

**Learning for Change in Public, Educational and
other Science Organisations: Embedding greater
public engagement**

***Critical Challenges and Lessons Emerging from Literature
Review***

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Executive Summary

Introduction and Methodology

Supporting scientific organisations to engage the public in their work requires a shift in the larger scientific culture. This paper explores that challenge.

We conducted a broad, not deep, review of the literature including: business and management organizational change and development, NGO and international development, organizational learning, higher education and public engagement, citizenship and science.

Science and Public Engagement

1. Clarity of goals for public engagement in science

Public engagement is a means to achieve a goal; it is not a goal in and of itself. Science can also be a means to a goal. Greater public engagement in science necessitates a shared understanding and articulation of the goals for each.

There are gradations of public engagement, including public engagement in science. We use Benneworth's (2009) gradations of 'dissemination, conversation, co-inquiry and co-governance'.

We suggest that for Science for All's goals to be realized, there must be an active path towards co-inquiry and co-governance. Based on the evidence, we suggest this is necessary not only to enable greater trust of science and scientists by the public, but also to enable both better science and enhanced citizenship by all involved.

2. The culture of science remains removed from 'the public,' limiting the potential for public engagement

Both scientists and the public only ever have partial knowledge. While the benefits of these two knowledge-systems working together are well documented, scientific culture remains largely aloof and distant from the public. Scholars who have worked on these issues in both the United Kingdom and in the developing world suggested that changing the culture of science to include the public in their process of creating knowledge would be close to revolutionary, cutting close to the heart of modernization.

3. Higher Education is embedded in, influenced by and shapes the larger scientific community

Future scientists receive training in HEIs where they acquire not only the tools of their trade but also an acculturation in the culture of science. It is also where a substantial portion of the 'public' receives its training of how to engage with scientific communities and with other powerful epistemic communities.¹

Higher education, in losing its purpose of educating strong citizens, has contributed to the production of both: a) citizens who lack the capacity to effectively engage with science; and b) scientists who lack the capacity to engage effectively the public.

Concern to re-legitimise science in the eyes of the public prompts reconsideration of the goals of higher education. Much current reconsideration of HEIs stems from creating stronger citizens and, currently, securing financial stability. This is, thus, a different perspective which could enhance current conversation within HEI about creating stronger public engagement.

Securing public engagement in science will require changes in role perceptions and competencies of all actors in the system—HEIs, the science community, citizens and government.

¹ The differential ease of access by diverse communities (based on class, race, ethnicity, religion etc.) to HEIs effects both the shape of the scientific community and any attempt for them to engage with the public. Space does not permit a fuller examination of this topic.

Organisational Learning for Change

1. Organisational culture and organizational development

Within an organization culture is expressed in the nature of leadership, authority, processes, roles and interactions, motivations (including reward and evaluation), and the norms—values—that underlie them.

Changing culture necessitates working with and shifting an organisation's values. Within the literature of developmental psychology, it is suggested that values develop and that stages of development can be identified. Different organisations at different stages of values development are going to be able to work with different gradations of public engagement. Ability to engage in 'dissemination, or conversation, co-inquiry or co-governance' will depend on the level of values development of the organization. Hall identifies the following stages of values development as expressed in the style of leadership: authoritarian, paternalist, manager, facilitator, collaborator, servant, visionary. For an 'authoritarian' or even a 'managerial' organisation to engage in 'co-inquiry' would imply a cultural shift to a collaborative culture. There are limits to what is readily feasible. The cultural shifts required might take time.

From this perspective, we find:

- Knowledge of an organisation's culture is essential to a realistic assessment of the feasible extent of its immediate willingness to engage with the public.
- Attempts to move to higher levels of public engagement might require programmes deliberately aimed at supporting values shifts and cultural change.
- Realization of higher levels of public engagement by organisations might best be approached incrementally starting with what is immediately feasible, acknowledging organisational culture and leadership style, and offering benefits valued by the organization e.g. public recognition, tenure, and other motivations.
- As successful examples emerge, encapsulate these as models and arrange for exchanges of experience.
- The design of forums and other devices for securing public input needs to be suited to engagement with specific organisational cultures. Recognize that this is a learning process for the public as well as for the organization. Forced engagement serves neither.
- Reflection and awareness—specifically of the values and behaviours required to embrace and give effect to public engagement—is key to any development.

2. Organisational Learning

Systems thinking has enabled a different perspective on how organisations learn. It has influenced knowledge management and organisational learning, both of which are valuable for public engagement.

Some combination of action (practical and experimental engagement with the material), reflection (often with others) and practice are essential for learning. Informal networks, mentoring, informal spaces to share and teach, opportunities for experimentation, are all helpful for learning.

Key Lessons: Challenges in Practice

1. Recognising Barriers to Organisational Learning and Change

Culture shift shifts power within an organisation, and, in this case, within the system as a whole. Indeed, a major objective here is the empowerment of citizens. But power shifts can meet resistance, and power holders will need to feel reason to relinquish power. Resistance which can stem from threats to territory/capital (social and financial) and differences in ideologies/goals is normal and needs to be respected.

2. Understandings

Time

Organisational change should be measured in years, not months or weeks.

Focus

Clarity and ownership of goals is essential.

Legitimate interests

The legitimate interests of all actors should be explicit and agreed.

Leadership

Leadership is critical for organizational change. But don't depend upon a charismatic leader. Leadership includes top management and middle management. Leadership differs depending on organizational style, culture and values.

Skills

Engaging with the public requires certain skills. Different gradations of public engagement require different identifiable skills. These can be learned with practice. Organisations need to invest in, monitor and reward these skills.

Design

Elements of a good design process for enabling public engagement (or any change) need to be relevant to the organisation but might well include:

- Creating a steering committee within the organization with a clearly defined mandate to co-ordinate and facilitate the change process.
- Securing ownership of clearly defined processes, roles and responsibilities.
- Building competencies to fulfill roles through on-the-job training.
- Allocating resources (material, financial, equipment, travel, training, personnel support/ mentoring, etc) for both capacity building and ongoing activities not otherwise funded.
- Creating, highlighting, and encouraging participation in pilot projects.
- Rewarding performance of new functions
- Amending Measurement and Evaluation/assessment to include public engagement. "To value something fully, one must evaluate it fully" (Ellison & Eatman, 2008). M&E should include individual assessment and organisational assessment.

Enabling attitudes include: respect (including respecting resistance), humility, patience, persistence, trust and reflectivity.

Table of Contents

1. Introduction and Methodology	6
1.1 Introduction	
1.2 Methodology	
2. Science and Public Engagement	9
2.1 Clarity of goals for public engagement in science	
2.2 The culture of science remains removed from ‘the public,’ limiting the potential for public Engagement	
2.3 Higher Education is embedded in, influenced by and shapes the larger scientific community	
3. Organisational Learning for Change	13
3.1 Organisational Learning	
3.2 Organisations	
3.3 Organisational cultures and organisational development	
3.4 Organisational Learning	
3.5 Ways forward in organisational learning for cultural change	
4. Challenges in Practice	22
4.1 Recognising Barriers to Organisational Learning and Change	
5. Enabling Aspects and Attitudes for Learning	24
5.1 Enabling Aspects	
5.2 Enabling Attitudes	
6. Conclusion	28
7. Appendix	30
8. Bibliography	32

1. Introduction and Methodology

1.1 Introduction

'In times of change, learners will inherit the earth, while the learned will find themselves well-equipped to deal with a world that no longer exists.'

- Social philosopher and writer Eric Hoffer (cf Aragon, 2009:30)

Amid continued public concerns over the validity, purpose and role of science in society around the world, the Science for All (SFA) Working Group has been tasked by the British government with:

Creating a culture where science is more relevant to everyday life and where public engagement activity by science, business, academia and policy is valued, recognised and rewarded (Featherstone et al, 2009:1).

To achieve this goal requires a shift in the current scientific culture. Scientific culture, described as an 'epistemic community' by the students of the Sociology of Science and Technology, has long distinguished itself from 'the public' by, among other things, its a) techniques which were assumed to bring economic growth, prosperity and general well being and b) by its 'objectivity' which both enabled and required it to be emotionally and intellectually removed from its socio-cultural context. This enabled it to observe the world 'without bias'. Even though the boundaries between science and society were never absolute, the 'scientific' epistemology and even its ontology² – its way of being – have historically set it apart from the rest of society.

Scientists are increasingly questioning the greater cultures of science within which they have to posit themselves, and the emphasis on objectivity and detachment (Bourdieu cf Golsorkhi, et al, 2009). These historically entrenched boundaries are being questioned by those who carry out scientific functions, from Higher Education Institutions (HEIs) to private research institutions, engineering firms, social science research councils, government researchers, and the vast array of other institutions engaged in 'science'.³

To shift the larger scientific culture requires shifting institutional culture, enabling scientific organisations to learn how to enable greater public engagement⁴. This paper begins exploring that challenge: how to shift the institutional and organisational cultures of all scientific organisations to enable greater public engagement.

We ask: 'How can organisations (particularly science organisations) learn towards the particular goal of embedding greater public engagement?' This question entails looking at science and public engagement, the nature of organisations, organisational development and organizational learning in multiple sectors. We fully admit this question is too large for the time and space permitted here: this paper is only the beginnings of what will hopefully be an ongoing learning process for British society.

