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Framing Systems Thinking in Practice Competencies

Report on Systems Thinking in Practice competencies workshop 10 June 2017¹

Authors: Martin Reynolds, Rupesh Shah, and Jitse van Ameijde (part of eSTeEM team)²

Introduction

On 10 June 2017, fourteen stakeholders from across the UK came together in Camden, London to engage in a collaborative inquiry on the framing of Systems Thinking in Practice (STiP) competencies as part of ongoing work that seeks to better support professional and institutional recognition of STiP skill-sets and capabilities.³

Phase 1 of this current inquiry comprised a series of online conversations with six prominent systems thinking practitioners, conducted by Rupesh Shah (see listing in Acknowledgements). An interim report on phase 1 is available on request.⁴ Phase 2 sought to extend the inquiry with a selective invitation to engage with a one-day workshop in London (see Annex A for listing of participants). Phase 3 will seek to deepen and widen the conversations on framing STiP competencies and capabilities with a view towards developing and enacting a platform for managing systems thinking in practice (STiP) capabilities through ongoing development of competency frameworks associated with STiP.

During the workshop, stakeholders examined several existing and emerging competency frameworks in the systems thinking domain and explored issues of mutual interest and concern, whilst envisaging how to co-operate over the framing and enactment of competencies and capabilities in STiP.

Participants

Participants included a range of stakeholders, including members of various systems bodies involved in competency framework development, alumni and staff from the Open University Applied Systems Thinking in Practice group, and other practitioners with an interest in STiP competencies (Annex A).

¹ Venue: FutureLearn, 1-11 Hawley Crescent, Camden Town, London NW1 8NP.

² The workshop is part of a wider inquiry funded by eSTeEM – the Open University Centre for promoting STEM (science, technology, engineering, and maths) Pedagogy. The full eSTeEM team comprises Martin Reynolds – Principle Investigator (Senior Lecturer and Co-Lead on OU postgraduate systems thinking in practice (STiP) Qualifications), with Co-investigators, Rupesh Shah and Jitse van Ameijde (Associate Lecturers in postgraduate STiP Qualifications), with Ray Ison (Professor of Systems and STiP Qualifications team member) and Chris Blackmore (Senior Lecturer and Co-Lead on STiP Qualifications), along with Elaine Wedlock (Associate Lecturer in STiP Qualifications and member of first inquiry team). All are members of the Applied Systems Thinking in Practice (ASTiP) Group, School of Engineering and Innovation, The Open University, Walton Hall, Milton Keynes MK7 6AA. Core team email contacts: martin.reynolds@open.ac.uk; rupesh.shah@open.ac.uk; jitse.van.ameijde@open.ac.uk

³ The workshop builds on an earlier eSTeEM inquiry report on [Enhancing Systems Thinking in Practice at the Workplace](#) (available through the hyperlink) – an eighteen-month action research inquiry into the experiences of Open University postgraduate STiP students and alumni in applying systems thinking in practice at the workplace.

⁴ Contact either rupesh.shah@open.ac.uk or martin.reynolds@open.ac.uk

Participants brought a range of interests and enthusiasms to the workshop which for a large part centred around:

1. Learning from others involved in some capacity in the development of STiP competency frameworks
2. Supporting STiP practitioners in gaining recognition for systems practice skills
3. Sharing their own experiences around and views on STiP competencies

The core eSTeEM team will maintain contact with these and any others who wish to be involved with future conversations in order to ensure that the developmental work maintains bridges with as many stakeholders as possible.⁵

Format of the workshop

The workshop was introduced by Martin (Reynolds) in making some brief commentary on distinctions between competencies and capabilities. Drawing on a recent publication where Ray (Ison) makes a distinction between systemic sensibilities, systems thinking literacy, and systems thinking in practice capabilities, Martin speculated how useful it might be to consider differentiating between STiP competencies as essentially 'literacy skills' that might be taught and trained for, and STiP capabilities as qualities associated with *applying* competencies in changing and variable complex situations of practise, including workplace situations. Annex B provides the graphics used to illustrate the suggested working distinction between capacities, competencies, and capabilities. Some ensuing discussion explored the usefulness of such distinctions, and flushed out issues regarding the currency of language. Often, for example, the two terms 'competency' and 'capability' are used interchangeably. Alternatively, in some domains of management, 'competencies' are more associated with individuals and 'capabilities' associated with organisational attributes.

