

Enactivism: A theory enabling the creation of new knowledge within the framework of the Victorian Essential Learning Standards

The Importance of a Clearly Articulated Learning Theory

The Victorian Essential Learning Standards require pedagogy that enables connected learning: learning that empowers both students and teachers and thus enables the creation of new knowledge. An exploration and articulation of a relevant theory of learning and the adoption of theoretically consistent approaches to learning and teaching will assist teachers in enabling connected student learning.

Learning theory which best promotes connected learning is I believe, enactivism. The emerging theory of enactivism, which Begg (2002) describes as a development from constructivism, provides a sound basis for teaching and learning, incorporating the concept of 'power with' (student and teacher working together in community) and obviating the dualistic approach (an approach that enshrines 'right or wrong' and 'either-or') to teaching and learning that has dominated education in the twentieth century.

Parker J. Palmer (1998) encapsulates the unity of the concepts of connectedness, empowerment and learning by saying:

Good teachers possess a capacity for connectedness. They are able to weave a complex web of connections among themselves, their subjects, and their students so that their students can learn to weave a world for themselves ... The connections made by good teachers are held not in their methods but in their hearts—meaning heart in its ancient sense, as the place where intellect and emotion and spirit and will converge in the human self (Palmer, p.11).

How then does enactivism empower students to learn in a connected manner?

Enactivism

Education is the process by which individuals construct meaning so that they, as learners, "*might become fully alive human beings who contribute to a society of the common good*" (italics in original) (Groome, 1998, p. 72). The emerging theory of enactivism which understands cognitive and affective development as part of the transformation of an ecosystem, encapsulates this concept of becoming *fully alive human beings* and *contributing to a society of the common good* and so provides an apt and relevant base for learning which is connected and empowers.

Enactivism is a theory of cognition consistent with an ecological paradigm. It is grounded in an analysis of living systems and cognition (Whittaker, 1995) and emanates from a world view as described by Macy (1983). It stems from the premise that "cognition is a biological phenomenon and can only be understood as such" (Maturana & Varela, 1980, p. 7). Maturana and Varela describe knowing as "effective action, that is, operating effectively in the domain of existence of living beings" (Maturana & Varela, 1992, p. 29). They maintain that "cognition is effective action, an action that will enable a living being to continue its existence in a definite environment as it brings forth its world" (p. 29-30). "We only have the world we bring forth with others, and only love helps us bring it forth" (p. 248). Cognition is

not “a representation of the world “out there,” but rather an ongoing bringing forth of a world through the process of living itself” (p. 11). This is the process of transformation (Davis, Sumara & Luce-Kapler, 2000). Thus knowledge is defined as effective behaviour in a given context.

Self organisation or autopoietic theory, develops this understanding in the context of a system in which an organism engages with its environment (Whitaker, 1995). The identity of an organism is developed within the system. Systems that continually recreate themselves are defined as autopoietic, which involves acting to adjust to local conditions (Reid, 1998). This implies the interrelatedness of components of any system. Cognition is therefore understood by Maturana and Varela (1980) as inter-activity as “living systems are cognitive systems and living as a process is a process of cognition” (p. 13). The world we bring forth is done so in coexistence with others as “we are continually immersed in this network of interactions. Effective action leads to effective action: it is the cognitive circle that characterizes our becoming” (1992, p. 241). Effective action, or cognition is fundamental to existence. The understanding of ecological paradigm is foremost in the contemporary understanding of our world. The following areas are particularly relevant for education.

Contemporary world view

The emerging contemporary world view understands everything as interconnected. This world- view does not see physical life as disconnected, separate entities, but as entities that are interrelated.

“What had appeared before as separate entities dissolve into flows, and are seen to be patterns in these flows- patterns that sustain each other by means of their relationships and exchanges. Atoms, cells, plants, people, societies..... All are dynamic patterns, or open systems within systems. They influence each other so deeply that it is hard to decide where one leaves off and the other begins” (Macy, 1983, p. 119).

All of these systems manifest flexibility and intelligence and must integrate and differentiate. This involves a process that all must embrace in order to survive and develop (Macy 1983; Capra, 1996; 2003). Part of this interdependent process is to “engage and enhance their own and each other’s capacities” (Macy, p. 31).