Changing organisations is necessary to change the larger society, but so too is changing the larger society essential to changing organisations. A significant challenge lies in creating cultural changes in the wider social systems of which 'science' organisations are a part. Disparities between greater societal norms and the changes that would take place within the science – public subsystem will slow down the process of cultural shifts. Ultimately, it is insufficient to look at organisational change in different sectors – business, higher education and NGO sectors - in isolation. A holistic cultural shift in all sectors towards public engagement is necessary – both to change the culture of science and to

² A fascinating commentary on the relationship between ontology and epistemology in the interactions between science and citizens can be found in Leach, Scoones & Wynne (2005).

³ We follow the Science For All broad definition of science for this paper.

⁴ Public/citizen(civic)/community engagement will be used interchangeably; recognising that they are parts of public engagement as per the NCCPE framework (<http://www.publicengagement.ac.uk/what-public-engagement/community-engagement>)

enable the public to learn to better engage with science. This tension between changing the parts and changing the whole arise throughout this paper.

Outline of Paper

Chapter 2 presents the context of embedding public engagement in science. We suggest that embedding public engagement with science as including at least three challenges: finding clarity of goals, shifting cultures of science and re-assessing the critical role that Higher Educational Institutions (HEIs) play as the training ground for scientists.

After grounding the discussion in the dynamics between science and public engagement, we move to a more focused analysis of organisations, organisational culture, development and learning in Chapter 4. Chapter 5 gives an overview of common barriers to change.

Our aim here is to not only present the literature but to draw lessons for public engagement; thus, throughout the paper there are recommendations. Chapter 6 focuses on key lessons that have emerged from the literature by suggesting enabling i) aspects and ii) attitudes in learning for cultural change.

1.2 Methodology

This study consisted primarily of a desk review of relevant literature. We also included material from informal conversations and interviews with some of the experts (Gaventa, Harrison, Pettit, Joy and Ross) in the field of organisational learning and development to get their assessment of this challenge. They were chosen based on availability, personal connections and their different perspectives.

Both because of the nature of the task and because we adhere to Einstein's observation that "*You can't get out of a problem with the same kind of thinking that got you into the problem in the first place*" (Einstein quoted in Sterling, 2006), we drew upon a wide range of literature.

We tended to favour some of the newer and cutting edge theories, such as Values Development and Knowledge Management over some of the well-trodden paths of human relations and inducing behavioural changes. Thus, our review includes academic literature, grey literature and business literature encompassing: organisational development literature from the private sector, sociology of science and technology, public engagement in science, higher education's attempt to increase public engagement, the public sector, and has also drawn significantly from the very new and still evolving literature on organisational learning in international NGOs. The latter have been under increased pressure in the current social and political environments to 'embed the ethos of participation within organisational cultures' (Britton, 2003, Roper, and Pettit, 2005, Padaki, 2002, Hailey and James, 2005). This is not a complete synthesis of these ideas – it aims to highlight trends, lessons and challenges that might lay the ground for future policy and work.

While each sector has something to offer the other⁵, most organisational literature we read and our informants agreed that at our level of meta-analysis, useful comparisons could be made just as well between sectors as within them. Thus, throughout the paper, we draw from different sectors and do not focus the paper on a comparative analysis between sectors, which reflects the general shape of the literature.

We found several gaps that suggest the need for further research. Not least, a more substantial study is needed to closely look at the organisational and cultural changes made by specific actors in each sector to tease out specific lessons for institutional shifts for the specific purpose of learning for public engagement. This might include, for example, corporate social responsibility, marketing, and other forms of public engagement as outlined by other papers in this study (Featherstone et al 2009) as well as institutional changes in the public sector brought by, say, decentralization and subsequent lessons.

⁵ For example, businesses and HEIs could both learn from the OL literature in the international development field for how to better engage with communities, or the public in general.

To walk our talk, we briefly share some our personal experiences. As social science researchers, we have tried to inculcate the values of reflexivity in the process of writing this paper, in order to be able to understand our own frames for understanding the issue. We questioned each other and subsequently our own assumptions about learning, cultural change and science. We did not always agree. For example, Wolcott has been influenced by her work with the Values Development paradigm, and emphasizes a developmental perspective as well as seeking coherent solutions. Sengupta's experience has given her a more post-modern perspective with a stronger emphasis towards highlighting diverse approaches. While compatible, these perspectives are not always easily synthesized; some tensions between them remain in the paper. We find this amusingly appropriate to the task at hand.

2. Science and public engagement

In this chapter, we review the goals for public engagement in science, grounding the discussion in the work being done by the Science for All Working Group.

2.1. Clarify the goals for public engagement in science.

Public engagement is a means to achieve a goal; it is not a goal in and of itself. Science can also be a means to a goal. Greater public engagement in science necessitates a shared understanding and articulation of the goals for each.

Science for All has already articulated a vision of science, and with it, for public engagement in science:

- *Those involved in the sciences listen to and are informed by knowledge and views from the public, leading to mutual learning and respect between scientists, the wider society and policy makers.*
- *The science communities are accessible and visible, and there is informed and open communication and debate about the findings, practices, process, relevance, directions and implications of science.*
- *All sections of society value science and its methods as creative and empowering ways to ask questions, offer solutions and contribute to our understanding and improvement of the world in which we live. (Featherstone et al, 2009: 2)*

These three goals are inter-related. The third is fundamental: it is a search for a renewal of the 'social contract' between science and the public, which, as Benneworth (2009) in his working paper prepared for SFA, suggested, is in need of re-vitalisation, as the public has lost its trust in science in recent years. The first goal enables the third goal to be realized. For the first goal to be realized, a particular type of public engagement is necessary.

Before fully addressing the types of public engagement to fulfil this goal, and thus clarify what types of organisational shifts are necessary, we must briefly look at the gradations of public engagement.

The gradations of public engagement

The gradations of public engagement in policy have been documented since at least the late 1960s, when Sherry R. Arnstein, an American scholar, first developed the now well-known 'Ladder of Citizen Participation' (Arnstein, 1969). Arnstein's ladder derived from her concern that attempts by governments to engage 'the public' were merely forms of rubber-stamping pre-conceived decisions, leading to greater cynicism and mistrust on the part of the public.

A sketch of Arnstein's ladder is given below.

(Citizen Power)

1. Citizen Control
2. Delegated Power
3. Partnership

(Tokenism)

4. Placation
5. Consultation
6. Informing

(Non-participation)

7. Therapy
8. Manipulation

The different gradations of public participation have significant implications for both the public and the 'expert community' in which they participate. These gradations have since been critiqued and added to

by academics and practitioners alike in the past thirty years; a recent summary can be found in Gauvin, F & Abelson's (2006) "*Primer on Public Involvement.*"

Benneworth's (2009) Working Paper suggests the following gradations of public engagement:

4. Co-governance
3. Co-inquiry
2. Conversation
1. Dissemination

His four gradations build on one another, assuming a higher level of interaction with the public. Each of these gradations requires different skills and different values and is appropriate in different arenas⁶. We use his categories when discussing public engagement for the remainder of this paper.

Benefits of Co-Inquiry and Co-governance: Better Science and Better Citizens

While there are benefits and drawbacks from each type of public engagement from 'dissemination' to 'co-governance,' we argue that moving towards Co-inquiry and Co-governance is necessary for the goals of Science for All (above) to be realized. Further, we would like to briefly emphasise the potential mutual benefits to *both* science (and scientists) and citizens at these 'higher levels' of engagement. We can envision both 'citizen-experts' and 'expert-citizens', recognising that scientists find their dimensions as citizens even as citizens can find a usefulness in their own realm of expertise⁷ (Leach, Scoones & Wynne, 2005).

There are many examples of how public engagement in science has led to distinct benefits to science and enhance citizenship from around the world. Some of them are illustrated in Table 1.

Table 1: Examples of public engagement that enhance the science-public

Research Field	Public input	Impact/Benefit
Plant breeding ⁸	Guatamala: farmers	Plants adaptive to context/need. Better for farmers. Scientists changed their methodology and assumptions.
Food/fertilizer ⁹	Zimbabwe: citizen juries	Shifted research goals and priorities; Members of Parliament shifted their decisions
Animal gene technology/food irradiation ¹⁰	Denmark: Danish Consensus Conference	Shifted national policies
HIV-AIDS ¹¹	United States: patients and health activists	Shifted bio-medical research; created major social movement

⁶ On a more microscopic level, once the particular goal of public engagement in science is defined, the 'public' needs to be disaggregated for the task at hand (Ross, 2009; Baker et al, 2006). The question then is '*Who is the public?*' Or as part of the broader question, '*Whose knowledge counts?*' Rarely does everyone's knowledge count – or should it. Discerning those questions entails a case-by-case analysis, and is beyond the scope of this paper.

⁷ Discussed further below

⁸ Forester and Cinderby, 2005 in Fortman, 2009.

⁹ Risuke, 2005

¹⁰ Fischer, 2000

¹¹ Epstein, 1996

Thus, citizen engagement in co-inquiry and co-governance can make for better science and, importantly, 'scientific engagement makes citizens' (Leach, Scoones & Wynne, 2005). For those interested in public engagement and citizenship, this is hardly a surprise.

