

Developing public service knowledge and learning about complex systems: using a community of practice to integrate theory and practice

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Abstract: A Community of Practice Knowledge Exchange (CPKE) comprising of practitioners and academics with an interest in complexity theory was formed. The central activity of the CPKE was an agreement that each would develop a case study that integrated complexity theory and challenges in practice. In the first phase, members agreed definitions of core concepts and used them to describe the systems they were working in. Frequent contact was via a virtual learning environment. This activity was supplemented with face-to-face contact, in the form of half-day workshops. After several months, the CPKE agreed two core pieces of reading to provide a theoretical basis. These were popular because of their applied focus. The CPKE evolved to a second phase. Diverse case studies of practice-based challenges were used to share experiences of complex systems. A key event was the presentation of case studies as complex systems using a shared conceptual language generated by earlier learning. In the final phase, the CPKE considered interventions into the case studies and created and applied a management toolkit to develop approaches to possible management interventions. Through the development of the toolkit, the CPKE became interested in the role of values in a complexity-based practice and how coherent and shared values could aid more informed interventions. The use of complexity theory changed the ontology of management practice by facilitating an understanding and acceptance of uncertainty and that optimal approaches often required a relational and cooperative approach built on shared values, rather than an instrumental and singular management orthodoxy.

Keywords: Communities of Practice; Knowledge Exchange; Blended Learning; Complexity Theory

Introduction

Complexity theory had been taught by several staff in the School of Applied Social Science at the University of Brighton since the late 1990s, across a diverse range of courses, including public policy and management, social policy, and social work. The main early focus in this learning and teaching was on the relevance of complexity theory to forms of social practice, including public management, social policy, and social work. Content was first developed for a postgraduate certificate in Public Service Management, from 2003, and – in the same decade - the MA *Public Service Partnership*. These qualifications were replaced by an MPA in 2007.

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In 2007, several staff engaged in this activity began to meet specifically to share their current experiences of using complexity theory in learning, teaching, and research. At this stage curriculum interventions were largely focused on occasional specialist lectures and seminars on generic courses, these teaching sessions offering an alternative and critical perspective and highlighting some of the important new theoretical texts becoming well known at this time (Byrne, 1998; Cilliers, 1998).

Several staff in the School had started to present papers and to publish in this area (Haynes, 2003, 2008; Stroud and Warren Adams, 2013). Resulting discussions in the local academic community included mapping the emerging theoretical framework. A connection was also made with a colleague at the Brighton Medical School (BMS) (see Price et al. 2015). A small community of practice (Wenger, 1998), at first entirely based in the local academic community, was established to share experiences of the use of complexity theory and how it was informing curriculum and research developments. A community of practice has been defined by Wenger (1998) as a group of likeminded people who share an enthusiasm and commitment for elements of their practice and want mutual support to improve the performance of their practice. Communities of practice often experience a strong sense of shared professional values. The group were also influenced by Problem-Based Learning (PBL) as this had been taught and practiced by the academic staff with an interest in complexity theory. Problem Based Learning is a learning participant centred approach to teaching and learning (Savin-Baden, 2000). Participants learn by sharing open-ended problems, often through real world case studies, and seek to address issues by using a variety of information content alongside their own and other's experience.

In 2009, Haynes led a bid for development funding, on behalf of this small academic group. This was in response to a call from the UK ESRC to bid for funding for Knowledge Exchange. The UK research council was seeking to fund work that could articulate the scope of areas of new academic theoretical work that was beginning to have public impact, including in areas of social and professional practice. The call was an ideal opportunity to take forward the aspirations to do more with integrating complexity theory with innovations in practice. In late 2010, an award was made to fund a project at the University of Brighton, entitled: *Systems and Complex Systems Approaches in Public Policy and Practice: A knowledge exchange between academics and practitioners* (RES-192-22-0083). This project provided an important pilot for action learning between academics and public managers and professions. The ideas learnt were pivotal in developing aspects of the curriculum on the newly evolving MPA.