The importance of interdependence is also emphasised in phenomenology where the relationship between the phenomenon, the world and the person are more important than the single entities (Merleau- Ponty, 1962) and in the development of complexity theory which states that systems, while consisting of parts are best studied as wholes, since new properties emerge that cannot be predicted by an analysis of parts (Capra, 1996; 2003; Lucas, 2000). As Aronson (1998) notes, systems thinking focuses on the interaction of parts rather than an analysis of the whole into parts. As the whole exhibits properties that are not evident in any of the parts, “the nature of whole is always different from the mere sum of its parts” (Capra, 1996, p. 29). Balance is the essential element in interdependence as life oscillates between perceived opposites within the nature.

Psychology

The understanding of the integral nature of connectedness and interdependence is carried into psychology through the *resilience literature*. The resilience research operates within an ecological model as it highlights the need for all people to belong. It has as its underlying premise that “we are all born with innate resiliency.....our inborn capacity for self-righting” (Bernard, 1996, p. 7-8) or “the ability to bounce back, recover from, or adjust to misfortune or change” (Burns, 1996, p. 94), or our ability to bungy jump (Fuller, 1998).

This research developed a list of *protective factors* and *risk factors*. Protective factors are “those factors that buffer against the stresses of everyday life that might otherwise result in adverse physical, social or psychological outcomes for youth” (Resnick, 1993, p. 3). One of these protective factors is *connectedness*. The term is currently defined as “A person’s sense of belonging with others. A sense of connectedness can be with family, school or community” (National action plan for promotion, prevention and early intervention for mental health, 2000, p. 123).

Brain Research

Recent research into the learning function of the brain has united body and mind in a way that obviates dualistic thinking. The term brain refers to the physiology of the brain and the term mind to its cognitive functioning. The brain engages with something that is new, relevant or dissonant (Fogarty, 2001). Consequently the brain only engages when it makes a connection to the proffered material. Making a connection necessarily involves the emotions. Once the brain is engaged and the material is in the short term memory there are two methods involved in committing it to long term memory, one is rote and the other is spatial or experiential.

Caine & Caine (1991) identified twelve principles of the brain and learning. These highlighted the engagement of the entire physiology in learning, the critical nature of the emotions in learning, the operation of the brain as a parallel processor and the uniqueness of each brain. In addition they identified several sets of dual functions of the brain, none of which can be valued at the expense of the other. The interdependence of all parts of the brain is demonstrated by research articulating the effect of the development of one or more disciplines on the development of others (Jensen, 2001). Jensen describes the brain as a “system of systems” (p. 72). The inescapable conclusion is that the whole must be developed and valued.

The Educational Setting

Enactivism is an emerging educational theory. Davis and Sumara (1997) developed the theory, reacting negatively to “the limitations of a mechanically based model of a complex human mind” (p.108) and to the consequent understanding of knowledge as something external that must be acquired. Learning occurs in context in all domains of existence and in an enactivist understanding, both the identity of the learner and the nature of the context change as the learning occurs, because “[e]verything is inextricably entwined” (p. 111). Thus “cognition is understood as embodied” (Davis, Sumara & Luce-Kapler, 2000, p. 66) as learning is holistic. Learning for Davis and Sumara is “participation in the world, a co-evolution of knower and known that transforms both” (p. 64).

Begg (2002) understands enactivism as “a recent development from constructivism” (p. 51). The development according to Begg, is in the understanding of learning as a complex emergent process taking place within a learning system that is dynamic and robust in adapting to changing circumstances. Davis and Sumara (2000) use the term “co-emergence” (p. 119) to describe the simultaneous development of individual and collective identities as the learner is part of the context rather than within it. This is closely aligned to Fullan’s (1999) understanding of a learning organisation “continuously acquiring and using new and better knowledge” (p. 15) as opposed to the acquisition of same. Consequently, the “link between cause and effect is very difficult to trace” (Fullan, 1999, p. 4) as this is acknowledged to be non linear. Davis and Sumara’s description of learning as complex rather than complicated, means it is consequently, somewhat messy, “less like General Motors and more like a town meeting” (Palmer, 1998, p. 101). There is a close connection here to the Vygotsky’s (1978) theory of the Zone of Proximal Development, which understands learning as a social phenomenon where the learning is scaffolded, and also to Bronfenbrenner’s (1993) understanding of the various contexts in which children develop. Enactivism, however, develops the concept of the complexity of learning beyond the social to the ecosystem, where the entire system is affected by the cognitive development of each individual (Davis & Sumara, 1997). Individual and collective identity is transformed and it is a viable system that values “the uniqueness of the individual” (Davis, Sumara & Luce-Kapler, 2000, p. 176). Cognition, thus, is broadened in its definition, to include, not only rational thinking but all forms of learning. This complexity has implications for teachers as learner growth must be the basis from which to operate (Begg, 2002). The teacher role then becomes one of co-learner and facilitator. This concept is also integral in the concept of lifelong learning (Wain, 2004). Unfortunately the tendency for the western thinking to involve dualities blocks the pathway to the holistic understanding of learning accessible through the theory of enactivism.