Citizenship comes, in part, from active engagement in the decisions that affect people's lives – voting being the most basic example. Science – from health to agriculture to social science - is one of the critical areas where policy decisions and innovations are made and created that determine the course of people's lives.

This twin goal – of enhancing science's ability to solve society's problems and to enable citizens to participate in the decisions that affect their lives – is obtainable, but doing so requires a significant shift in both the cultures of scientific institutions, and of common perceptions and processes of public engagement.

2.2 The culture of science remains removed from 'the public,' limiting the potential for public engagement.

Whose knowledge counts?

Scientists only ever have partial knowledge. The 'public', also, only ever has partial knowledge. For science to enhance the public good, the two knowledge bases need to support one another. Until recently however, the modern world witnessed long standing and unquestioned power of scientific communities that allowed them to exert influence by offering specific truths about this world to the public, thus safely establishing themselves as the 'knowers' (Knorr, C. 1999 cited in Moisaner and Stenfors, 2009:231).

The epistemic cultures of the scientific community remains based on 'scientific detachment over practical engagement, the general over the contextual, and the quantitative over the qualitative' (McKiernan and Carter, 2004: 62 cited in *ibid*:228). Traditional scientific knowledge thus counts more than non-traditional (i.e. public) scientific knowledge. This makes public engagement difficult.

Public Engagement: A Challenge to Modernization

In discussing the relationship between science and citizenship, Leach, Scoones & Wynne (2005), suggest that for dominant expertise to accept its own 'cultural boundaries, frames, blinders' and limitations' would entail a significant challenge to modern development. Clearly this is a significant and challenging task.

How to do it? One common theme emerges from the science-and-citizenship literature is the importance of reflection and reflexivity. While other aspects, including mutual ownership and sustained engagement, shall be mentioned below, there is little doubt of the importance of scientists gaining greater reflexivity of their own cultural boundaries and thus an 'epistemological awareness'.

It has been found helpful for scientists to recognize that their own knowledge is incomplete and come to learn, usually through experience, the benefit of public engagement (Leach, Scoones & Wynne, 2005; Jasanoff, 2009; Fortmann, 2009; Stirling, et al, 2007; Bourdieu, 2000).

Organisational Development: insufficient but still important for changing culture

Individuals within organisations and organisations within a larger system will repeatedly run up against the seemingly insurmountable wall of scientific culture. While we suggest ways for organisations to learn and to develop, we recognize that our suggestions are of limited use given the up-stream battle that each organization – and indeed each sector - faces. As a result, networking and building the 'demand pull' from other organizations, other sectors, and the public itself will help create the conditions for organisational (and wider cultural) change. Both the challenge of changing organisations and the value of networking for support and learning have already been found within higher education.

2.3 Higher Education is embedded in, influenced by and shapes the larger scientific community.

Within the complex system of 'science culture', Higher Education plays a critical role. It is where future scientists receive training not only in the tools of their trade but where they become acculturated. And it is where a substantial portion of the 'public' receives *their* training of how to engage with scientific communities and with other powerful epistemic communities of power.¹²

The need and attempts to re-legitimise science in the eyes of the public occur simultaneously (but largely separate from) attempts to reconsider the goal of higher education. It is ironic that our current predicament is a chicken and egg scenario: Higher education, in losing its purpose of educating strong citizens, has contributed to the production of a) citizens who lack the capacity to effectively engage with science (and other expert communities whose decisions effect their lives) and b) scientists who lack the capacity to engage effectively (or even value engaging with) the public.

Trying to change the sea: what are the appropriate goals of HEI?

Universities have not always been so separated from society. Bourner points out the birth of the modern research university where the superordinate goal became 'the pursuit of knowledge for its own sake', only started in the 19th century Germany. In recent decades, the distance between HEIs and the public have grown. Recently, there have been numerous attempts to re-constitute the goal of higher education as enhancing citizenship.

Ultimately, such attempts confront the cultural barriers of science, as expressed in a recent review by the Kettering Foundation in the US: higher education is 'no longer built to the purpose of educating a citizen with the habits of mind and moral and ethical qualities essential to leading and defending a democratic society...the presumption of (scientific) neutrality has robbed the academy of its ability to effectively challenge society and to seek change' (Lawry et al 2009: 3-9). The report continues to spell out that as HEIs lose the ability to 'challenge society and seek change', so too do they lose the ability to effectively train the next generation of leaders – whether those leaders be in science or in civil society or both – to 'defend a democratic society'. While perhaps more passionate than other reviews on the subject, their sentiments are similarly reflected in the larger literature (Ellison & Eatman, 2008; Saltmarsh et al 2008; Kettering 2008; Imagining America, 2008).

Thus: HEIs are locked into the larger scientific culture which they helped to create. Changing one part of this larger system (be that HEIs or industry) is challenging without changing other parts as well. Repeatedly, the literature emphasizes the difficulty of the challenge, and the importance of building alliances within the organization and between different HEIs, as well as reaching out to other social sectors (Ellison & Eatman, 2008; Lawry et al 2009).

¹² The differential ease of access by diverse communities (based on class, race, ethnicity, religion etc.) to HEIs effects both the shape of the scientific community and any attempt for them to engage with the public. Space does not permit a fuller examination of this topic.

3. Organisational Learning for Change

In this chapter we skim the surface of a wide range of differing perspectives on organisations and organisational learning¹³. We start with a brief glance at organisations generally (4.1) and then at organisational cultures and one particularly powerful model of organisational development (4.2). We then turn to address how organisations learn (4.3). We proceed to some of the cutting edge practices in organisational learning, including systems thinking (4.4) and knowledge management (4.5).

3.1. Organisations

Organisations characterise modern society to the extent that this society itself has been described as the ‘organisational society’ owing to the fact that we live so much of our lives in the midst and as part of various organisations (Etzioni, 1964). Within any given organization arise issues of motivation (including reward and evaluation), roles and interactions, leadership, power and influence, the workings of groups and the culture (the ideas, values, etc.) of that organization¹⁴ (Handy, 1976). Shifting any of those aspects can affect other aspects of the organization.

It is hardly surprising that there are many schools of organisational thought. A few of them are summarized in Table 2. Much of the debate and the practical divides in organizational management are rooted in different conceptions of what it means to be human – these are reflected in the different schools of thought. Practitioners often find it useful to borrow from a variety of theories.

Table 2. Several Schools of Organizational Thought

1. Scientific Management	Built on studies of Taylor in 1880s in industrial settings. Rationalistic, mechanistic. Rarely used today but still influential.
2. Human Relations	Based on Barnard; organisations are built on co-operative communities, not made out of machines. 1930s. Importance of informal group
3. Bureaucratic	Based on Weber (1910 Germany) supported the power of bureaucracies. Continues to be powerful school of thought as well as practically useful.
4. Power, Conflict and Decisions	Based on Philip Selznick – organisations were political. Power, quantity and distribution important. People would go for ‘good enough’ solutions.
5. Technology	Joan Woodward in 1960s – technology of work makes a difference
6. Systems	Everything connects. Slow movements towards making this evolving science useful.
7. Institutional	History, leadership, goals and culture of each institution is important. There is a logic to their operations but it is not the one in the handbook.
8. Developmental	Organizational change can happen in a step-by-step process. Certain similarities in change process (similar developmental stages across organisations) but still highly unpredictable.

Sources: Handy (1999); Etzioni (1967); Hall (2000)

¹³ A detailed tabular summary of all existing conceptual models of organisational learning (OL), knowledge management (KM), can be found in Britton, 2005:pp 21-22). Furthermore, Malhotra For further reading – Malhotra, Y., (1996), ‘Organizational Learning and Learning Organizations: An Overview’ (<http://www.brint.com/papers/orglmg.htm>)

Easterby – Smith and Lyles (eds)(2003) The Blackwell Handbook of Organizational Learning and Knowledge Management, Blackwell Publishing, Oxford.

¹⁴ Other ways of looking at ‘important aspects’ of organizations abound: one example is the ‘Hard and Soft S’s developed by the consulting company, McKinsey: Structure; Strategy; Systems; Skills; Shared Values; Style; Staff. Woe to those who think changing the Hard S’ (first three) will make a difference without considering the Soft S (last four)! (Handy, 1999)

Raison d'être vs Survival

Within any given organisation, there are always (at least) two, sometimes contradictory, objectives. Their first is the official reason for existence, usually stated in their mission statement; their *raison d'être*. Their second, unofficial purpose, is the need to survive – their *survival* purpose. Often, the goal of organisational survival will surmount the organization's *raison d'être* (Etzioni, 1964).

Given this, in creating a new goal (such as encouraging public engagement) one must be aware both of how it encourages and enables the *raison d'être* of the organisation (public engagement can lead to better and more effective science that solves major societal problems) as well as enables – or at least takes into account – the survival goals of the organization (public engagement will generate greater profit, or bring in more funding to the department, or enable the organization to be seen in a positive light, etc.)

3.2. Organisational cultures

Handy (1999), one of the 'gurus' of business management, takes a page out of Anthropology when he asserts that people are inherently social beings and organisations are cultures.