Aims of the project

The funded project aimed to create a more substantial community of practice whereby academics would meet equally with social practitioners. This was to be a forum for collaboration in policy analysis and public management development. Building on the social learning theory and practice of Wenger (1998), it aimed to take place in an equally shared professional space, occupied by both academics and practitioners. By enabling practitioner input to the critical reflection about complexity theory and its application, academics sought to harness theoretical insights, identify policy, and practice solutions, and devise best practices for learning, teaching, and research. The outcomes were to improve academic and practitioner understanding about complexity theory, to develop working tools for public policy makers, managers, and professionals, to provide specific developments for the higher education public policy and management curriculum, and to enable wider national and international dissemination of findings when the project finished.



A post hoc evaluation of the funded project identified that learning in the Community of Practice Knowledge Exchange (CPKE) had taken place in three phases: formation and induction, using theory to describe policy and practice, and using theory to intervene in policy and practice. Beyond this was the wider and long-term impact of the project, in terms of its influence on university teaching, research, and consultancy. It is important to note that these phases were not planned into the project, *ex ante*, but emerged through the participatory approach to facilitating the community of practice.

Phase 1 Formation and induction

The academic and community partner team responsible for winning the grant funding were the founding members of the CPKE. Further participants were recruited through an external website managed by the University's Community University Partnership Programme (CUPP) and via direct requests for practitioner participants from public bodies that had supported the project concept. This included reference to the support available such as covering expenses and providing reading and information support via university library and information services. Those expressing an interest were contacted by the project lead to make sure they had a full understanding of the project's aims and what would be the responsibilities of a member who joined. Given the degree of commitment required to join, this meant that some interested parties did not feel they had adequate time to give to become members.

Twenty-four participants were successfully recruited. They represented public service providers, voluntary and community organisations and university staff/research students. A good balance of academics and practitioners was achieved. Once new members with no formal link to the University had been enrolled as community academic fellows, to give them access to the necessary information systems, the community was closed to outsiders, and all those enrolled invited to an induction event.

Several members identified themselves as both academics and practitioners with dual professional roles. The duality of these members varied from those who were working in two, part-time jobs, one as an academic and one as a practitioner, to those whose major role was one or the other; for example, a practitioner who was also an occasional visiting lecturer at the University. The large number of these overlapping roles meant that that any simplistic division of academic and practitioner was far from the experience of most members of the CPKE and not usually presented as a duality in the day to day experience. For example, those with major practitioner roles often made significant and leading contributions to the conceptual definitions, but perhaps with a more example-based approach, rather than starting with an abstract definition of a concept.

The CPKE agreed their emergent and evolving learning and development process through a process of active participation. At the face-to-face induction, all participants were encouraged to explain their interest in complexity theory and to indicate what they hoped to gain from being involved in such a developmental and learning process. All were expected to join a closed virtual learning environment managed by CUPP. The induction included training into use of the virtual leaning environment and opportunities to try it out with specific exercises. Each person who joined the community of practice agreed at the outset to develop a case study where they would attempt to integrate theory and practice. It was also agreed that the final case studies were to be presented at a closed conference that included an evaluation of the project.



During the first phase of the project, members shared ideas for reading and gradually agreed on some core reading. The reading activity was used to facilitate an online process whereby members shared core concepts from complexity theory, and sought to identify examples from their research and practice and then to agree core definitions. At the end of this phase, two pieces of reading that had been used in the process were agreed as ‘most influential’ and conceptual definitions used in phases 2 and 3, largely came from these two sources (Meadows, 2009; Snowden and Boone, 2007). This first phase of the project had rapidly established a closed community of practice in a three-month period and this enabled it to provide a Knowledge Exchange (KE) for sharing ideas about systems and complex systems between academics and practitioners. This was the beginning of reflection on how theoretical ideas were best integrated into practice. The CPKE had some initially difficulty in agreeing abstract definitions of key complexity concepts, but when the CPKE moved to consider descriptions around real living systems, the definitions became focused on working examples. Seeing the practitioners as equal learners enabled the academics to focus on conceptual definitions that were not too abstract but rather grounded in real world examples.

