rather than fixed and proprietary information)
- jointly discern and employ isomorphies, common, predictable *patterns* (rather than separate *ideas*)
- co-create a uniting knowledge via cross-fertilization (rather than protecting disparate, siloed knowledge)
- new ‘patterns of integrated (interwoven) knowledge’ emerge (rather than separate and parallel *streams* of disciplinary information)

## *QUESTIONS AND REFLECTIONS*

1. Explain the ontology of transdisciplinarity according to Nicolescu.
2. Explain the epistemology of transdisciplinarity according to Nicolescu.
3. Explain the logic of transdisciplinarity according to Nicolescu.
4. What is your opinion of transdisciplinarity as described in this article? What steps could you take to make your work more transdisciplinary in character?
5. Think of an institution of higher learning that you feel some sense of affinity with. Try to imagine what steps would be necessary in order to transform this institution into a transversity.
6. Envision *your* idea of a transversity. What would it be like?