The ensuing workshop involved a mixture of small group work and plenary discussion. It consisted of two sessions: a morning session – which focused on engaging with recent work within the development of STiP competency frameworks, and an afternoon session – which focused on developing a shared platform for supporting engagement with STiP competencies.

The morning session involved four brief presentations from representatives of different organisations involved in the design of competency frameworks related to STiP:

- (a) Forum for the Future: Anna Birney
- (b) SCiO (Systems and Cybernetics in Organisations): Niki Jobson
- (c) INCOSE (International Council on Systems Engineering): Ivan MacTaggart
- (d) The Open University: Rupesh Shah and Jitse van Ameijde

Each of the designers shared their views in relation to the framing of competencies, the development of their competency framework and the envisaged enactment of their particular framework (see Annex C for brief summaries of each presentation). Then, workshop participants deliberated in small groups on the relative benefits and tensions associated with competency framing, drawing on individual experiences and the four frameworks presented.

⁵ Aside from the fourteen participants who attended the workshop (see Annex A), there were several other people and organisations who had registered an interest in taking forward ideas of enhancing recognition of systems thinking. If you are interested in contributing please contact r.a.shah@open.ac.uk to be added to our mailing list.

In the afternoon small groups explored design features of an idealised meta-system (that is, a system *for* enabling STiP competency as against a system/framework *of* STiP competency – see figure 1 below). The meta-system was defined initially in terms of ‘a system to support the ongoing engagement with STiP competencies’.⁶ Three groups focused on exploring design issues: one from a viable systems model (VSM) perspective; a second using a critical systems heuristics (CSH) perspective; and a third using a system dynamics/multiple cause diagramming (MCD) perspective.

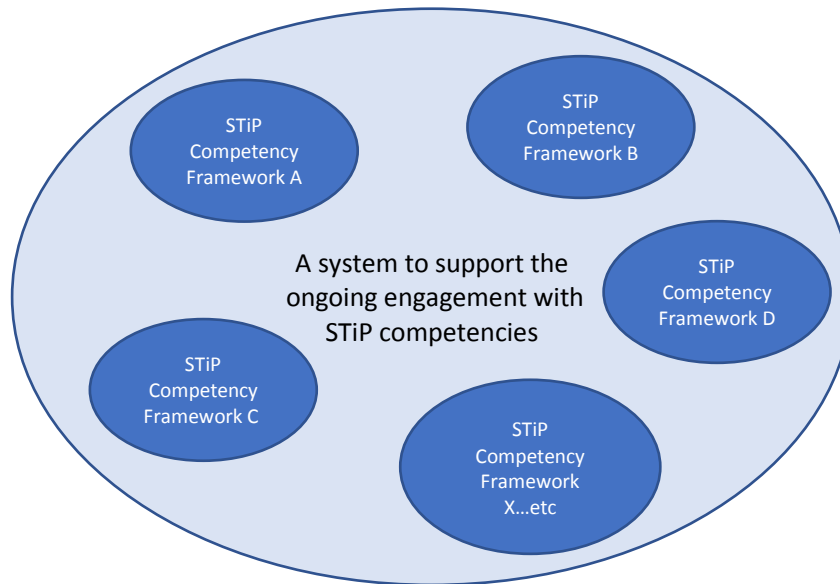


Figure 1 - Systems map of a system for enabling STiP competency

Perceived benefits of STiP competency frameworks

During the workshop, a range of benefits of STiP competency frameworks were explored and articulated. Perceived benefits included:

- Generating demand for STiP development
- Recognition of STiP as a valuable skillset
- Support for the development of STiP skills
- An enabling structure for the provision of learning and development in STiP
- Fostering organisational receptiveness to STiP by making skills more ‘visible’
- Recognising the importance of intervention and application skills; key element of practitioner capability
- A means to validate STiP practice
- A guard against proliferation of some misguided espoused systems practice which damages the reputation of STiP as a skillset

Since this project started, the eSTeEM team framing of the Open University’s role in supporting the engagement with STiP competency has shifted from working on the development of a specific competency framework for STiP practice towards the development of a platform to support

⁶ Proposals for phase 3 of this inquiry (see section on ‘Next Steps’) suggest a slight rewording in terms of ‘a system to support STiP capabilities through ongoing developments of, and engagement with, STiP competencies’

engagement with STiP competency. The workshop deliberations confirmed this widening potential role for the eSTEEem project.