Phase 2. Using theory to describe policy and practice

In the second phase, the CKPE sought to describe public and voluntary organisational systems they were involved in, using the concepts that had been explored and defined in the earlier community activity. Each member was asked to present a case study from policy or practice and then to describe it as a complex system using the agreed theoretical framework. A face-to-face learning day was used for each person to share their case study and to gain peer assistance in constructing it as a complex system. The case studies selected by the participants were diverse. They included macro policy issues like the economy and public finances, and national energy policy, but also local examples of specific provider services in both the statutory and non-government sectors. Examples were how regional and local government could best support changing local dynamics in tourism, how social workers best respond to risk in partially closed family communities, and how an urban community centre could adapt to meet growing and changing social needs caused by government and economic failures. All participants used diagrams to explain their system case studies. Although no fixed diagrammatic methods were prescribed by the project, it was apparent that the diagrams developed and presented used similar symbolic representations to each other. For example, lines with arrows to show the flow of processes and activities, and boxes to indicate fixed point events or groups of actors (like parts of an organisation or team). The scale of the diagrams varied considerably depending on whether the participant was interested in macro, meso or micro level system behaviour. Some diagrams were monochrome while others used the addition of colour. These diagrams bore similarities to those used by historical soft systems approaches to management decades earlier, but no direct connections had been made by the CPKE with this field of publications (e.g. Checkland and Scholes, 1990).

Phase 3: Using theory to intervene in policy and practice

In the third phase, having shared the case study descriptions, the participants agreed to work on implementation plans for their systems. In effect, they would map possible interventions onto



their system descriptions and consider with the CPKE the likely implications for attempting these different interventions.

One early group exercise was used to consider a hierarchy of management interventions. The most influential text for this development was Meadows (2009). From this, the CPKE identified seven core aspects of management intervention: resources and their use, identifying change, using information, setting rules, understanding self-organisation, directing the organisation by giving it purpose and radical change based on strong core shared goals and values. The community decided that the values and realism of a complex system approach to management should result in a radical model that reversed the likely focus and ordered use of these interventions, as indicated by the direction of the arrows and the order of the management actions in table 1. Therefore, influenced by Meadows' (2009), observation about the transformational impact of changing values, and strategic goals clearly aligned with values, there was an appreciation by the CPKE that culture and values are deeply ingrained elements of public organisational systems and that there are often the hardest aspects to change. The presentation of the toolkit (table 1) invites users to 'turn the kit on its head' and to start with cultural interventions from the 'bottom up'. Building team and organisational cultures and making them resilient through adaptability was argued to be at the core of a management practice that uses the insights of complexity theory. This can only be done by an interactive process whereby managers and leaders are constantly communicating and sharing messages with all staff. Several members have since presented the toolkit at conferences and similar, and it has influenced other publications (Price, et al, 2015).

An agreed and popular method for mapping interventions onto the existing descriptive system diagram was to use Post-it@sticky paper notes. Each note represented a different idea for an intervention. The ideas for interventions were much influenced by Meadows (2009) ideas about how best to intervene in systems. Popular examples were: the use of stocks and flows of resources (including human resources); the use and presentation of information into specific parts of the system (to attempt to increase certain types of relational feedback); and modifying system rules. Also popular was encouraging reinforcement of what was seen as helpful and functional self-organisation in one part of the system, by providing reinforcing information about it into another part of the system. There was also some more fundamental discussion about how to alter the overall trajectory of the system by changing its values and objectives, but given the macro and holistic aspect of this, it was difficult to summarise such possible transformations on the diagrams.

