An ecological lens on the professional development of university teachers

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ABSTRACT
This article presents an ecological frame for reflection on teaching at university. It is suggested here that the process of professional reflection on practice can be better aligned with processes of institutional development by applying the adaptive cycle. This heuristic emerged from the scientific literature on ecosystem maintenance and has been repurposed to allow the consideration of complex social-ecological systems – such as a university. The nature of the adaptive cycle changes over time to accommodate changes in the exterior (the institution and wider society) and interior (e.g. personal experience and wellbeing) professional environments. These cycling changes offer a descriptive tool to support discussion of university teacher development.

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Introduction

As part of the reaction to the negative influences of neoliberal discourses in higher education (e.g. Giroux 2010), the idea of the ecological university has taken a foothold within the literature (Barnett 2018), and an ecological perspective is employed increasingly within educational research (e.g. Chong 2021; Leijen, Pedaste, and Lepp 2020). The adaptive capacity of academics to cope with change within their working environment has always been a concern, for example to ensure that early career academics are not discouraged from working at university. Typically academics face a range of stresses and strains within their professional contexts as national economic and political climates impinge upon academic activity in various ways. In recent times the global pandemic caused by Covid-19 has resulted in members of the global community simultaneously facing the same problem as campuses were closed and teaching migrated to online delivery modes. Diverse stories have been collected about the ways in which academics have coped with this from all over the world (e.g. Jandrić et al. 2020, 2021). Application of an ecological lens offers a universal lexicon to consider the effect of this (and subsequent disturbances) to the university ecosystem.

Recently the literature on the ecological perspective has taken a 'process turn', in which the details of the dynamic processes of ecosystem maintenance have been
foregrounded as a focus for practical implementation of the university-as-ecosystem concept (Kinchin 2021, 2022; Kinchin and Gravett 2022). This turn in the literature has been underpinned by the application of the adaptive cycle (developed by Holling 2001) as a heuristic that supports a focus on a relatively small number of stabilising and destabilising dynamic processes to make the complexity of the ecosystem more manageable (Sundstrom and Allen 2019). Using adaptive cycles (Figure 1) as a frame for teacher development supports detailed discussion within the wider frame of the ecological university. This provides a point of departure from dominant perceptions of teacher development as a simple linear transition (from novice to expert), and shifts the focus to the dynamic processes involved in system maintenance.

An ecologically resilient social-ecological system requires a deep and constant engagement between individuals as a normal and established part of its activity. Crucially, this cannot be assembled reactively after a crisis strikes (Longstaff and Yang 2008), but needs to be an established function within the system. This engagement generates an understanding of the elements of the system, as a form of ‘institutional natural history’ (Kinchin 2021) that provides the knowledge base from which an understanding of ecological processes can be consciously developed among those involved alongside a collective consciousness derived from reflection on the logic of practice (Kinder et al. 2021). The central role of human actors in the educational ecosystem is described by Niemi (2016, 9):

An educational ecosystem is not a stable system. In contrast to a biological system, an educational ecosystem needs human actors, and it is dependent upon conscious human behaviour. For an educational ecosystem to be sustainable, its participants must intentionally share joint aims and take action to ensure interconnectedness, interdependence, and open and transparent mutual communication between all partners. In complex and moving systems, many of the components undergo their own change processes, and this information needs to be analyzed, updated and shared when working towards common goals.

Complex adaptive systems theory, viewed through the lens of the adaptive cycle, has been shown to be a valuable heuristic that can be applied to human behaviour (e.g. Randle, Stroink, and Nelson 2015). Those authors argue that human behaviour is a complex adaptive system that displays emergence and then follows the adaptive cycle. The

![Figure 1. The adaptive cycle. (Redrawn and based on Holling 2001).](image-url)
application of the adaptive cycle to consider professional development of university teachers is applied here for the first time.