Key tensions

During the presentations and activities a number of conceptual tensions came to the fore which seemed to articulate key dimensions underpinning the different framings of STiP competency (including the content, the process of development, and possible enactment of any framework). The following section represent a summary of five of these tensions. Each set of tensions might be regarded as an either/or dualism, or as a duality – invoking elements of both. Alternatively, each tension might be regarded as a continuum between two extreme poles, where the actual location of framing competency on the spectrum is determined by the peculiar circumstances.

(i) Systematic versus systemic framing

Traditionally, competency frameworks tend to be fairly systematic representations of collections of competencies grouped in some meaningful way. There was a significant amount of discussion around what makes a competency framework “systemic”. It was noted that even though the competencies articulated within a framework might be considered systemic, by treating competencies as relatively independent components of overall competence in systems thinking in practice, a practitioner could be enacting the individual competencies in a rather mechanistic, technocentric manner. As such, a competency framework for systemic competencies could easily promote non-systemic practice by treating competency in an overly systematic manner emphasising compliance, rather than a more systemic way for nurturing STiP capabilities.

(ii) Comprehensiveness versus usability

The competency frameworks presented by Forum for the Future, SCiO and INCOSE diverged in the level of detail expressed, ranging from a small number of competency areas each broken down into a few indicators, down to a comprehensive collection of systemic models, theories, principles and approaches. Some of the discussion focused on exploring the appropriate balance between ensuring appropriate coverage of the diverse systems field on the one hand and keeping the framework useable and meaningful on the other hand. Each framework has been developed to support specific and different purposes. For example, the framework developed by SCiO is detailed as it needs to be able to identify experts in the broadest ‘body of knowledge’ for its mentoring scheme; SCiO would not necessarily use this framework if they were running a certification scheme. A conceptual distinction may be helpful; between recognising (the growing multitude of...) ‘systems methods’ as apart from recognising (the underlying principles of...) ‘systems thinking’.

(iii) Plurality versus proficiency

A related tension between privileging breadth of multi-methods as against the depth and adaptive use of relatively few methods was explored during the conversations, and can be understood in the notion of plurality versus proficiency. On one side we can view systemic competence as an ability to draw on a plurality of different systems methods, models, ideas and concepts, whereas on the other hand we can argue that it is not the breadth of methods a practitioner draws on but the systemic proficiency with which they translate a given approach into practice. Depending on how we frame systemic competencies, it would be easy to value plurality over proficiency. Alternatively of course, it is easy to slip into using one tool unreflectively and unimaginatively for a range of tasks that are ill-suited for such use (i.e. using a hammer to crack a nut). Whereas it may be easy to put measures on ‘plurality’ of methods, it is perhaps less easy to establish measures of ‘proficiency’

(iv) Regulatory versus developmental

A fourth tension relates to the enactment of the different competency frameworks and the degree to which these are intended to act as a means of regulating practice versus supporting practitioner development and growth. On the regulation end, competency frameworks act as a means to assess and control practice to ensure it meets certain standards. Here competencies are associated with the language not only of standards, but of compliance, credentials, yardsticks, accountability etc. On the developmental end, competency frameworks act as a means to identify gaps in skills, knowledge and abilities, and opportunities to address these to support the developmental trajectory of practitioners. The language here is more associated with notions of coaching, nurturing, fostering, nourishing etc. Implications for the design of a competency framework somewhere on this spectrum appear to relate to the language used as well as the level of specificity at which the competencies are articulated. This relates not just to content of a framework but also the process of development in terms of who the 'owner' is, what their role is, and the 'scope' of practice (in terms of range of ways of practice, how far encoded and institutionalised such practices might be, and what built-in assumptions of 'customer' expectations might be, etc.).

(v) Foregrounding versus backgrounding systems practice

(Internal versus external orientation)

When it comes to the development of STiP competency, there appear to be two positions which relate to how STiP competency is perceived in relation to professional practice. One more internally oriented perspective privileges systems thinking itself as a professional practice in the foreground, whilst placing other mainstream professional practices more in the background. The other more externally-oriented perspective places existing mainstream professional practices in the foreground whilst placing the systemicity of practices in the background. In other words, does the competency framework construct/dictate what constitutes systems practice, or does it construct/dictate what makes a particular practice (such as change management, healthcare provision or environmental management) systemic?