On the final meeting day for the CPKE, when each of the case studies were presented, a rich variety of interventions were in evidence, with much discussion and debate among the CPKE members about the likely possible outcomes of such interventions, if they were to go ahead. The CPKE agreed to publish the final toolkit, to make it available for future education, training and consultancy, and to promote the impact of the KE via an externally facing website (<https://www.brighton.ac.uk/ssparc/research-projects/the-brighton-systems-knowledge-exchange-project.aspx>). The Complex Systems Toolkit was designed to assist public policy and management students in developing an integrated approach to public management that is systemic in its approach. Table 1 summarises the toolkit (The full package is available at <https://www.brighton.ac.uk/ssparc/research-projects/the-brighton-systems-knowledge-exchange-project.aspx>).



The project evaluation

At the conclusion of the project, there was an evaluation conducted by all those involved. Members expressed a desire to continue their learning and those not based in the University were concerned about how to make the online learning environment simpler to use and more intrusive (to remind members to participate). Some felt that it needed to be connected to a personal e-mail address as a more regular *aide memoire*. Some felt that if the same kind of community of practice was attempted in the future the emphasis needed to shift more from online learning to additional face-to-face learning sessions. Practitioners were keen to have occasional invites to share their knowledge at the University, for example as visiting lecturers and to some extent, this proved to be possible. All felt that the project needed to be simply recorded and presented as an external website and this was achieved. The involvement of practitioners in the action of learning about theory was an essential element to the success of the project, it moved beyond theoretical debates about abstract concepts to real world policy and management issues and decisions. A key part of the success was seen to be that the phases of the CPKE were participatory and emergent, in that every three months all members reflected on the direction of the project, its progression and how it could ensure it achieved its final goals. A historical analysis of the working of the CPKE identified the three key stages in the process, but these were not planned. They emerged through the participation. This emergent structure and process was closely linked to the overall demands of the project and the expectations that were set at the induction phase and the role of the principal investigator and project administrator in reminding the participants of the importance of the focus of the original goal to integrate theory and practice and to develop case studies.



Table 1

The action and intervention toolkit





 <p>Radical 'Public Value' Approach</p>	<p>A. Resources and their use <i>Inputs and their use and flows in the system Identify any blocks in system flows Build stocks and reserves as buffers Develop resources (including staff development) Analyse workflow and work process [see Seddon's (2008) work on demand failure]</i></p> <p>B. Identify types of change <i>Feedback that reinforces itself, often exponentially Feedback that has implicit or explicit controls on it Unmanaged change versus managed change</i></p> <p>C. Use of Information <i>Information about the system, its analysis, and 'active ' or 'passive' communication back into the system</i></p> <p>D. Setting the rules <i>Explicit rules and their effects Implicit rules and their effects Subversion of rules- effect of Deciding to change the rules</i></p>	<p>Traditional Management Approach</p> 
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Table 1 (continued)

The action and intervention toolkit

	<p>E. Empowering Self Organisation <i>Understanding the power of self organisation, its functional and dysfunctional effects</i> <i>How can we empower the best aspects of self- organisation?</i></p> <p>F. Directions and Purpose <i>The ability to generate shared goals, aims and objectives as powerful tools of change - the link with values and cultures</i></p> <p>G. Radical Change</p> <p><i>Building core and primary values that enable a critical sense of the priority issues that need action</i></p> <p><i>The ability to generate shared goals, aims and objectives as powerful tools of change - the link with values and cultures</i></p> <p><i>Building core and primary values that enable a critical sense of the priority issues that need action</i></p>	<p>Traditional Management Approach</p> 
<p>Radical 'Public Value' Approach</p>		

Discussion and Conclusion

Formation and induction of the CPKE

While the funded CPKE included a strong online element to enhance regular and flowing communication, it also included some clear stages for the community to regroup around face-to-face contact. These events proved especially important in critically reflecting on the community's own learning process and agreeing how it should progress. The evaluation provided strong feedback evidence that this was a collective shared view and that if the community had been constructed entirely online, the full dynamics and momentum of the community and its learning progress would not have been possible. This provides evidence of the importance of blended learning and the limitations of distance learning that is entirely online. The latter often experiences problems with motivation, commitment, and progression, as is well documented (Bach et al, 2007).