Dualistic and Holistic Thinking in our Educative Process

To encourage the full human development of each person it is necessary to “engage the whole person as an active participant” (Groome, 1998, p. 103) and understand the need to commit to the “*‘common good’ as integral with the personal good of their learners*” (italics in original) (p. 192). Our western patterns of thinking, inherited from Greek Aristotelian philosophy, which understood the intellect as in no way connected to the body, means that we have the strong tendency to value rationality above other (sensual) ways of knowing (Capra, 2003; Tarnas, 1996) and the external above the internal (Wilber, 1996). This thinking is consistent with a mechanistic world-view and means that knowledge, the learner and the world are understood as opposing forces (Davis, Sumara & Luce-Kapler, 2000). Thinking in dualities also means we categorise according to perceived opposites and find paradoxical thinking difficult, as we cannot accept perceived opposites together. Dualistic thinking so often translates to every domain of our existence, as we find ourselves repeatedly making choices on an either/or basis, thus ignoring the non linear nature of the operations as understood in complexity theory (Stacey, 1996). Often the elements of choice are not mutually exclusive and can and do co-exist harmoniously, reaping the benefits of this *modus operandi*. In many ways schools are endeavouring to engage the whole person and to understand the good of the individual and the common good as intertwined rather than mutually exclusive. They are, however, hampered by dualistic thinking, either chosen or imposed. This thinking thwarts the promotion of holistic approaches to education as it assumes the relationship between teaching and learning is direct, causal and linear (Petrosky & Delandshere, 2004). This thinking has been the most powerful influence in education in the twentieth century (Darling-Hammond (1997). An exploration of enactivism would highlight this dichotomy and enable a

re-thinking of the development of learning experiences that allows educators to develop practices that are theoretically consistent, and acknowledge learning as a complex web of interaction, where knowledge is understood as “contingent, contextual and evolving; never absolute, universal or fixed” (Davis, Sumara & Luce-Kapler, 2000, p. 78). Freire (1973) described the antipathy of empowering learning as a monologue. Davis and Sumara (1997) use the complement, conversation, when describing an enactivist theory of cognition. Davis and Sumara articulate four characteristics of conversational learning: The conversation:

1. leads the participants rather than they lead it
 2. unfolds within the reciprocal, co-determined actions of the people involved
 3. is a process of opening ourselves to others, at the same time as opening the possibility of affecting our understandings of the world
 4. facilitates a movement towards consensus among persons whose thinking/acting can no longer be considered in strictly subjective terms
- (p. 110).

Integrated Learning

Integrated learning is an essential component of the Victorian Essential Learning Standards (VELS) as the VELs enables the interweaving of previously discrete areas of learning. An integrated approach is a response to fragmentation of curriculum as neither students nor teachers live compartmentalised lives, but rather negotiate each day in a myriad of ways that reflect the context of their existence and their ability to learn in this connected environment. The Interdisciplinary Domain of Thinking Processes encompasses critical, creative and metacognitive thinking and links these explicitly to the creation of new knowledge (VCAA, 2005).

There are commendable approaches to learning and teaching used extensively in schools that are consistent with constructivist/enactivist theory and require an integrated approach. An integrated approach means students are “continually immersed in a network of interactions” (Maturana & Varela, 1992, p. 241) where they engage and enhance their own and each other’s capacities (Macy 1983, p.31). These approaches encourage students to take action to make their world a better place, become active citizens, become creative and critical thinkers, to be metacognitive and to self-assess (Baird & Northfield, 1992; Costa, 2004; De Bono, 1992; Fogarty, 1997; 2001; Holdsworth, 2003; Murdoch & Hornsby, 1997; Murdoch, 1998; Pohl, 2004). Teachers are encouraged to use these approaches and also provide variety for their students by designing curriculum according to the principles of Howard Gardner’s Multiple Intelligence Theory or Bloom’s revised Taxonomy, incorporate creative and critical thinking into classroom planning and be metacognitive and reflective learners themselves (Baird & Northfield, 1992; Costa, 2004; Fogarty, 2004; Pohl, 2004).