Development of a platform for engagement with STiP competency

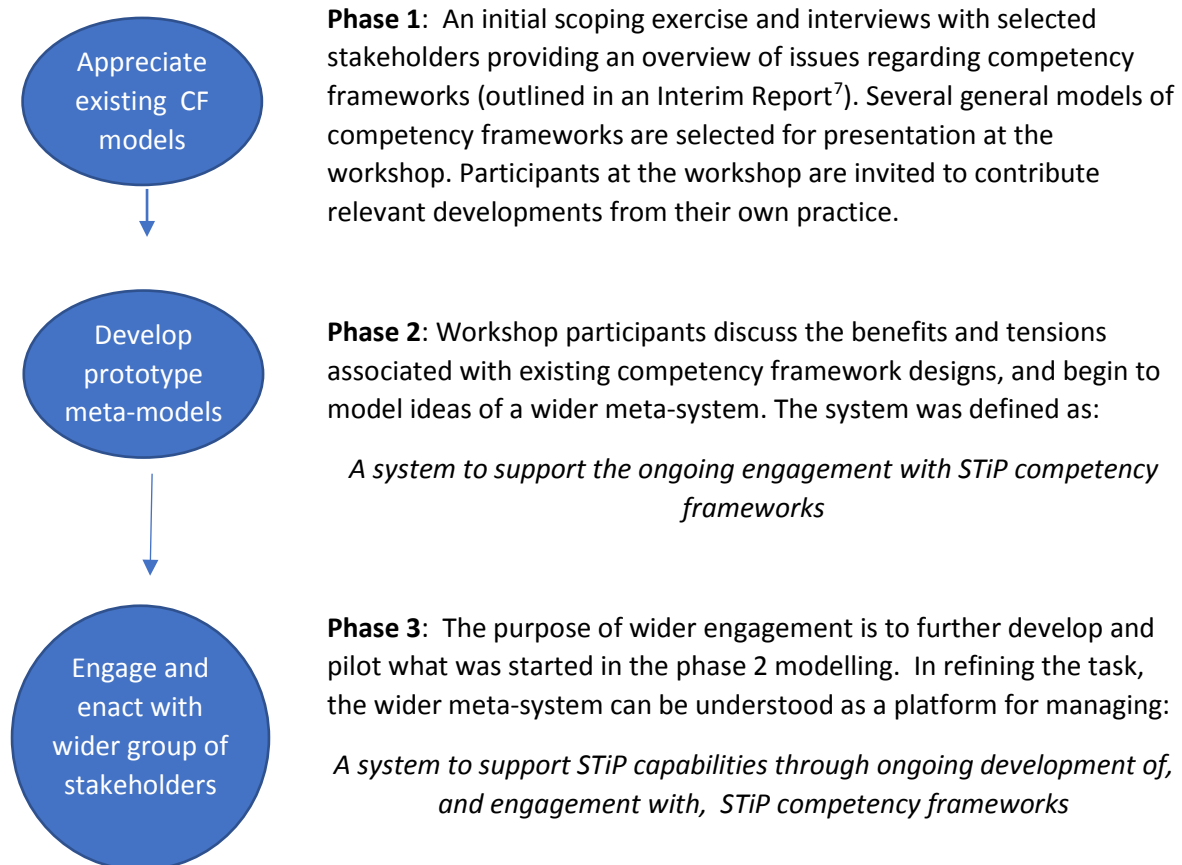
The afternoon session involved small group work in co-designing different framings for this wider platform for engagement with STiP competency using the Viable System Model, Critical Systems Heuristics, and System Dynamics/ multiple cause diagramming. Some insights derived from this work include:

1. There is significant interest and scope for the various stakeholders involved in the development of STiP competency frameworks to learn from each other in a mutually supportive and constructive way
2. The richness and diversity of the Systems field creates scope for various competency framework initiatives to be able to co-exist, yet there is a danger of fragmentation and a desire to support the development of a unified core from which the different emerging competency frameworks can be seen as branches
3. Two distinct approaches for developing STiP competency can be recognised with one involving the development of dedicated STiP competency frameworks and the other involving the integration of STiP competencies or features in existing professional competency frameworks or standards. The two approaches need not be incompatible but involve different strategies.

