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Learning how to do things differently: challenges in sharing tacit knowledge for agricultural and rural development (with examples from India and Namibia)

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Abstract

Learning alliances (LAs) are considered to be a more sustainable alternative for sharing knowledge than research projects, because they enable flexible partnerships between a larger range of organisational levels, combine local adaptation with sharing of experience in a wider community, and are less constrained by project time horizons. This paper argues that, even though LAs have a number of advantages over projects, effective knowledge sharing and creation of innovations can only happen if there is a strong element of action research involved, which enables alliance partners to share the tacit knowledge embedded in technologies and innovations. Innovations both build on existing knowledge, and generate new knowledge. This knowledge can be either explicit (i.e. it can be codified and transmitted in a generally understood form, such as text) or implicit/ tacit (i.e. embodied in individuals and their skills and experiences). The tacit knowledge component of innovations is harder to share and scale up than those components that can be codified – leading to an inconsistency in knowledge transfer. In agricultural development, most innovations are nowadays about “doing things differently”, including new ways of interacting and organising, rather than “doing different things”, such as growing new crop varieties. These innovations have a very high component of tacit knowledge. While some authors have argued that tacit knowledge can be transferred into explicit knowledge, this paper argues that some forms of tacit knowledge can only be shared through “knowledge in action”, e.g. doing things together. Therefore action research projects provide a valid component of learning alliances. The paper illustrates this with two cases from agricultural research that involved multi-agency, multi-disciplinary teams.

Introduction and approach used

This paper emerged as a result of the author enrolling in a course on “Managing knowledge” as part of the Open University’s MBA programme. The module introduces a range of concepts, approaches and techniques to knowledge management, including communities of practice and other institutional mechanisms. While the course is not specifically addressed at development professionals, it provided many insights into issues of knowledge sharing and organisational learning that are highly relevant for agricultural and rural development initiatives.

This paper attempts to **apply some of the knowledge management concepts** from the course to better understand **the role of learning alliances, communities of practice and research / development projects** in generating and sharing knowledge.

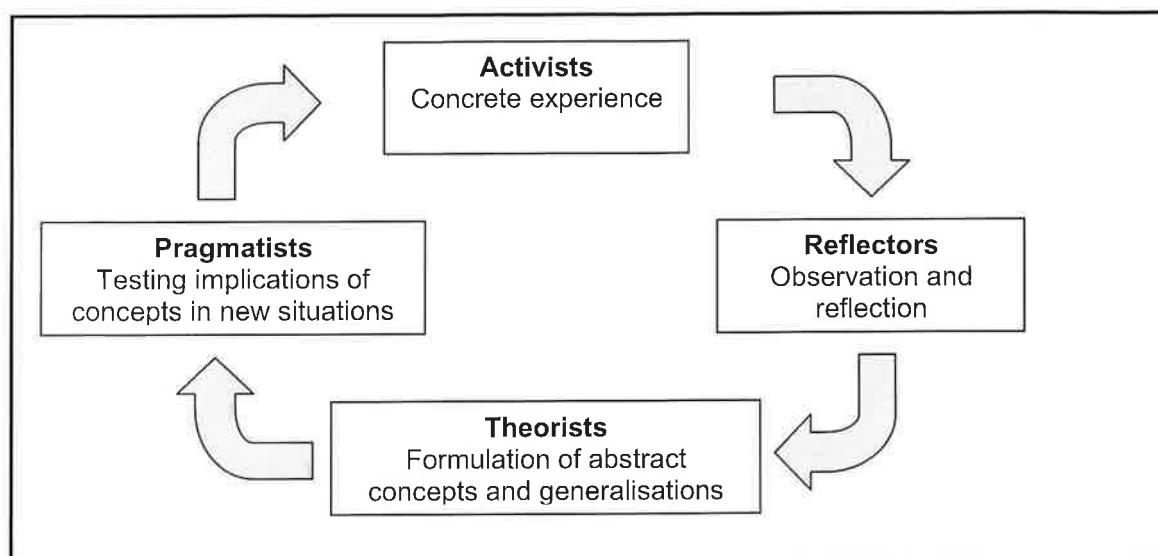
The focus is on **tacit knowledge**, because this type of knowledge has been largely neglected by conventional approaches to technology transfer. The examples used are drawn from the author’s experiences working in India and Namibia.