Organisational culture refers to the shared meanings and understanding in a group. Within a given culture lies the formation of identities, knowledge, and learning, all of which effect behaviours and strategies (Knorr-Cetina, 1999 cited in Moisanders and Stenfors, 2009). Organisational culture is influenced by history and ownership (especially the values and persona of the founders and top management); size; technology (what is being produced as well as how technology is being used); goals and objectives; the larger environment in which it operates and the people in it (Handy, 1999).

Too often, organisations downplay culture, or treat it as something to be 'managed' – no doubt a result of the 'problem solving' ethos common in, especially, corporate culture (Harrison and Dawes, 2009). But people are not problems to be solved. Treating culture as something in need of yet another toolkit that can then be 'enforced' by management rarely works. "Toolkits and methods don't create change, it's the people who use them that do" (Pasteur, Pettit, and van Schagen, 2006:8). One can not predict what will happen when one interferes with a given culture.

Power and political dynamics are particularly important to pay attention to. This is an unfortunate lapse in much of the literature. Awareness of political dynamics enables people to engage in an open reflective process and develop personal and collective learning agendas and outcomes (Musyoki cited in Roper and Pettit 2005; 268-269).

Culture – different types

Given the importance of culture, it is of little surprise that there are numerous ways of describing it and attempts to measure it. Morgan (2006), for example, suggests six metaphors, all of which can have some truth in them: the organisation as machine, ecosystem, brain, culture, political system, psychic prison and institutions of domination.

Below, we illustrate the four famous types of organization as first put forward by Harrison (1972) and then adapted by Handy, who connected each organisational culture with a particular Greek God, leading to his famous 'Gods of Management' (1995) which remains influential. We include the main values underlying such organisations, based on our analysis of where they fall in a values development trajectory as developed by Hall. There are as many cultures as there are organisations, each with advantages and disadvantages.

Table 3 suggests four types of organisational culture as described by Handy (1999). Handy and Harrison hasten to qualify the framework, suggesting that many organisations incorporate multiple organisational 'types' into their organisation. In Wolcott's interview with Harrison, he suggested that science organisations tend to be 'Role Cultures'.

The table integrates Handy, who is, so far as we know, unaware of the Values Development Approach, within the Values Development Framework as described by Hall (2000) and as used by Joy

(2000). For ease of reading, the Values are in *Italics*. While the developmental perspective is not always agreed upon, we find it a useful framework, especially when one remembers that a 'higher stage' is not a 'better stage' – it is just different. The section on public engagement is our own analysis.

Table 3. Types of organisational culture and public engagement potential

Author	Organisatio n type	Drivers [& key values?]	Characteristics, Advantages and Disadvantages	Public engagement potential
Handy <i>Hall-Tonna</i>	“Club Culture: Zeus <i>Phase I: Authoritarian</i>	<ul style="list-style-type: none"> Decisions made by boss motivation by reward and punishment <p>Values: <i>self-preservation; survival; security; control; profit</i></p>	<p>Advantages:</p> <ul style="list-style-type: none"> effective for routine tasks with compliant workers; permits strong, quick decisions <p>Disadvantages:</p> <ul style="list-style-type: none"> can be dehumanizing, inflexible, non-adaptive 	<ul style="list-style-type: none"> Engagement with public one way—self-advertising information ('Telling') no capacity for accepting feedback, co-inquiry, co-governance
Handy <i>Hall-Tonna</i>	Role Culture: Apollo <i>Phase II: Managerial</i>	<ul style="list-style-type: none"> decisions made by management reward linked to function and merit <p>Values: <i>competence; work/labour; competition; economics/success; productivity; reason; efficiency/planning; hierarchy/order; law/rule; productivity</i></p>	<ul style="list-style-type: none"> role-based; decision procedures clear <p>Advantages:</p> <ul style="list-style-type: none"> stability, justice, productive, efficient some agency to workers <p>Disadvantages:</p> <ul style="list-style-type: none"> rules can constrain flexibility/adaptability/learning 	<ul style="list-style-type: none"> Can provide information and be open to feedback but without obligation to respond limited potential for co-inquiry and none for co-governance
Harrison Handy <i>Hall-Tonna</i>	Achievement - oriented Culture Task Culture <i>Phase II-III transition: Manager-Facilitator</i>	<ul style="list-style-type: none"> subsidiary management with top-down direction organization members each aligned with their team and its task in pursuit of common vision and purpose <p>Values: <i>service/vocation; creativity; self-assertion; education/knowledge; mission/objectives; pioneerism/innovation; research</i></p>	<ul style="list-style-type: none"> commitment to task (often narrowly defined) workers have agency emphasis on innovation teams can focus on task, but may lack capacity for collaboration with other teams and lose sight of both reality and larger mission 	<ul style="list-style-type: none"> engagement with public depends on this being accepted as part of the task given this, dissemination, conversation and co-inquiry are all feasible

Harrison	Support Culture	<ul style="list-style-type: none"> • Focus on mission/purpose • shared leadership—each has leadership contribution • consensus driven; coordination by peer group • people valued as individuals; mutual support <p>Values as above plus: <i>knowledge/insight;</i> <i>collaboration;</i> <i>community/supportive;</i> <i>mutual accountability;</i> <i>unity/diversity</i></p>	<p>Advantages:</p> <ul style="list-style-type: none"> • commitment to mission/purpose; • focus on relationships and mutual support <p>Disadvantages:</p> <ul style="list-style-type: none"> • can be weak on conflict management; can be indecisive • Ex: Independent doctors practice 	<ul style="list-style-type: none"> • values of this culture and its internal relational norms can support public engagement even up to the level of co-governance depending on how strongly different perspectives are valued e.g. how inclusion is supported as necessary recognition of human dignity extended to wider than own community. They should have capacity for • However, it could also have limited-to-no abilities for public engagement
Handy	Existential Culture: Dionysus			
Hall-Tonna	<i>Phase II-III: Manager/Facilitator/Collaborator</i>			

Hall-Tonna (2000) suggests that the different stages of organisations, reflected by their different values, are expressed especially through the style of leadership in the successive stages of: authoritarian, paternalist, managerial, facilitator, collaborator, servant, visionary (see Appendix). We suggest that the level of public engagement feasible without a shift in values will be determined by the stage characterized by the organisation’s culture—its values. The practical implication of this is:

- Knowledge of an organisation’s culture is essential to a realistic assessment of the feasible extent of its immediate willingness to engage with the public.
- Attempts to move to higher levels of public engagement might require programmes deliberately aimed at supporting values shifts¹⁵ and cultural change.
- Realization of higher levels of public engagement by organisations might best be approached incrementally starting with what is immediately feasible, acknowledging organisational culture and leadership style, and offering benefits valued by the organization e.g. public recognition.
- As successful examples emerge, encapsulate these as models and arrange for exchanges of experience.
- Engagement by the public similarly depends on engagement of those expressing values necessary for effective role performance at the level aspired to. The design of forums and other devices for securing public input needs to be suited to engagement with specific organisational cultures.¹⁶
- Reflection and awareness is key to any development. This confirms other research which points to the importance of reflection for organisational learning, as detailed below.

¹⁵ There are such programmes.

¹⁶ See Appendix for discussion of different designs of public engagement.

The last point deserves further exploration. For now, we note that given the variety of ideas of cultural and organisational change and development, it is useful for different organisations to bring to light their own perspectives about how change can, does and should happen –and what that means for them. This was done in Oxfam, with positive results, as demonstrated in Box 1.

In summary

In this section, we have looked at the importance of organisational culture, which is too often forgotten in the attempt to change organisations. We recognized some of the diverse ways of describing organisational culture. We suggested that a Values Development perspective sheds light on both how values underpin and shape the different types of organisations and how they might develop, and the implications of such an understanding. We teased out what this means for public engagement. As we ended, we saw the clear importance of reflection for learning and development. Thus, we now turn to organisational learning.

3.3 Organisational Learning

How does learning take place in organisations?

There is a long literature on organisational learning. We focus on some of the cutting edge work, and do not give a substantial summary of the history of how organisations learn.

Organisations, as systems, can learn. That learning is constructed of both individuals within the system learning and the organisation as a whole learning from the collection of individuals it holds, creating the ‘organisational *learning system*’ (Argyris, 1977). It is not to be assumed that organisations have the capacity to learn from all individuals – appropriate feedback systems are necessary.

Individual learning is highly influenced by the system in which the individual learns. As the highly respected learning theorist Stacy (2003) pointed out, learning is simultaneously individual and social. An individual’s learning is also highly determined by the individual’s worldview, which shapes what they prioritize (and thus pay attention to) (Ebrahim, 2003).

Learning is a process. Viewing it as such puts a strong emphasis on the importance of paying attention to individual learning and recognizing that there are different ways by which individuals learn. To enable one’s staff to learn, one must look at *how* those individuals best learn and work with that (Easterby-Smith & Lyles; Pasteur *et al*).

Action – practice – is essential to learning. While there are many different frameworks of the exact way in which learning takes place, it is widely assumed that some combination of action (practical and experimental engagement with the material), reflection (often with others) and practice are essential (elements of this can be found in Kolb, 1985, Mezirow, 2000, Heron, 1999, Argyris, 1977 and Pasteur, 2006).