Using theory to describe policy and practice

An important aim of the funded knowledge exchange was that it required an approach to theory that was grounded in practice-based case studies and therefore assisted in moving the academics from a preoccupation with a debate about the definition of abstract and meta theory. Previous scholarly work in the application of complexity theory to the social sciences had focused on issues relating to the importing of theoretical ideas from the physical sciences into the social sciences and the validity of the resulting theoretical framework and concepts (Byrne, 1998; Klijn, 2008; Teisman & Klijn, 2008; Teisman, van Buuren & Gerrits, 2009; Byrne & Callaghan, 2013). There had been (and continues to be) some concern about the reliability and consistency of complexity concepts in the social sciences with different definitions sometimes being applied in different disciplines and circumstances. At first, there was a lack of empirical and practice-based work to illustrate the usefulness of the theory. In part, this was because of the meta theoretical nature of complexity theory and its holistic and integrated approach to social sciences. The requirement built into the funding bid that the closed community of practice consist of an equal focus on theory and practice and academic scholarship and public practice ensured that the scholarly work had to articulate its theoretical narrative into a real-world setting.

The project ran concurrently with a developing international use of complexity theory in public management that increasingly focused on an organisational systems narrative and this was an important influence on the direction that the project and its later influence on curriculum took. The *turn to complex systems* (Byrne, 1998; Cilliers, 1998) in the applied social science approach to complexity theory provided more emphasis on practice (Klijn, 2008; Rhodes, et al, 2011), and loosely connected the complexity approach with a range of contemporary approaches to applied systems theory in management (Seddon, 2008; Rhodes et al, 2011; Allen, et al, 2011).

Using theory to intervene

Previous public policy scholarly work (Hill, 2005) had argued the importance of a theoretical framework in public policy and administration that could clearly separate description and



prescription. It is one thing to be able to define a complex policy and organisational environment, in order to categorise it and make sense of it. It is another matter to be able to intervene in this complexity with some degree of confidence and to claim that one at least in part knows what one is doing. Of course, the need for humility in intervening in complexity is one of the primary insights to have emerged in the turn to complexity and complex systems, and this was certainly a feature of reflections in the community of practice documented here (Klijn, 2008; Etzioni, 2014; Byrne, 2014).

These insights about the use of theory in practice proved a critical part of the discussions in the project CPKE in phase 1 when it was seeking to get beyond debates about the boundaries of complexity theory and the nature and definition of its primary concepts. Clarity around the differences between adequate description and reflection as contrast to the challenges of intervening in working public system were pivotal in moving into the second and third emergent phases of the learning community process. The conclusion of the learning here was not negative or overly cautious, nor indeed was it that ‘nothing works’. Rather, it was that intervention is as much of an art as a science and that *how* things are done, is of as much importance, as *what* is done. Relational and communication issues were often expressed as central in complex systems although these were difficult to capture in conventional approaches to organisational and systems based diagrams and models.

The ultimate test of theorising complexity in public policy and management is the usefulness of the concepts to the art of practice. The academic members were pleased by the ability of the community in the final phase of the CPKE to articulate together the integrative management model in the toolkit (table 1). This provides evidence that a complex systems approach to public management can be juxtaposed in relatively straightforward ways with some existing management approaches, especially those that are integrative and abstract by nature of their meta approach (i.e.: the management of change, and strategic management).