Knowledge, learning and action

Learning is closely linked to knowledge, because knowledge is created and shared through learning. Xerox defines knowledge management as “*the discipline of creating a thriving work and learning environment that fosters the continuous creation, aggregation, use and re-use of both organizational and personal knowledge in the pursuit of new business value*” (Cross, 1998, p. 11). Generating a ‘learning environment’ is a challenge for organisations in all sectors – private, public and not-for-profit – and one could replace the phrase ‘in pursuit of new business value’ with ‘in pursuit of value for money’ for a public or not-for-profit sector organisation.

Kolb describes in his much-cited “learning cycle” how individuals create knowledge and learn through action. Depending on personality and preferences, individuals tend to be stronger in different aspects of the cycle – therefore it is useful to include different “learning types” in a team to ensure that all stages of the cycle are adequately addressed. He stresses the importance of action as an essential component of learning.

Figure 1: Kolb’s learning cycle (Source: Kolb, 1981)



Tacit and explicit knowledge

In Kolb’s model, learning results in “abstract concepts and generalisations”, which are then tested and adapted to new situations. However, abstract concepts are only one type of knowledge – others include practical skills, intuition, and judgement. Many authors have tried to classify knowledge into generic categories that have distinct characteristics. The classifications generally differentiate between tangible or explicit knowledge types (knowledge that can be codified, transmitted and stored in a generally understood form, such as text), and intangible or implicit types of knowledge (knowledge that is embodied in individuals, technologies, processes or societies and cannot easily be captured or stored).

Table 1: Knowledge classifications

Author	Largely tangible	Largely intangible
Polanyi (1958)	Explicit knowledge	Tacit knowledge
Gibbons et al. (1994)	Mode 1 knowledge: “The complex of ideas, methods, values and norms that has grown up to control the diffusion of the Newtonian model of science to more and more fields of enquiry and ensure its compliance with what is considered sound scientific practice.”	Mode 2 knowledge: “Knowledge production carried out in the context of application and marked by its: trans-disciplinarity; heterogeneity; organizational heterarchy and transience; social accountability and reflexivity; and quality control which emphasizes context and use dependence ... [It] results from the parallel expansion of knowledge producers and users in society”.
Blackler (1995)	Embrained knowledge Encoded knowledge	Encultured knowledge Embodied knowledge Embedded knowledge

Underlying these classifications are fundamental differences in the way knowledge is perceived. Early writers on knowledge tended to stress explicit knowledge, such as scientific knowledge, and assumed that there is a “reality out there” that can be captured and understood in an objective way. According to (logical) positivism, there are only two sources of knowledge: logical reasoning and empirical experience (<http://www.iep.utm.edu/l/logpos.htm>).

However, Gibbons et al. argue that there are types of knowledge which are equally or even more important than scientific knowledge; they summarise these under “mode 2 knowledge”. It acknowledges the contextual nature of some types of knowledge, and its social construction. The constructivist view of knowledge stresses that knowledge is rarely free of context and therefore sharing of knowledge needs to take into consideration that different people perceive things differently. Therefore, any sensemaking activity (i.e., a joint process of gathering and interpreting a body of information potentially relevant to a problem) will inevitably involve negotiations about meanings, as these are viewed differently by the different parties involved in the activity. Weick (1995) suggests that ‘sensemaking’ is grounded in both individual and social activity, and that individual and group activities are inextricably intertwined. According to him, situations become ‘real’ only through the interpretive processes of sensemaking which reveal how different parties construe the situation.

Box 1: Blackler’s knowledge categories

Embrained knowledge links together the concepts of cognitive ability, abstract knowledge, knowing that or knowing about, and double-loop learning, all of which are focused on the individual, with shared visions and systems thinking, which have organizational scope. Here the individual has power derived from internalized knowledge that cannot be easily captured.

Embodied knowledge links know-how and sensory or empirical knowledge derived from action and experience, plus problem solving based on tacit knowledge, with the importance of context. It is therefore focused on the individual, within a context, and the individual derives power from this.

Encultured knowledge moves us firmly to the level of the group or community since it focuses on knowledge that is shared through socialization and shared language. However, the ability of any agency (including senior management) to control the ways in which knowledge is encultured and then communicated may be limited since the culture is created collectively.

Embedded knowledge is knowledge that is captured in systems and routines. It is therefore outside any individual – it is interpersonal, as well as embedded in technology and structures. It is therefore amenable to strong centralization of power and hierarchical control.