Box 1 OXFAM: UNDERSTANDING CULTURAL CHANGE

Recently, Oxfam realized that different members of staff were operating with different notions of how change happens, which led to the creation of different and often competing types of programs. They found that making explicit their perceptions of how cultural change happened enabled them to recognize which ‘model’ they were working with. They created several ‘archetypes’ of change, described below.

However, while this enabled more purposeful interventions, none of these archetypes learn from the systems perspectives suggested earlier.

The Ladder: resolve immediate needs and accumulate resources and voice

Enlightened Elites: shift hearts and minds of people in power

People in the streets: building political pressure from below

A good example : show it can be done - localised success

Shock to the system: change is achieved when power structures can’t cope – weakness of elites is revealed, new institutions or leaders emerge

Follow the leader: change originates from individuals who, through example, inspire others

The power of belief: change comes through widespread consciousness-raising that shifts how people understand their rights and dignity. Values are critical.

Good old-fashioned democracy: direct exercise of democratic processes through community based participation.

Source: Eyben et al 2000

One point strongly stands out in most existing theories on learning, even though it is not easily acknowledged or admitted in practice: “learning is hard to do, not only for individuals, but particularly for organisations and groups of organisations. And when we do learn, we often learn the wrong things. Huge gaps often remain between our learning and our behaviour or practice”(Hailey J. and James, R., 2005:263). Gaps stem, in part, through the different levels of learning that people engage in.

Argyris, C & Schon, D (1978) famously described three tiers of learning: single loop, double loop and triple learning.

Single loop learning is what most organisations with a time bound, action oriented focus get stuck in, which Argyris defined as simply ‘detection and correction of errors’ (1977).

Double loop learning organisations begin to question underlying assumptions and cultures, identify root causes of problems and are more open to rethinking strategies of functioning. Similar to double loop learning, is Senge (1990) ‘*generative learning*’ which emphasises on continual experimentation, reflection and feedback to examining the set of assumptions on which the organisation has been established, whereas ‘adaptive learning’ on the other hand corresponds to ‘single loop learning’ and simply refers to coping and corrective mechanisms.

Triple loop learning is the highest form of ‘organisational self – examination’ and reflexivity, in which people within organisations will question the *raison d’etre*, the organisation’s reason for existence. It is very rare.

3.4 Ways forward in organisational learning for cultural change

One of the most important fields of thought to emerge and challenge older thought on human systems and how they learn is systems thinking. After briefly reviewing systems thinking, we highlight two substantial and relatively new and interconnected concepts in the literature that use systems thinking to enhance learning in organisations: the learning organisation and knowledge management.

a) Systems Approach

We suggest that a ‘systems’ approach is helpful in conceptualizing organisational learning. Applying ‘systems’ thinking to organisational learning is a relatively new field, which has its origins in hard sciences such as biology and computer science. According to the social systemic model, we are able to view organisations as ‘open systems’, and recognises the multi – tiered, non –linear processes of learning which arise out of the ‘interactivity of its parts’.

Capra, one of the fathers of systems thinking, usefully distinguishes between systems thinking, which is ‘contextual’ and its opposite, analytical thinking. Analysis essentially means taking something apart in order to understand it; whereas systems thinking implies putting it together with the context of the larger whole (1996: 29).

b) The Learning Organisation

The ‘learning organisation’, as first coined by Senge(1990) embodies many of the characteristics that we envision as essential for encouraging and achieving transformational change. That said, his perspective is not a developmental one. There is a tension here in the literature: On the one hand, authors such as Senge describe a ‘learning organisation’ as an organisation in which ‘you cannot *not learn* because learning is so insinuated into the fabric of life’ (ibid). On the other hand, one is always learning, regardless of the culture;

BOX 2: CHARACTERISTICS OF A ‘SYSTEMS’ APPROACH FOR ORGANISATIONAL LEARNING

A holistic perspective is necessary. Engage all aspects of the system in the process of change. Preferably, engage all aspects of the system in order to define the concerns of that system. This automatically ensures ownership. That said, it is difficult to ‘see’ the whole: visual maps and other aids are particularly helpful. Further, learning happens through relationships.

Change – especially cultural change, which is inherently complex – is emergent. Cultural change cannot be engineered. It is uncertain. Often, the motives driving change and impeding change are as much emotional and political as rational. The initial plan will unlikely be the final product; use that to your advantage.

The part and the whole can co-develop. Individual change and cultural change co-arise. Knowledge arises in relationships. Further, one should expect that just as scientific

it is a question of what one is learning. (One might be learning not to learn, for example).

A developmental perspective would suggest that different phases of cultural development learn differently; thus, depending upon what stage one is at will influence what kind of learning is possible. What Senge describes as a 'learning culture', values developmental theorist Hall would describe as a Phase III culture. It has an ingrained ethos of 'anticipating, responding and reacting to change, complexity and uncertainty. In other words it has the ideal 'learning culture'. For Hall (2000), systemic self-awareness entails a relatively high level of values development (including skills and behaviours). For other authors, the 'learning organisation' in both the profit and non-profit sector has become a "metaphor for managing change" (2005: 399). Most agree that transformative cultural change requires structural transformations that can only happen when the organisation becomes a "learning system"

Learning Organisations Vs Organisational Learning

BOX 3: CREATING A LEARNING CULTURE

- *Learning from experience*; encourage people to be engaged with pilot projects, try out new ideas, new ways of doing things, to discuss and talk and participate in the process as much as possible.
- Create *multi – tiered learning* within an organisation organizations; this includes encouraging informal learning networks, within and among organisations to come to the forefront. Often, there is a shadow system already in place in which the change one seeks is already happening, and these need to be highlighted.
- *Learning from failure*; too often, failure is punished, and the learning opportunity is lost. This necessitates forgiveness.
- Encourage and enhance ability for *reflection*

Source: (Harrison & Dawes, 2009).

The literature on Learning Organisations (LO), as opposed to Organisational Learning, is pragmatic. It describes how organisations can 'successfully acquire, share, and use knowledge to achieve organisational goals' within their organisation. It recognises that organisations are part of complex social systems over which they cannot exert full control. Instead of attempting to isolate itself or protect itself from its external environment (which the public is a part of), it emphasises that an organisation "ought to be closely attuned to it, embrace the opportunities that changing circumstances can offer, and, as more recent theorists have urged, 'ride the wave'" (Duesterberg and London 2001; Merron 1997). Many learning organisation theorists have 'developed an array of techniques and tools for doing diagnostics, examining patterns of behaviour in organisations, and engaging in 'transformative thinking' (Wycoff et al. 1995 cited Roper and Petitt, 2008;259)."

In summary, LO has a strong normative ethos informing their practice which includes a commitment to:

- appreciating different kinds of knowledge and learning styles
- encouraging dialogue; exploration of different perspectives and experiences; creative thinking
- collective working; breaking down traditional barriers or blinders within organisations
- fostering leadership potential throughout the organisation; reducing distinctions, such as those between management and staff, between strategists and implementers and between support and professional staff (ibid:259).

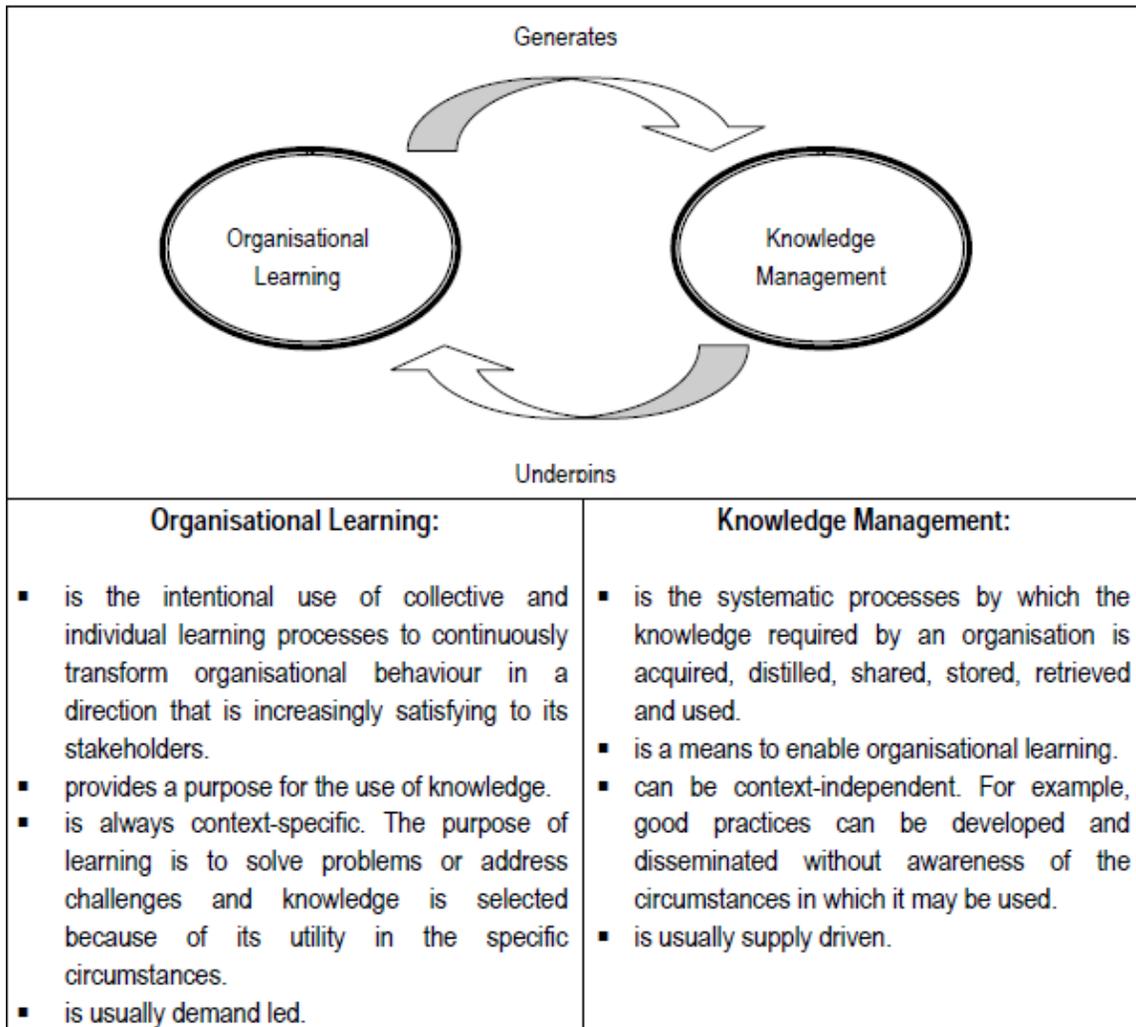
Clearly, different organisations will have different capacities to achieve this. Very little of it is likely to be achieved for its' own end: it needs to serve a particular goal.