4. There is a clear desire to move away from a narrative of difference to a narrative of commonality within the Systems Field and to legitimise a diversity of practices rooted in a common appreciation of the systems idea
5. A key constraint for supporting engagement with STiP competency is availability of resources – including financial capital as well as human, social and political capital
6. There is a need to explore the national and international ecologies within which the emerging platform for engagement with STiP competency framing needs to be both steered as well as needing to be an active agent of steering.
7. If the OU is to focus its energy on the development of a platform to support engagement with STiP competency then there is a need to understand the environment of this platform and how the platform ought to relate to this environment

Next steps

The workshop represents an ongoing part of phase 1 and phase 2 of the wider research inquiry to support development of STiP competencies and capabilities.



An increasing demand for some form of visible benchmarking associated with systems thinking in practice is evident amongst providers ('STiP practitioners') as well as users (employers and commissioners and mainstream professional agencies associated with health, education, business, international development etc). There is as yet no one single professional body associated with

⁷ For a copy, contact either rupesh.shah@open.ac.uk or martin.reynolds@open.ac.uk

exclusive and widely legitimised formal accreditation of systems thinking, though there are agencies that have 'systems thinking' as part of their accreditation process (e.g. INCOSE-UK), and there are agencies that provide less-formalised accreditation. Significant work has gone into the development of different STiP related competency frameworks by different bodies promoting systems practice. Forum for the Future, SCiO and INCOSE are just three examples (at the workshop) amongst very many initiatives that have emerged in recent years and come to the attention of this action research inquiry. The plurality of competency frameworks can be regarded as mirroring the plurality of systems methods associated with systems thinking in practice.

Some questions have emerged from the phase 1 and phase 2 conversations associated with this inquiry:

1. Is there a need for a single authoritative professional body associated with exclusively with systems thinking in practice?⁸ How might ISSS (International Society for Systems Science) or IFSR (International Federation of Systems Research) be suitable for such a role?
2. Is there a need for a consolidated competency framework associated with systems thinking in practice or is it more appropriate to retain/ encourage the development of a range of STiP competency frameworks?
3. Depending on the response to questions 1 and 2, what might be the role of different stakeholder groups – employers, existing professional bodies, trainers and educators, membership organisations, charitable agencies, etc.?

The eSTEEem action inquiry team are keen to build on this wave of interest in STiP competency framing in collaboration with colleagues from different stakeholder groups. The team will assess and review the resource implications in developing a platform for managing a system to support STiP capabilities through existing development of, and engagement with, a plurality of competency frameworks associated with STiP.

Through orchestrated conversations, we will continue developing a platform for managing a system to support systems thinking *in* professional practice and/or systems thinking in practice *as* professional practice. The work here will provide a helpful complement to the development of a postgraduate (Level 7) Systems Thinking Practitioner Apprenticeship scheme being developed and led by Ray Ison and the ASTiP team at OU in collaboration with a consortium of employers from different sectors, with financial and human resource support secured from The Open University. The employer-led consortium will be responsible for setting up Standards for the proposed 'trailblazer' Systems Thinking Practitioner apprenticeship.⁹ Figure 2 illustrates the dimensions of Phase 3 modelling.

⁸ Bodies like INCOSE for systems Engineering (represented by Ivan MacTaggart) and CIEEM for ecological and environmental management (represented by Andy Lane)

⁹ The term 'trailblazer' apprenticeship is used by the Higher Education Funding Council in a recent call for proposals to Higher Education Institutions for promoting Apprenticeships.

