Transforming wildlife health professionals into effective participants in socio-ecological problem solving

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Essay for a dialogue on "Animal Health Education in a Changing World" by the McEachran Institute

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"*Alles ist Wechselwirkung.*" Everything is interaction and interdependency. More than two hundred years after Alexander von Humboldt jotted this sentence in his diary, as part of a *tour de force* introduction of the concept of total socio-ecological connectivity to Western science, Western scientific institutions and thinking remain yoked with disciplinary silos and a reductionist paradigm. Concepts like the "social determinants of health" and "One Health" have been created in an attempt to drive systemic change that embraces these interdependencies. Systems approaches and fields of research practice have emerged and converged on a fundamental truth: nothing exists in isolation, everything is interconnected and interdependent, everything is part of a socio-ecological whole.

My shelves are laden with Australian natural history texts and, like many of my colleagues, I have spent my life studying aspects of Australia's environment. When I step out onto Country, here where I live in Australia, I understand that I would struggle to survive despite any scientific environmental knowledge that I hold. Yet, for tens of thousands of years the Wiradjuri people, to whom this Country belongs, have used very different systems of knowledge to thrive, sustaining a people and culture across time inconceivable. I may find Australia beautiful, but I also have grown up with and inherited the colonial myth of society's struggle to survive *on* this Country, rather than an understanding of society as part *of* this Country. Each of us has a limited understanding of the world shaped by our experience and reflection, and that defines the knowledge opportunity available to us as individuals.

Within this limited sphere of understanding, we ask ourselves: how should we think about wildlife health and our associated responsibilities, and recognising the interdependence of wildlife, human, ecosystem and planetary health?

Early scientific understanding was that wildlife disease was a local phenomenon for which, if relevant to people at all, a local, biology-informed approach to management sufficed. That was before the profound impacts of chytridiomycosis on amphibian diversity, of white nose syndrome on bats, of the COVID-19 pandemic, of bushfires of unprecedented magnitude. Wildlife health is now understood to be both local and global, to have sustained impacts on biodiversity, ecosystems and society, and to be interdependent with complex, interacting social and ecological factors and effects. Wildlife health is a socio-ecological systems phenomenon,

and wildlife health challenges are rapidly accelerating and expanding in effect and complexity as we move deeper into the Anthropocene.

I had an epiphany this year, upon realising that Wiradjuri has no language to describe 'nature' or the 'environment'. There is only Country, the whole, of which society and culture, animals and plants, land, water and sky are part. First Nations are the original systems thinkers.

Socio-ecological systems are impossibly complex and multifactorial, with ever shifting relationships. I am reminded of the uncertainty principle of quantum mechanics, that I can know either the position of a particle or its momentum, but not both. We cannot ever 'precisely' know a socio-ecological system in its entirety and can only have increasingly precise knowledge for relatively smaller parts of the system. As wildlife health challenges expand then, how do we consider the broader socio-ecological system of which they are a part in order to tackle them?

Ted Alter observes that it is not a panacea, a guarantee, but acknowledging that human relationships and human-nature relationships in the midst of our differences are central to our ability to converse productively; understand complex systems; and to learn, create, and innovate will arguably strengthen our individual and collective capacity to address the disruptions we will face, disruptions which we know will occur but we don't know their when, where, or scale, and those disruptions we cannot even imagine. Our relationships must allow us to listen to and hear each other and listen to and hear nature.

Systems thinking allows us to contextualise the knowledge we have in the network of interconnectedness that is the real world. It allows us to live and make decisions based on that knowledge, not only for our own benefit but for the system as a whole, and by extension for the future. Systems thinking is a key tool, though not the only tool, by which society is enabled to tackle grand challenges, like those facing wildlife health. Systems thinking allows us to escape the prison of our own bounded sphere of experience and understanding to achieve a more holistic, collective comprehension of the system. It does this in practice through diverse and deep participation.

What is the role of wildlife health professionals in this participatory environment and how can animal health education programs prepare them for it?

My personal journey into systems thinking and participatory problem-solving, which has been experiential, has led me into a space of intellectual uncertainty, what I describe as an 'intellectual untethering'. The challenge for education programs and educators is to introduce a sense of knowledge humility to professionals, to allow them to accommodate other ways of thinking, other value systems, contested knowledge and competing priorities, while at the same time not devaluing their own thinking, values, knowledge and priorities. They need to appreciate both their own unique role as a participant and the diverse but no less important roles of other participants very different to themselves. They need to appreciate the limited knowledge-space that each of us occupies and the difficulty of perceiving other areas of

knowledge that lie beyond those limits. The importance of other participants and what they bring to *collective* understanding can appear, and remain, beyond our *individual* understanding.

The uncertain and contested spaces in participatory environments can be both confronting and liberating. They force us to let go of what we 'know' works and to accommodate the previously inconceivable. We relinquish the power of executive decision-making and accept that we each contribute a part of the whole. We hold our unique threads of experience and knowledge and, through the participatory process, weave those threads with the threads contributed by others and, rather than directing the outcome, we observe and learn from our collective weaving as the outcome emerges. Action and direction are achieved through discussion, negotiation, and collaboration. This participatory environment is contingent on all participants, including experts and professionals, acknowledging and respecting the human dignity of every other individual regardless of their position or station in life.