c) Knowledge Management

Also important in a 'learning organisation – is how it acquires and processes information effectively into knowledge – Knowledge Management (KM). In the recent years many organisations have taken up Knowledge Management as part of their integral corporate OL strategy with full enthusiasm. While KM is inextricably linked to

OL it is not the same (Hovland,2003, Pasteur, et. al, 2006,Britton, 2005 etc.).

Table: Links between organisational learning and knowledge management (Britton, 2005)



To effectively learn, **one must be able to turn available information into accessible and useable knowledge**. The institutional processes and structures for enabling the transformation of information from diverse sources into corporate knowledge lie at the heart of KM (Skyrme, 1997, www.skyrme.com/insights/22km.html).

KM 'strategies commonly include 'mapping; drawing up the value chain of the organisation, gaining support from leaders, putting in place knowledge sharing systems and supporting IT, more importantly **strengthening Communities of Practice (teams and networks), using stories effectively, investing in new organisational processes, encouraging cultural change, etc.**' (ibid).

In the increasingly globalised world, with more efficient and comprehensive Information and Communication Technology (ICT) being developed, **the focus is on the external environment, and information and knowledge sharing between organisations as opposed to only within the organisation** (Pasteur, Pettit, and van Schagen, 2006: 11 -12). This distinguishes it from OL, and makes it especially useful for public engagement.

Therefore, we recommend that as organisations learn for public engagement they pay attention to how to use knowledge management systems for this purpose. Further research is needed to tease out the theoretical and practical implications of doing this.

BOX 4: LEARNING TO ENGAGE THROUGH KM

ESRC's '**Evidence Based Policy and Practice Initiatives**' in the UK which is a collaborative network of seven research units which aim to bring the social sciences to engage with policy decision making¹. Culminating out of this project was the interesting framework developed by one of the research units for understanding 'evidence into practice' by shifting from researcher as disseminator to 'practitioner learner' (Nutley, Walter and Davies, 2002 cited in Hovland, 2003:14)

This example illustrates the potential of KM as a process for embedding public engagement with science at two levels, first of science institutions engaging with one another, and second, of sharing and creating a knowledge base for public engagement with science – which in turn initiates the process of cultural change towards actually engaging with other sections of the public.

3.5 Summary

This chapter reviewed a wide range of literature on organisations, organisational change and organisational development. We looked briefly at the nature of organisations, recognizing that any given organization contains issues of motivation (including reward and evaluation), structures, roles and interactions, leadership, power and influence, the workings of groups and the culture (the ideas, values, etc.) of that organization. We saw different perspectives on how to conceptualize organisations, and found that scientific culture can be described as an 'achievement culture' with both its advantages and disadvantages. We offered a developmental perspective as suggested by the less-well-known Hall-Tonna developmental paradigm, suggesting that values underpin organisational culture and that these values can and do develop.

Given the centrality of learning, we presented some of the literature on organisational learning. Going beyond the behaviouralist and rational perspectives to learning, we suggested some of the newer perspectives offered from systems thinking, including knowledge management and organisational learning. From systems thinking, we found that instead of viewing change as linear, we can see it as an unpredictable and emergent process. To work with such a process in an organisation, close feedback loops which give ample room for experimentation, mistakes and re-learning are necessary. Since we live in a dynamic and increasingly unpredictable world, learning has to become a fundamentally continual process and not a time bound intervention. While we have included practical elements in this chapter, much of it (and the literature it is based on) is normative rather than empirical; it is easier said than done. We now move into a brief enquiry into common barriers and opportunities for change.

4. Challenges in Practice

4.1 Recognising Internal Barriers to Organisational Learning and Change

Culture shift shifts power within an organization, and, in this case, within the system as a whole. Indeed, a major objective here is the empowerment of citizens. But power shifts can meet resistance, and power holders will need to feel reason to relinquish power. Resistance can stem from threats to territory/capital (social and financial) and differences in ideologies/goals (Handy, 1999).

Resistance to change is normal and needs to be respected. After all, it takes time to find our comfort space, our sense of identity and purpose in this system and finally have an inkling of contentment. Of course, while resistance might be normal, that doesn't make it easy to deal with.

Conflicts over either one can lead to fear, anxiety, and other strong negative emotions in the organization. This leads to a lack of trust, all of which inhibit learning (Harrison & Dawes, 2009). The culture of the organization is, unsurprisingly, itself one of the greatest barriers to changing the culture of the organization.

4.2 Different goals/ideologies

Different ideas about formal objectives, roles, unclear contractual relationships and concealed objectives are clear and common causes of resistance or other forms of conflict over change (Handy, 1999).

Often these different goals and ideologies can lead to communication breakdowns. These could manifest as: confusion within the team leading the process, poor communication between the change-management team and the rest of the organization, the lack of a central locus who knows what is going on and who is responsible for what, inconsistent policy decisions (for example, claiming the value on public engagement and decentralization but not allocating the financial resources necessary to bring this about); uncomfortable and unfamiliar levels of uncertainty can lead to rumours; ambiguity about the direction of change, outright lying in order to avoid changing habits, and a tendency to omit information.

As will be elaborated below, leadership plays a critical role in cultural change. When leaders don't approve of the goals of the change – or when they don't want to do the work to make them happen – they might encourage a 'learning prevention' cycle by not incentivizing or explicitly prioritising learning, and where people rarely dare to go beyond single loop learning (Britton, 2005:13).

4.3 Disputes over territory

In particular, resistance comes from real or perceived threats to 'their turf'. We include in this general threats to their capital (social, financial, etc), their identity. Substantial change often implies shifts in roles and subsequent shifts in power which is likely to lead to a loss of control. Senior managers are often suspicious of organisational learning for change because of the importance attached to the process as well as the outcome (Britton, 2005:16).

For example, Taylor (Taylor and Boser, 2006) relays his own experience at attempting to create change within an HEI. One of the barriers he faced in creating change in the teaching program was that while the broad goals were agreed upon, the specifics – and the changes they necessitated – elicited strong and often unexpected resistance from faculty members. It was suggested that the process had lost its legitimacy; communication was confused and the process became circular. In this case, cultural capital was invested in the existing qualifications of the teaching program and changing it was viewed as threatening that cultural capital.

Organizational change has a psychological and emotional component

People often become afraid and anxious of change. These emotions play a decisive factor on not only how people react to change but also their willingness to deeply engage with the process of change. It is quite difficult to predict who and in what way these emotions will play out in any change process.

Particular challenges for 'achievement-cultures'

It goes without saying that culture plays a significant role in changing culture: that is much of the challenge. In achievement-orientated organisations such as scientific institutions, changes that are perceived to effect ability to achieve the goal (better scientific knowledge through certain processes that frequently do not include the public) will almost certainly encounter strong resistance. Within higher education, additional barriers to change can also include the disinterest of scholars in the general public, inadequate conceptions of what effective democratic education might look like, a fragmented and compartmentalized movement with different uses of language and dominant epistemology that runs counter to the agenda of civic engagement (Lawry, 2009).