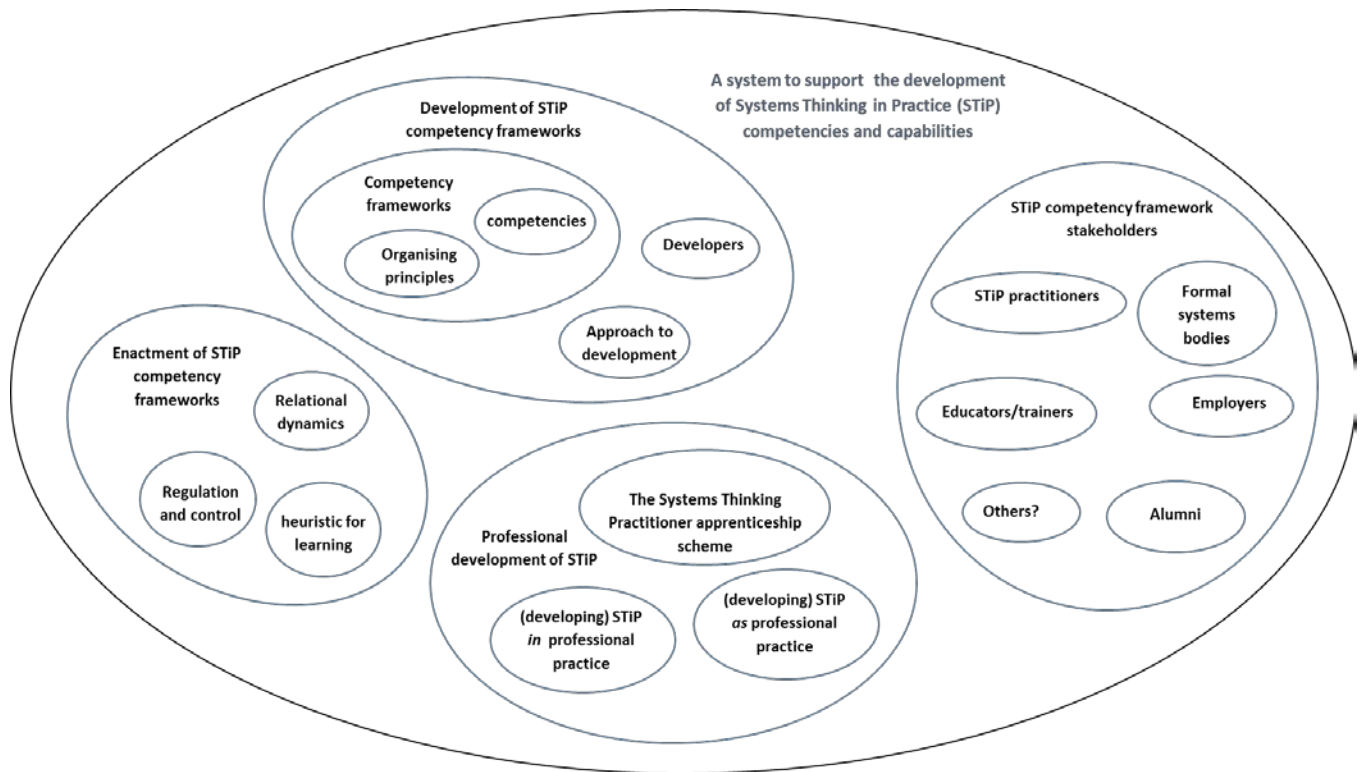


Figure 2 Systems map illustrating Phase 3 of eSTeEM action research inquiry: a platform for managing the development of Systems Thinking in Practice (STiP) competencies and capabilities¹⁰

Phase 3 will involve further reporting and dissemination on the workshop to groups and meetings including the 3rd STiP Alumni workshop in Dublin (1st July 2017)¹¹, and a special panel meeting being convened at the ISSS conference in Vienna (11th -13th July 2017)¹².

Continuing into the second half of 2017, correspondence will be held with a wider community to include alumni from systems thinking education and training programmes, educators, researchers, practitioners, systems thinking peak bodies (including ISSS and IFSR for example) and employers. This will involve collation of feedback to the workshop report, alongside possible facilitated online discussion webinars. The conversations will use the outputs of the phase 2 workshop to nurture conditions through which multiple frameworks for systems thinking in practice can be developed and accessed.

As part of the eSTeEM inquiry, a repository of existing competency initiatives associated with STiP is being developed which will be available for updating and for reference through an online wiki or blog. Notice of this will be circulated alongside further correspondence regarding initiatives to take forward the development and enactment of the platform (Fig.2).

The aim of phase 3 is to consolidate some mutual understandings of what is involved with a STiP competency framework and what role different agencies – including consultants, professional

¹⁰ An activity model based on this platform is being developed by the eSTeEM inquiry team in order to guide ongoing inquiry activities

¹¹ STiP Alumni are a self-organised LinkedIn group of graduates who have undertaken the Open University course in systems thinking in practice. Since 2014, the group have organised an annual event. A verbal report was presented to the Dublin one-day event in July 2017 by Martin Reynolds

¹² Involving Ray Ison and Chris Blackmore

bodies, membership groups, employers, and higher education providers and trainers – may have in further cultivating STiP competencies and capabilities in an increasingly turbulent world.