An individual person can be considered a complex adaptive system (CAS) that moves around an adaptive cycle over a period of time. Each cycle passes repeatedly through four phases: growth ($r$), conservation ($K$), release ($\Omega$), and reorganisation ($\alpha$) (Figure 1). The growth phase is a period when resources are plentiful and those who are able, act quickly to take advantage of potential opportunities to dominate the system. The conservation phase is a relatively stable period of accumulation of capital. The release phase is when the functions of a system collapse and capital and connections bound up in a system are made available. Finally, the reorganisation phase is when the available capital (human, social, cultural, environmental, financial, etc.) and connections are exposed to new innovations and are reconfigured. The trajectory of the adaptive cycle alternates between the fore loop ($r$ and $K$), which is characterised by ‘long periods of accumulation and transformation of resources (from growth to conservation …’) and the back loop ($\Omega$ and $\alpha$), that is characterised by ‘shorter periods that create opportunities for innovation (from release to reorganisation …’)’ (Holling 2001, 394). In the fore loop, connectedness is increased, and capital accumulated during the relatively slow sequence from growth ($r$) to conservation ($K$). In the back loop, the system unravels quickly, resources are released and there is creative potential to explore innovations within the system. In the following discussion, the cycle and its four phases are used as a lens to describe and understand the non-linear professional development of university teachers. This assumes that interactions between academics in different university contexts comprise a complex adaptive system in which several separate human and socio-ecological systems are interlinked. Developing and adapting the structure used by Randle, Stroink, and Nelson (2015) requires a subtle shift in terminology – away from the clinical discourses of addiction and towards an academic discourse of professional independence. Building on this I hypothesise three separate but interconnected adaptive cycles to help understand the professional development of university teachers. These are an adaptive cycle of dependence, a transitory adaptive cycle, and an adaptive cycle of independence (Figure 2).

While the contextual details will vary from institution to institution and from academic to academic, the fundamental indicators of each of the phases within the adaptive cycle and the ways in which they will evolve with increasing agency are summarised in Table 1. Key to a successful transition from the transitory cycle to the independent cycle is the acknowledgement of dialogue, support and guidance that may come from academic developers or from near peers within the individual’s department.

**Adaptive cycle of dependence**

Novice academics are initially dependent upon their managers and mentors to help them navigate the tensions of working in higher education, and to manage the demands that are placed upon their time. Particularly when new colleagues are in their probationary term, they feel compelled to accept the dominant wisdom of the group in order to align their actions with those of their near peers. The pressure to fit-in and to be accepted is not trivial and will often drive the actions of newly appointed university teachers. However, it is also evident that the early years of an academic career are extremely stressful, and many colleagues can be observed to adopt strategies of short-term survival rather...
than long-term strategies that will help them grow professionally. Once the pattern has been set, it is difficult to break free and colleagues can find that the strategies adopted for short-term survival contribute to the stresses of the job. For example, traditional ‘tell-em and test-em’ teaching strategies are easy to establish but place ever increasing burdens on the teacher to ‘perform’ in ways that will be measured and assessed. More active and student-centred teaching methods may take longer to develop and require greater initial investment, but are ultimately more sustainable and (arguably) more satisfying. This involves investment in the scholarship of teaching that the new appointee may feel is beyond them at the outset of their career when everything is new. Without seeing the benefits of other ways of working, the stresses of the job may bubble up from a point that is kept ‘under the threshold of consciousness’ (as described by Erlandson 2016, 254). The essence of this adaptive cycle of dependence is described by Randle, Stroink, and Nelson (2015, 85):

despite the ever-increasing negative consequences associated with [dependence], the individual persists in these behaviours unless he or she can move past the rigidity trap in the conservation phase and release tied up resources into the exploration and adaptation to more positive behaviours that move the person away from [dependent] behaviours. Thus, in the release phase, there exists the potential to shift the behavioural pattern into a new, healthier, adaptive cycle.
The rigidity trap in academic practice can be observed when academics continue to engage in teaching practices that run contrary to the available evidence and may even be in conflict with the beliefs of the individual academic. This is why we continue to observe classrooms that promote passivity and teaching that promotes non-learning (Kinchin, Lygo-Baker, and Hay 2008), even in the face of evidence that supports the application of active teaching and meaningful learning (e.g. Freeman et al. 2014; Maton 2009).