The articulation of these approaches is dynamic in that it implies the continuous process of ‘becoming’ rather than only acquiring knowledge (Begg, 2002; Davis & Sumara, 1997; Davis, Sumara & Luce-Kapler, 2000), which is ideally suited to an holistic, integrated approach: an enactivist approach. Unfortunately, an integrated approach is often relegated to the primary school. The concept in the secondary school setting is slowly becoming accepted. Slowly is the operative word. If teachers however, were more aware of the theoretical underpinning of the approaches they enact, this awareness may facilitate change at a faster pace; a change that is deeper and lasting for the whole school. What then, militates against the adoption of these approaches in their deepest sense?

Competing Theories of Learning

In a number of schools I believe learning theory remains unarticulated. This means that quite often competing theories of learning co-exist within a school. It may be cognitive dissonance that allows competing theories of learning to co-exist or the simply the fact that interest in the articulation and adoption of a consistent approach is lacking. Teacher understanding of learning may implicitly be constructivist or even enactivist, but they often use behaviourist (direct, linear) approaches because they either, have them imposed upon them or understand them to be executed more quickly and so to be more 'efficient'. This situation reflects the conflict between behaviourist and constructivist approaches described by Begg (2002) and the dualistic thinking that permeates our society (Palmer, 1998). As noted previously, dualistic thinking is the syndrome by which we categorise according to perceived opposites and so repeatedly make choices on an either/or basis, ignoring complexities within situations and the possibility of embracing these complexities and working with them, rather than against them. More often than not, the elements of choice are not mutually exclusive and can and do co-exist harmoniously.

A Way Forward: Enactivism

As there is confusion among the teachers a way forward may be, an exploration of enactivism. This exploration would highlight the dichotomy and enable a re-thinking of theory of learning and curriculum delivery that allows teachers to develop teaching and learning practices that are theoretically consistent, and acknowledge learning as a complex web of interaction. Enactivism, by its very nature, values learning in all domains of human existence. This is not necessarily true of constructivism, as teachers may apply constructivist learning only in a particular area.

Such exploration by the teachers would also enable organisational learning to increase. A complex web of interaction increases teacher capacity (Lodge & Reed, 2003) as all members of the web are equally valued. This is empowering for all stakeholders. An enactivist approach does not exclude teaching approaches that emanate from the understanding that the relationship between teaching and learning is direct, causal and linear (Petrosky & Delandshere, 2004), as sometimes this is an appropriate teaching approach. What it does however, is highlight that if used, this approach must still be learner-centred (Murdoch & Wilson, 2004). It is the learner who determines it appropriate or otherwise with the teacher closely and insightfully monitoring student choices and reactions.

If learning theory is re-explored in enactivist terms this would support the development of the whole child and delineate the school as a learning web, by:

- encouraging teachers and students to reflect deeply on their practice to understand the purpose of all actions
- encouraging teachers and students to research in their own classrooms and develop appropriate approaches to learning that value the development of students holistically
- supporting learning and assessment procedures that value all the domains in which students operate
- encouraging student self assessment in order to improve learning
- encouraging processes and procedures that obviate dualistic thinking

- valuing the rational but not at the expense of other (sensual) ways of knowing.

This is the manner in which enactivism addresses the pedagogy required for the successful implementation of the Victorian Essential Learning Standards. Enactivism explicitly, rather than implicitly, values learning in all domains. It is “effective action, that is operating effectively, in the domain of existence of living beings” (Maturana & Varela, 1992, p. 29). This understanding values a multiplicity of ways of knowing. In addition, teachers and systems would value assessment for learning, in performance, within a range of contexts, over time, rather than a single ‘snapshot’ developed according to very narrow criteria. It is the explicit valuing of learning in all domains and in many ways that enables an enactivist approach to be the ideal learning theory to underpin the implementation of the new curriculum framework.

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