Acknowledgements

1. This research is being funded by eSTeEM - the Open University Centre for promoting STEM (science, technology, engineering, and maths) Pedagogy. eSTeEM also funded the action research inquiry - *Enhancing Systems Thinking in Practice at the Workplace* – from which this study originates.
2. The eSTeEM team are indebted to the active involvement of all participants of the workshop who kindly provided their invaluable time (Annex A).
3. The research team is also indebted to the following co-respondents as part of Phase 1 who agreed to be interviewed for this study and/or provided feedback:
 - Gene Bellinger, systems-thinking.org
 - Richard Bawden, Independent consultant, Australia
 - Patrick Hoverstadt, SCiO
 - Eileen Munro, London School of Economics
 - Samuel Njenga, Systems Thinking Africa
 - Ian Roderick, Schumacher Institute/UKSS
 - John Seddon, Vanguard

Annex A: Workshop participants

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¹⁶ Chartered Institute of Ecological and Environmental Management

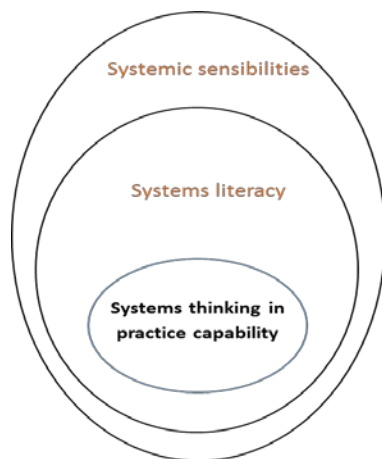
¹⁷ International Council on Systems Engineering

¹⁸ European Foundation for the Improvement of Living and Working Conditions

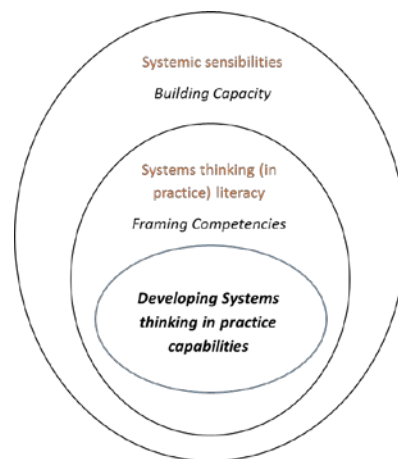
Annex B: Systems thinking in practice: competencies and capabilities

Introductory slides (Fig.1) illustrating possible differentiation between capacities, competencies and capabilities. Adapted from Ison, R. and Shelley, M., (2016). Governing in the Anthropocene: Contributions from Systems Thinking in Practice? *Systems Research and Behavioural Science*, 33(5), pp.589-594:

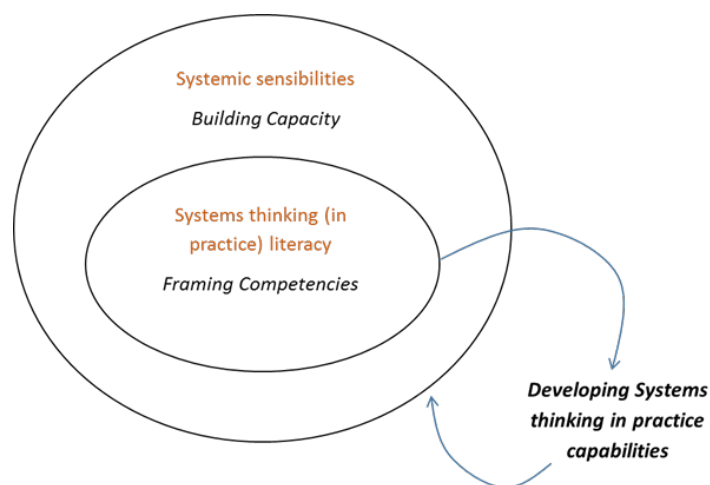
“What is missing ... are the contexts for a systemic sensibility to flourish, to be recovered and/or fostered. Investment in systems literacy [competency] and then systems thinking in practice capability is missing in education as well as organizational life.” (Ison and Shelley, 2016 p.589)



(a) Sensibilities, Literacy and Capability as nested systems (Ison and Shelley, 2016 p.589)



(b) Capacity, Competencies, and Capabilities as nested systems © Martin Reynolds, 2017



(c) Enabling Development of Capabilities in the Workplace © Martin Reynolds, 2017

Figure A.1 Ways of viewing systems thinking in practice (STiP) competencies in relation to capabilities

Annex C: Four endeavours towards framing STiP competency

The initial four presentations at the workshop offered contrasting experiences in developing competencies for systems thinking in practice.