**Table 1.** Characteristics of each of the phases of the adaptive cycle at different points along the evolution of increasing independence.

| Phase       | Dependent cycle                                                                 | Transitory cycle                                                                 | Independent cycle                                                                 |
|-------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| **Release (Ω)** | A disturbance is seen as a unique event that may present an insurmountable obstacle. | Individuals cope with some discomfort while relinquishing some initial assumptions. | A disturbance is seen as one event in a long sequence of navigable disturbances. |
| **Reorganisation (α)** | The individual is dependent upon others to fill procedural gaps and develop short-term solutions. | Individuals are engaged in dialogue within a network of support to recognise a variety of possible responses. | Individuals draw on professional assets and accumulated resources to overcome problems. Offers guidance to others. |
| **Growth (r)** | Follows a trajectory that may be at odds with the individual’s professional values. | Involved in identifying possible trajectories for development, but needs guidance from peers on implementation. | Sets an independent trajectory based on professional values. May be seen as a leader. |
| **Conservation (K)** | Unrealistic expectations of environmental stability while assuming a fixed endpoint for development. Assumptions based on engineering resilience. | Recognises the rigidity trap. Feelings oscillate between nostalgia and anticipation. Requires support to move from engineering to ecological resilience. | Seen as a temporary phase that will eventually be replaced—offering fresh opportunities for innovation and development. Appreciation of ecological resilience. |

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**Transitory adaptive cycle**

This cycle is described by Randle, Stroink, and Nelson (2015, 85) as occurring when ‘important controlling variables within the individual’s life undergoes some form of change and eliminating previous system structures becomes necessary’. The cycle is characterised by high connectivity between reliable positive supports. For the novice academic, this may include links between the activities and mentorship within the department, along with more centralised university support in the form of teacher development programmes. To engage in this cycle, there has to be a shift in internal capital, that may include a stronger sense of self and a clearer professional identity that offers greater professional agency. This needs to be supported by opportunities for critical reflection. The adaptive cycle offers an additional frame for the iterational, projective and practical-evaluative reflection described by Leijen, Pedaste, and Lepp (2020), and so link patterns of thought from the past with the academic’s capacity in the present, and short- and long-term aspirations for the future. The adaptive cycle has the potential to incorporate the reflective cycle over time (Palacios, Onat-Stelma, and Fay 2021) in a way that overcomes the problem of linearity and the false promise of a stable end-state that is suggestive of linear models.

The individual’s development at this stage relies heavily upon there being some perception of stability in the system and some degree of coherence across the institution (Kinchin 2021). In other words, teachers and managers need to be ‘singing from the
same hymn sheet’. A lack of coherence will introduce unproductive tensions that emerge from an institutional pathology borne of fragmentation and competing agendas (e.g. Wright and Greenwood 2017). Movement to the next adaptive cycle requires an environment that offers a degree of pedagogic health (Kin chin 2019), in which innovation and diversity of thought are valued. The transitory adaptive cycle is, in many ways, a fragile state and cannot be maintained indefinitely. If it is not supported, then the individual is likely to relapse into a cycle of dependence. If development is to be maintained, then it must eventually shift into the adaptive cycle of independence.

**Adaptive cycle of independence**

The third cycle is where the individual academic seeks to maximise the ecological resilience (sensu Holling 1996) of their practice. Ecological resilience is less about enduring everything that is thrown at you in a hostile environment (i.e. coping with adversity) and more about manipulating the environment so that it becomes more livable. That is, to develop agency by utilising ‘the interplay of individual’s capacities and environmental conditions’ (Priestley, Biesta, and Robinson 2015, 3). Here the academic widens their support network so that they rely less on the mentors and academic developers who guided them at the outset of their careers, and to be less bound by set processes and procedures that support an economy of effort in teaching. There is a greater focus on factors that are within their control, such as the enactment of a personal philosophy of teaching; engagement with the academic community, and a focus on self-care as a prerequisite to becoming a caring teacher (Kin chin et al. 2021). This third cycle is a more ecologically resilient system than the preceding two cycles and can not only tolerate but thrive on uncertainty and diversity as part of a process of professional becoming (Strom and Martin 2017). This is in contrast to engineering resilience (described by Holling 1996) that assumes the existence of a stable end state – that is, a static state of *being* rather than a dynamic state of *becoming*.