At some point in my career I accepted the status of 'professional' and 'expert', though have struggled to understand the legitimacy of that status. I have come to understand that those roles are assigned to me by society. They are conferred through the restricted processes of learning and ceremony I have been through - tertiary degrees, professional qualifications, peer-reviewed publications, promotion. However, on a deeper dive it is apparent that these processes and that ceremony is contingent on a social licence that is continually negotiated. I am an expert because my actions past and present reflect the social construct of that role. That introduces a future uncertainty, an impermanence, to such status, which is especially pertinent to contemporary debate on the role and influence of experts in society. We need to convey this relationship between society and status to emerging professionals and experts, so that they are better prepared to respectfully and effectively negotiate their future role as participants. This relationship is well described by Albert Dzur's concept of democratic professionalism.

How do we bring these concepts together in an educational program? As for socio-ecological systems themselves, there is no singular paradigm. The learning space is created by the participants, and the local context. David Kolb's Experiential Learning Theory may be an effective overarching method for educating concepts such as those described, which are diverse in both interpretation and practice. A combination of practice, reflection and theory (Figure 1) is likely to be most effective in acquiring understanding of both systems thinking approaches and participatory environments, including how to be an effective participant. We need to give wildlife health professionals the theoretical tools to critically reflect on experience but underpin that theory with genuine participatory experiences in which to learn and grow.

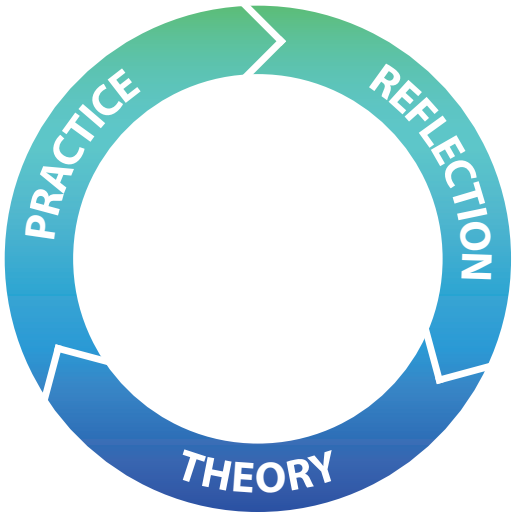

Figure 1. Simplification of Kolb's Experiential Learning Theory for the education of systems thinking and participatory problem-solving.

Ted Alter describes a constant dynamic interdependence between theory and practice; theory informs practice (behaviour and action) which in turn informs theory in a dynamic interdependent cumulative causative evolutionary trajectory. The best scholars and the most effective practitioners are aware of and immersed in this dynamic interdependence and embrace it as praxis, their praxis.

So, *what* practice? And, *what* theory?

Lisa Adams describes two of her key experiential learning opportunities. The first was a two-year, practice-focused course in group work leadership and facilitation at a private institute in her early thirties. This is when she got to experience new ways of learning and to unlearn a lot of what she had learned about becoming and being an animal health expert. She describes it as a confronting, humbling, rich and rewarding experience, personally and professionally. The second experiential learning opportunity came 15 years later, at a three-week immersive, residential program at Penn State University, in leadership in community engagement. The scholarship she was exposed to, combined with the mentoring and teamwork that followed with Ted Alter and others, gave her the confidence, mindset and language to work in different ways, and using the critical thinking skills and reflective practice that had already been fostered in her undergraduate, postgraduate and professional training.

The scholarship we have engaged with includes but extends well beyond democratic professionalism, causal layered analysis, the sociological imagination, institutional and behavioural economics, and participatory democracy. The point here is not that these areas of scholarship are critical, it is that systems thinking is critical; that there is no singular paradigm for approaching socio-ecological systems; that the criticality is in connecting theory, practice and reflection, as praxis; and that the learning space is created by the participants themselves

and the local context. So, what does this mean for educational programs, and university and community relationships?

Lisa suggests that within the wildlife health practitioner and scholarly community, and importantly beyond, there will be rich and diverse experience to draw on for considering future education programs. Thinking about education programs, the idea of systems thinking isn't new or radical, but perhaps how it is taught, and the types and range of scholarship explored in the process, could be. The range of program avenues could extend from storytelling or creating visual art, through to economic modelling and much more, introducing diversity in expertise, experience, expression and evidence of and for systems thinking in practice.

The words for 'listening' and 'thinking' are identical and closely related to the word for 'knowing' in Wiradjuri, as in many other Australian Aboriginal languages. This relationship is described by Miriam-Rose Ungunmerr-Baumann as the concept and practice of *dadirri* - deep listening. Deep listening offers perhaps a simple focus, in which our education programs guide wildlife health professionals to become better, as Ted suggests, at listening to and hearing each other and listening to and hearing nature.