Perhaps, what was more surprising and radical in the development of the toolkit, was the desire to place public values at the centre of public management and to see values as a major element at the core of any public policy system. Coherent values were seen as essential to such a system if it was to be functional and have operational chances of ‘success’, in terms of improving the quality of public life. This element is more novel and distinct when an integrative complex systems approach to management is compared to other major integrative approaches like managing change and managing strategy. While values may well play a role in these latter practices and how they are modelled (for example, values are at the centre of visionary approaches to strategy) they are by no means always at the centre of previous integrative approaches. The desire for values to be the kernel of a complex systems model of practice was perhaps the most interesting outcome. In this community of practice experience, this was influenced by the popularity of the Meadows (2009) approach with practitioner members, and the fact that Meadows’ original systems synthesis of environmental issues was values based.

For example, one of the partners who joined the CPKE was a service manager at an adult learning organisation based in a socio-economically disadvantaged area of their city. They came to the knowledge exchange with a case study concerning how to manage the multiple requests for data they received from funders (a situation familiar to many non-government organisations). Their main concern was how to maintain the dignity of clients who were required to answer multiple, often personal questions in order to satisfy funder data requirements. The data requested was of little use to the organisation; it served their funders monitoring requirements



but did not constitute helpful feedback for them. Using Meadows (2009) concepts, they identified requests for data as an excessive flow of information. In order to intervene in this situation they identified the need to assert their value position to funders which they described as 'evidencing what we do in a dignified way'. Affording their clients dignity became a value position around which they sought to reorganise information management needs in their organisation.

The practice discourse of primary interest to the CPKE approach could be summarised as: an acceptance of the limitations of a mechanistic approach to cause and effect management approaches, and an appreciation of peer approaches to reflective decision making. This was a collaborative approach to dealing with complex issues. It maps with what Snowden and Boone (2007) have called the 'complexity domain'. While the dynamic values influencing public managers at the cognitive and micro levels are in themselves complex and changing (Box, 2015), they also interact with a more instrumental meso and macro holism of applying public value to defined policy outcomes (Moore, 1995; 2013). These two approaches, while originally defined separately in the literature, are also increasingly discussed and debated together and argued to be connected (Haynes, 2017). The nature of these connections and how they evolve in policy and practice over time needs more empirical research, but such a framework of entangled cognitions and cultures is itself a manifestation of a complex social system.

Conclusion

In the subsequent years that the learning method here and the toolkit have been applied to the MPA, values have remained a central and important element to student participants. This influence of values has in the last decade been commensurate with a *turn to public values* in public administration scholarship, and identifying and specifying the diverse public values of practitioners in the public services Box, 2015; Bryson et al, 2016; Haynes, 2017).

During the CPKE and in subsequent teaching practice, the use of complexity theory in public management moved somewhat away from a science-based method towards a philosophy of practice. Here the approach is less about diagnosing what multiple methods can best detect the complexity of process and service production, but has become much more about actors acknowledging together the wide-ranging challenges and instability of the world in which they operate and that relational and supportive practices are needed that address the scale of these complex challenges.

Our experience in working with practitioners to solve complex problems in the public domain is that an appreciation of complexity theory and its concepts drives a change in perspective. Together we came to accept that an element of uncertainty is inevitable, but to realise that it is the product of our dynamic, interactive, and innovative society. This results in a rather different ontological perspective to the previous historical approaches of rational and predictive management science.

A key challenge after the conclusion of the funded and closed community of practice was how to ensure the learning was appropriately translated to other settings. Discussions about the most appropriate place to include it, in a contemporary MPA curriculum, focused around the interactive action learning benefits of the process experienced by the funded community of practice.



The three phased methods identified by *post hoc* evaluation of the CPKE were subsequently implemented in the University of Brighton MPA where it became a core element of the module *Strategy and Planning in the Public and Voluntary Sectors*. It has run numerous times in this context and has evaluated well by students on each occasion. In particular, students liked the integrative nature of the exercises and saw it as a good evaluation tool to use before considering new strategies and change processes. The method was also influential on the development of the second edition of *Managing Complexity in the Public Services* (Haynes, 2015) and in particular the chapters on performance and strategy. The toolkit has been further articulated and explained in Price et al (2015).

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