**Using the adaptive cycle as a tool in academic development**

The adaptive cycle can be used as a tool in the academic development of university teachers – formally or informally. The representation of the adaptive cycle in Figure 3 has been found to help colleagues to reflect upon the way they have coped with the disturbances caused by Covid-19 over the past two years. Starting with the Covid-19 prompt on the right-hand side of the diagram, colleagues were asked to write a personal commentary about the ways in which they reacted as lockdown restricted their activities (i.e. the release phase). This included their emotional responses as well as any practical responses. Following this, they were asked to reflect upon the ways in which their activities were reorganised – whether there was a coordinated response or if they felt they were left to sort things out on their own. Moving on to the growth phase, colleagues were invited to thing about the ways in which activities ‘settled down’ and a new working pattern emerges. Whether they were comfortable with new working practices and how this aligned to their own professional values or philosophy of teaching. Finally, they were asked to consider their aspirations for the next conservation phase – whether they thought it would represent a return to the status quo, or if some changes were
here to stay. Indeed, some colleagues ventured that some of the changes that were enforced by Covid-19 were actually an improvement upon the previous ways of working. While the details of what was written by individuals in this initial trial will remain confidential, some colleagues offered the opinion that the process was helpful to marshal their thoughts and to make sense of what had been a very stressful time. Ongoing studies at this institution will investigate this further and will aim to identify which phases of the cycle are most problematic at different levels of independence.

**Conclusion**

The ecosystem is seen by Golley (1993) as a bridging concept between disciplines that helps us to appreciate how humans should relate to each other and to the environment. In so doing, it focuses our attention on the foundations of a relational pedagogy (Bingham and Sidorkin 2004), and the promise of a more sustainable pedagogy (Sandri 2020). An individual’s adaptive cycle operates within the context of numerous other adaptive cycles that function at various scales within the institution – a nested system described as a panarchy (Allen et al. 2014). In addition, an individual’s adaptive cycle affects, and is affected by other adaptive cycles. Many of these will cycle at slower speeds. These may be ‘professional cycles’ that might include academic communities and organisations, as well as ‘personal cycles’ that might include family life or health issues. The cycle of independence is not a fixed end state. It is a dynamic cycle like those that precede it, and it is always becoming other as the cycle interacts with cycles above and below it in the university panarchy.
Representing teacher development as a series of cycles is akin to the description of plateaus in a rhizomatic structure (Deleuze and Guattari 1987), where each plateau (represented by each of the three cycles) is not a fixed stage, but rather:

a plateau is reached when circumstances combine to bring an activity to a pitch of intensity that is not automatically dissipated in a climax – leading to a state of rest. The heightening of energies is sustained long enough to leave a kind of afterimage of its dynamism that can be reactivated or reinjected into other activities, creating a fabric of intensive states between which any number of connecting routes could exist. (Massumi 1992, 7)

Conceptualising personal development as a series of adaptive cycles allows the developing academic to place themselves into the wider ecology of the university (itself consisting of an assemblage of adaptive cycles), and to recognise the universality of a philosophy of becoming and its benefits when considering teaching (Strom and Martin 2017). However, it is important to realise that the three cycles described above do not represent a fixed linear sequence of development (as movements can be ‘up’ or ‘down’), and that each individual could be represented using a variety of ‘professional’ cycles (representing the development of teaching, research, leadership, administration etc.) alongside ‘personal’ cycles of life outside of work. Each of these cycles is liable to disturbance that might trigger a release phase at any time. In addition, the larger cycles that depict the activities of the department, the university (or the country) are also liable to unpredictable change, as has been experienced recently by the disturbance caused by the Covid-19 pandemic.

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