BOX 5 CARE: LEARNING TO LEARN

The example of CARE (Beckwith, et al), an International NGO is a case of its best practice as a 'learning organisation' through its decentralised nature of its 'system', as well as an organisational mandate that arose out of a participatory process. This allowed the Latin America Unit to create their own space for leadership and innovate in planning, programming and learning or in other words its 'KM' strategies. The question however remained, how the organisation would handle the tensions generated because of the exemplified mid-level leadership which is ahead of the seniors and the rest of the organisation, which is inextricably linked to trust or the lack thereof (cited in Roper, L. and Pettit, J. 2005:267)

5. Enabling Aspects and Attitudes for Learning: Key Lessons

In this Chapter, we suggest key lessons through enabling aspects and attitudes for learning for public engagement. First we suggest three different ways organisations might experience the 'mandate' for change. Then we look at enabling aspects. While this is primarily a summary of many different literatures, we elaborate on key elements where appropriate. Finally, given the importance of one's attitudes when enabling change, we suggest key enabling attitudes.

Mandates for change

There are several ways in which organisations might be induced to practice public engagement¹⁷:

- *Hierarchical Mandate for change.* Policy from above (government; education authority; with/without force of public opinion; senior management) requires it.. This may or may not include the use of consultants or outside 'help'.
- *Inclusive Mandate for change.* A reflective and inclusive process of addressing the pressing needs of the system from which emerges the need for greater public engagement. All parts of the system are included. Expectation that they might lead in an event organized by a 'higher authority' might encourage such reflection and subsequent change
- *Subversive Mandate for change.* Within the organization there are those pressing for engagement with the public but it is not necessarily pushed by top management. This often requires champions, alliance-building, mobilization of internal and external understanding, ownership and support for the innovation.

Each of these processes would entail a different process and communication strategy. We now move onto exploring in more details key aspects that enable an organisation to have a deep and meaningful learning process, and the attitudes that people within the organizations, especially the management, that encourage and nurture learning cultures.

5.1 Enabling aspects

Time

Organisational change should be measured in years, not months or weeks. Time can also be an enabling condition: failed projects can circle back years later to make a significant impact on cultural change. 'Transformative leadership is a never-ending process to be measured in years, not weeks or months. Commitment to the practice is essential' (Astin et al).

Focus

Given that most scientific organisations entail a strong component of the *Task culture* (as explained above), high importance needs to be placed on getting the task - the reason why science is engaging with the public and what that means for that organization – correct. It is well worth investing time and resources in at the start of a project.

Whenever possible, we encourage an *inclusive mandate* to arise. Box 6 illustrates a good example from the United States. Of course, the ease of such a process would depend on the pre-existing organizational culture – a 'Phase I' organization would find this not only laughable but nearly

Box 6: RECOGNISING LEARNING OPPORTUNITIES

In the United States, a University went through a long and lengthy process of discussing 'What is public engagement, why it should be included in the core of the organisation's processes?', and dealing with the various resistances across the faculty and staff. Once accomplished, there was a high degree of ownership of the idea. Furthermore, in the process, staff and faculty gained skills (listening, trust, building alliances, facilitation, etc.) that were necessary for engaging with the public in anything more than just 'dissemination' (Ellison & Eaton, 2008).

¹⁷ These three categories comes from Wolcott's own synthesis.

impossible. Once the focus is found, it must be appropriately communicated throughout the organization.

Leadership¹⁸

There is little doubt that leadership is critical for organisational change. But what do we mean by leadership?

In a recent report on leadership and higher education for the Kellogg Foundation, Astin et al defines a 'leader' broadly: 'anyone who serves as an effective social change agent' (2). Most OD literature sees it as managerial and executive leadership. For hierarchical organisations, such as most HEIs, leadership of the CEO is essential for any kind of transformational change (Plantan, 2008).

Leadership might best be seen as a capacity of a system with different organisational cultures distinguished by their leadership styles. Leadership is to be distinguished from authority—the power to allocate resources and set rules (Joy, 2005). See section 4, and Table on Leadership Development in Appendix.

The broader definition of leadership offered by Astin et al (2008) and the systemic analyses offered by Joy (2005) both build on a particular perception of power as something that exists within any given actor in the system. This has significant implications. Understanding the nature of leadership within an organization provides guidance to building support for an organisational shift. Thus, in the case of Taylor's challenges to shift the teaching program in a reluctant HEI offered above, he was able to build alliances with those who did and, eventually, who did not agree with his suggestions. Similarly, within the UN system, middle-management has been able to successfully come together and lobby top management to create a more 'green' (carbon neutral) UN system (UNEP, 2009).

These individuals are often seen as 'champions' of a particular change process; they need to be discovered and supported. The role of these champions is different at different stages of system development (Joy, 2005). It would have been particularly difficult for either Taylor or the 'middle men' in the UN to have effected those changes in a more strictly hierarchical, 'club culture' organization. However, in the culture in which they worked, they were able to both effect change and to stretch the organization to develop a more sophisticated and empowering notion of leadership.

Fostering leadership throughout the organization is often found to be critical to creating a strong 'learning environment'; however, in those organisations which are more hierarchical, such democratization of the workplace can be threatening to their conceptions of power (Oswald, 2009; Roper & Pettit, 2002). Interestingly, Harrison suggests that democratic organisations are generally easier to induce a higher level of public engagement, as they have greater institutional capacity for dealing with diverse opinions.

Skills

New roles will require the application of new skills. We have emphasized the need for supporting skills development. Both the needed skills and structures have been explored in the literature (for example: Inglis 2007; Ross 2009 and, Fischer 2000). As has been noted, the more comprehensive we seek public engagement to be, the more complex the skill set called for, which requires an organisational culture with the capacity for supporting and appropriately rewarding those skills.

Design

Elements of a good design process for enabling public engagement (or any change) include:

- (i) *A steering committee* within the organization with a - clearly defined mandate to co-ordinate and facilitate the change process (Joy, 2005)

¹⁸ Please refer Appendix for a typology of leadership (Joy, 2009)

- (ii) *Securing ownership of clearly defined roles and responsibilities* for different the systems stakeholders (Handy, 1999, Joy 2005). Aragon (2009) found that creating a participatory process for creating a visual map of what is happening, what needs to change in order for the desired shift to occur, promotes shared understanding and clarity about roles and responsibilities for that change is particularly useful.
- (iii) *Building competencies to fulfil roles through on-the-job*. This classic need is found throughout the literature but too often forgotten (Handy, 1999; Joy, 2005).
- (iv) *Allocating resources (material, financial, equipment, travel, training, personnel support/ mentoring, etc) for both capacity building and ongoing activities* (Aragon, 2009; Joy, 2005)
- (v) *Create, highlight and encourage participation in pilot projects* Particularly important since learning is, for most people, an experiential process (Oswald, 2009)
- (vi) *Reward performance of new functions*: Opportunities for reward and celebration can also be found in the natural cycles of an institution¹⁹. This can be more casual than (vii).

In the United States, a recent review of reconstituting the reward system to support public engagement in higher education encourages re-defining scholarly and creative work; developing academic policy based on a continuum of scholarship; recognizing excellence of work that connects diverse domains of knowledge; expand, documenting and presenting what counts; expanding the community of peer review to include ‘the public’ as appropriate; building in flexibility for public engagement at the point of hire; and promoting public-engagement scholars to full professorship (Ellison & Eatman, 2008). There need be no intellectual compromises.

(vii) *Amend Measurement and Evaluation/assessment to include public engagement*.

“To value something fully, one must evaluate it fully” (Ellison & Eatman, 2008). Evaluation when conducted for an external actor (e.g., a donor), is found to rarely contribute to the learning process of an organization. Monitoring and evaluation that engages all system actors is essential to a learning, adaptive system (Arnkil et al, 2002; Oswald, 2009). Inclusive deliberation regarding performance indicators for the design of M&E and valuing stories in addition to numbers, are two important elements of designing M&E for organisational learning and change.

M&E should include individual assessment *and* organisational assessment (Joy, 2009).

Thus, even as individual assessment might change (does Dr X include greater public engagement in his research?), so too needs there to be a system for to assess the overall progress of the organisation in achieving its own learning objectives (has this institution met its own or external performance objectives?) This should include not only focus on results (in the ‘management by results’ style) but a focus on shifts in relationships and personal changes (i.e., changes in attitudes, mindsets and behaviours) (Bivens, 2009). Common sectoral standards can also be useful.

In this paper, space does not permit the longer focus on M&E and appropriate evaluation for public engagement that would be helpful for that. In particular, the more public engagement is seen as a co-inquiry and co-governance perspective, the more one needs to include the public in the structure of evaluation and accountability. ‘Downwards accountability’, as taken up recently by NGOs such as CAFOD, will give the public greater ability to engage in M&E and thus reflect their nature as stakeholders. Further research is needed here.

¹⁹ This will differ across organizations. For higher education, faculty retreats, graduation ceremonies, evaluations, and academic breaks can all offer times to reward and celebrate public engagement (*). Elsewhere, emphasis is placed on rewarding new initiatives (Taylor & Boser, 2008) and enabling scholarships and fellowships/grants for work that includes public engagement (*).

5.2 Enabling attitudes

When trying to change culture, one needs to pay particular attention to attitudes and language (Taylor & Boser, 2006). 'The change management system must embody the values of the change it seeks to create' (Joy, 2009). Or, more famously: 'Be the change you wish to see'. The change process should model the values and goals it seeks to produce.