1. Anna Birney and her colleague Laura Winn from *Forum for the Future* use the terms competency and capability interchangeably. Forum for the Future is a charity that has been working on sustainability issues with other organisations for 20 years. It is currently developing its work to lead change through the School for System Change. Anna and Laura have been working on developing a set of five core capabilities (systemic diagnosis, strategy design, innovation and impact, collaboration and engagement, and leadership and learning) around the Systems Change programme of training being implemented. Each area of capability has a multitude of skillsets associated with them. Whilst the range of skills are important for making effective change/ transformation, 'system changers' may require collaboration in order to compensate for skills not immediately at hand or less-well developed. The key item of rigour involved in the design framing is not so much 'reliability' in a scientific sense, but rather drawing on criteria of 'resonance' and 'relevance' as expressed through experiences of working with participants on the Systems Change programme.
2. Niki Jobson has been recently spearheading, with Patrick Hoverstadt amongst others, a *SCiO* initiative in developing a competency framework for systems thinking. SCiO is a long-standing membership organisation rooted in traditions of cybernetics and the Viable Systems Model of Stafford Beer, though not exclusive to other systems thinking traditions. SCiO provides professional support for systems practitioners. The core drivers behind the competency framing initiative is twofold. Firstly, a framework enables systems practitioners and their practice to become more visible amongst different mainstream professions associated with the workplace, and hence helps SCiO in its role as a 'dating agency' for those in demand of systems thinking expertise. Secondly, a framework can support a mentoring scheme introduced by SCiO for continual professional development (CPD) for its members and other interested professionals. The framing has matured through a number of iterations. The framework has four elements – body of knowledge, enabling application and intervention skills, skill level/ experience in practice, and intervention context. In contrast to Forum for the Future, SCiO builds upon scientific principles and theorems of cybernetic feedback, focusing more on co-guarantors of reliability (in contrast to co-guarantors of resonance, as perhaps focussed on more by Forum for the Future).
3. Ivan MacTaggart is current President of *INCOSE-UK* – a well-established professional body for systems engineers. Unlike both Forum for the Future and SCiO, INCOSE-UK have developed a relatively concise expert-driven framework, though specifically for the profession of systems engineering. It is used formally as a means of certifying systems engineers in the UK, though can be tailored to suit the monitoring and evaluation indicators for other managerial professions. Unlike INCOSE-USA, the certification of competent systems engineering is not reliant just on the years of practice (e.g. in USA, any systems engineer with 25 years of practice can become a certified engineer). The competencies are grouped into three themes – systems thinking, holistic lifecycle view, and systems engineering management. Systems thinking is therefore a subset of systems engineering skills. Competency is measured according to requisite interdisciplinary skills, including mechanics, electronics, software, amongst other human-centred skills. Three levels of competence are identified – supervised practitioner, practitioner, and expert (similar to SCiO levels of apprentice, senior apprentice, practitioner, master practitioner, and master). The

INCOSE-UK framework is used explicitly as a measurement tool but one that can be customised – through a licensing fee - for different professional measures.

4. Rupesh Shah and Jitse van Ameijde are Associate Lecturers (tutors) for the postgraduate STiP core modules at the OU as well as core members of the eSTeEM inquiry team. The Open University eSTeEM project set out to contribute its own competency framework. In many ways the OU has its own set of STiP competencies as registered in the core set of STiP curriculum learning outcomes. These are associated with conventional learning outcome groups of Knowledge and understanding (core concepts), cognitive skills (reflective practice etc.), key skills (Communicate effectively etc.), and practical/professional skills (design, manage, evaluate etc.). In addition there are underlying heuristics associated with each of the two core STiP modules. The two heuristics are (i) understanding inter-relationships, engaging with multiple perspectives, and reflecting on boundary judgements (associated with module TU811 – Strategic Thinking) and (ii) Being, Contextualising, Engaging, and Managing (associated with module TU812 – Managing Systemic Change).