Reflectivity: 'By definition that which is deterministic cannot learn'. Organisations must encourage the space for reflectivity and systemically feeding that into the learning continuum. Participatory methods/social engagement are useful ways to enable people to participate and can enable the overall change process, though they can be threatening to hierarchy and bring personal fear of exposure, breaking loyalty, or unwise use of time (Chambers, 2002). Eyben (2003), based on her experience of working as a senior official in DFID, notes that reflexivity is particularly challenging for people in senior positions, particularly donors.

Respect: Respect others, be they the public, the scientists, or one's co-workers In particular, respect resistance- it is there for a reason. Find ways to phase out/phase in the 'old work horses' (Joy, 2009).

Humility: Engaging with the public – or even other departments in one's own organization – requires humility (Fortmann, 2009).

Patience: Patience is a necessary prerequisite for the commitment this work entails.

Persistence: a common feature in almost every successful example of cultural change (Bivens, personal communication, 2009; Arnkil, 2009).

Trust: Mentioned in nearly all of the literature, having trust in the process, in one's colleagues, building trust, maintaining it when people make mistakes.

6. Conclusion

We started this paper asking, ‘How can organisations have a learning journey which embeds the particular goal of greater public engagement?’ The underlying challenge of taking any action towards achieving it remains that it requires a mass cultural change in British society, given the intertwined nature of the broader scientific culture and any particular organisational culture. For scientific organisations to learn to engage with the public, and in such a way that the higher levels of public engagement are able to be realized; requires substantial cultural shifts in the culture of science – and the larger system of the ‘public’ in which it is embedded.

Thus, we must not forget that there is a noble potential in this process, what we describe as a ‘twin goal’ of enhancing science’s ability to solve society’s problems and to enable citizens to participate in the decisions that affect their lives. It is a culture that can one day be the norm. But reaching it requires a significant shift in both the cultures of scientific institutions, and of common perceptions and processes of public engagement.

For this to occur, learning is necessary – of this we have no doubt. Learning is fundamentally about integrating information – be that information or experience – for use. People must thus have access to knowledge – especially experiential knowledge, as we find again and again that it is through experience with public engagement that people become champions of public engagement. And they must have some ability to reflect on what they experienced (including, possibly, what they read). This must happen over a long period of time, as learning is a process; workshops alone are insufficient, though those can help plant the concepts for later use.

Learning is about ownership – taking a new idea, or a new system, and making it your own. That is partly why participation is key to learning, as participation can help us have learning. Ownership can not be forced. A certain degree of willingness is necessary. When resistance occurs, working with, not against, the staff is essential. As goals become clear, and ownership grows, it is possible that appropriate processes shall emerge. As appropriate processes emerge, structures, roles, etc. can begin fall into place. Easier said than done.

We found many questions for future research. These include: What are the appropriate measurements, evaluations and appraisals for public engagement in science organisations? What is the scope of values development framework in encouraging these shifts? What are the appropriate structures for ‘public talk’? What are the lessons from those organisations which have already been engaging with the public, such as CSR or initiatives by the public sector such as decentralization? Further work is needed to ground these ideas into the particularities of the British science-public discourse as it relates to specific British organisations. That said, one is also tempted to ask, what about the non-British system – what are the best ways for engaging with the international community in these challenges? What are we ourselves not paying attention to in this process?

Throughout the paper there was the familiar tension between the inner and the outer. Organisations are nestled in a larger system: now, more than ever before, those boundaries tend to be fluid, and learning organisations and knowledge management systems seek to use that fluidity to the advantage of individuals and institutions’ learning processes. However, ultimate solutions only exist ‘out there’ to an extent – any organisation’s staff is generally its most valuable resource, and may well be the source of inspiration and leadership for change. Harrison suggests that any given organization *probably does not know that it knows* what it needs to address its own problems.”

Breaking down barriers to enable that staff knowledge, experience and initiative to be released for this task is valuable and can be highly motivating, though it can also be threatening to the staff and the organizational structure alike. Given the inner-outer tension, we recommend that SFA or another appropriate body take on a networking and an active learning oversight position, recognizing that it can only go so far in its role to achieve this. Given that no culture has ever accomplished this task before, there is little room for anyone pretending to be an expert. There is, however, ample room for learning how to learn - which is just as well, given the task at hand.

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7. Appendix

Appendix 1

Table 1: Leadership demands at successive phases of organizational development.

NATURE OF SYSTEM →	AUTHORITARIAN (Phase I)	CONSULTATIVE MANAGERIAL (Phase II)	PARTICIPATORY (Phase III)
Who performs leadership roles	The boss. Others respond to command, governed by rules.	Top management. Others largely rule-governed with varying degrees of initiative supported. System may be either paternalistic or run for benefit of owners/shareholders.	Potentially everybody. Self-authorizing initiatives supported. Community decides what is good for community.
Basis for response to leadership	Coercion	Acceptance of rules induced by incentive/penalty or degree of acceptance of goals of organization	Ownership of, identification with, goals of collectivity and acceptance of personal responsibility to meet or exceed demands of role.
Who provides inputs to decisions	As decided by the boss who may be affected by uninvited as well as invited feedback.	Feedback solicited by management who may or may not be responsive to this or uninvited feedback.	Consensual decision processes provide for voices with various degrees of inclusion.
Who gives effect to decisions	Orders issued by boss; implementation dependent on coerced or willing response.	Directives emanate from different levels of management hierarchy.	Authority for implementation given by consensus for action on agreed/negotiated resource allocations; shared expectations regarding performance of roles.
The accountability structure	Everyone accountable to the boss. The boss accountable to no-one (though vulnerable to potential revolt).	Hierarchy of accountability.	Mutual accountability as well as hierarchical accountability based on values and principles more than on rules.
Needed leadership competences	<p>The boss needs:</p> <ul style="list-style-type: none"> • ability to hear/make reality checks • charisma (for cult) and/or threat of coercion to secure response to commands • systems thinking skills • imaginal skills <p>Others (followers) need compliant skills.</p>	<p>Management needs:</p> <ul style="list-style-type: none"> • ability to hear/make reality checks • threat of penalty to secure response to directives • systems thinking skills • imaginal skills <p>Others need compliant skills with imaginal, communication, and systems skills as required by the demands of management.</p>	<p>Authorized leader needs:</p> <ul style="list-style-type: none"> • interpersonal skills • communication skills to meet cognitive gaps • facilitation skills • empathic skills • imaginal skills • systems thinking skills • ability to hold the tension with constructive confrontation • self-awareness • self-authorization • negotiation skills • ability to keep ego in its place • ability to handle projections onto self • values required at next developmental step for system • ability to model these with integrity • ability to resist abuse of privilege • non-attachment to specific outcomes <p>To the extent that other actors share these skills they will enhance the leadership capacity of the system.</p>

Source: Leonard Joy, part of UN report in 2006

Appendix 2

This appendix provides a summary of structuring public talk as developed by Inglis (2007) and Ross (2007). Rarely found in 'mainstream' literature, their example offers an intriguing perspective on the process of public engagement. More research is needed to discern what this means for public engagement in science-specific issues.

Inglis (2007) defines four types of 'public talk':

- **'Casual talk'**: general office chatter
- **'Opinion talk'**: or general and reactive statements
- **'Strategic talk'**: adding to 'opinion talk' the linear cause-and-effect logic that supports those responses—e.g., if we do activity 'x' then the outcome 'y' will happen
- **'Facilitated dialogue'**: which includes the skills of strategic thinking and adds the systems skill of recognising and grasping complexity by noting the connections between peoples' various perspectives, concerns, situations, and relationships.

This last skill, in particular, is complex, and not expected to be held by the majority of the population. Concerned to reduce the likelihood of public engagement being reduced to unproductive 'casual talk' and 'opinion talk', several authors have proposed ways to enable collective deliberation on complex issues for multiple actions by multiple actors. They advocate addressing different perspectives from the beginning of the change process. This should evoke statements of presumed legitimate interest by each party for endorsement or challenge. It should seek to secure agreement to respect and support the realization of legitimate interests. It could raise conflict of interest that would need to be resolved.

An outline of this successful process, borrowed from Inglis (2008), is below. While this comes from a public forum, not a forum where the public was engaging with a specific scientific body or problem, it could be manipulated for processes of internal organisational development and public-organisational development (Ross, personal communication, 2009). Further research is needed to do this appropriately.

1. Identify the system (system x) of concern for policy formulation and management. (e.g. GM foods; HIV-AIDS; nano-technology; science policy, etc.)
2. Explore the impact of the development/design/introduction/experience of system x. Develop visual schematic map of system x and its impacts.
3. Use development of map to secure ownership and participation of all participants
4. Clarify potential questions and concerns given rise to with regard to system x behaviours/attitudes/institutional structures that make that topic problematic
5. See how these are inter-related.
6. Identify objectives with regard to these questions and concerns. Brainstorm new actions.
7. Review intervention points in the system suggesting whose behaviour needs to respond. Choose one action.
8. Turn action into question
9. Look at how to answer this question from 4 different perspectives.
10. Create templates of motivations, assumptions and specific actions for each 4 approaches; Compile Issue booklet. Ensure all perspectives are heard and understood.
11. Next actions? Steering committee to guide it to next steps?
12. Open to larger public.

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