Encoded knowledge is knowledge that has been externalized and captured in code, and is therefore available to anyone who can understand the code. It makes individual knowledge widely available, removing power derived from knowledge from the individual, and again it is open to strong concentration of power and control.

After Blackler (1995)

What does this mean for development practitioners who want to share knowledge and engage in joint learning activities? The key insight is that different types of knowledge constitute different types of challenges to those who want to share them. Tacit knowledge, which is either embedded in systems and processes, embodied in the skills and experiences of individuals, or encultured in social norms and world views, can not easily be captured and shared in media traditionally used for scientific knowledge, such as written text. Therefore, different approaches and techniques to knowledge sharing are needed.

Table 2: Knowledge components of different types of water-related innovations

Knowledge types	Water purification tablets	Hand pump	Farmer-managed irrigation	Community water rights	Logo of the NGO "Water Aid"
Embrained	Medium	Medium	Low	Low	Low
Embodied	Low	High	High	Medium	Low
Embedded	High	High	High	High	Low
Encoded	Low	Low	Medium	Medium	High
Encultured	Low	Low	High	High	Medium

Source of categories: Blackler (1995)

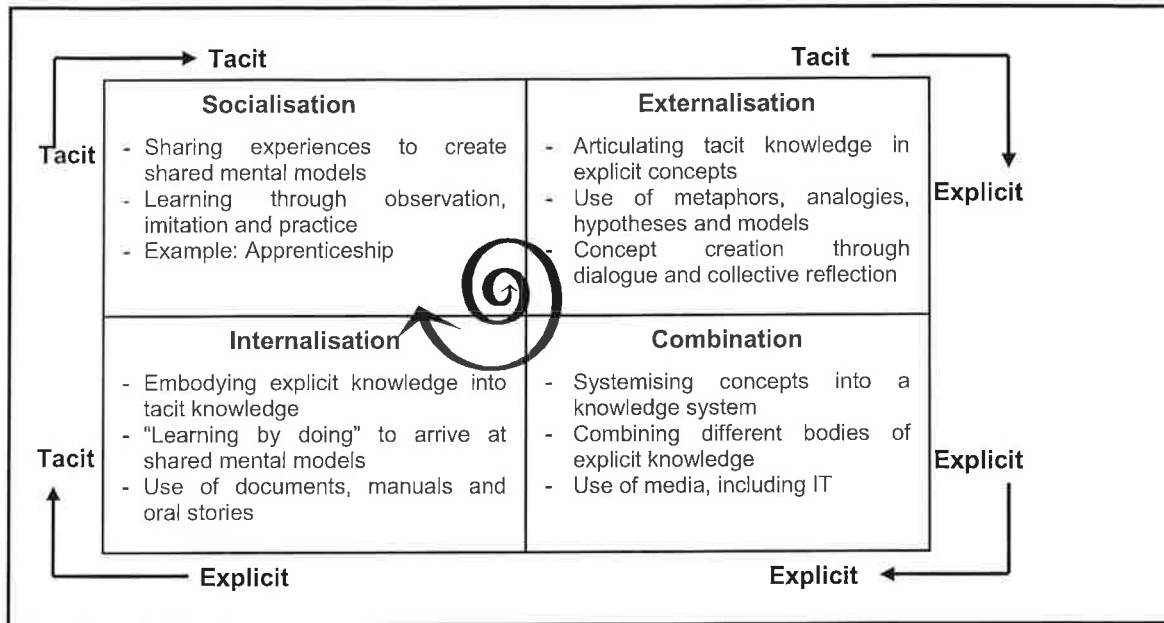
Table 2 shows how different innovations or technologies contain different proportions of each type of knowledge. Knowledge can be mostly embedded in technologies (purification tablets, pumps) and routines and systems (water rights and water management systems), or mostly encultured in social systems and values (customary water rights). While one can argue about the exact proportions of each knowledge type, it is obvious that a product innovation such as improved water purification has less encultured and embodied elements than a process innovation, such as community water rights.

In practice this means that knowledge sharing and learning needs to be adapted to the types of knowledge involved. Encultured knowledge cannot be expressed in a mathematical equation, but might well be shared through stories or songs. Knowledge embedded in technologies is shared by using the technology – and “learning-by-doing” about its shortcomings (e.g. how best to repair a hand pump, using locally available tools).

Knowledge conversion as a way to sharing tacit knowledge

Theorists have been arguing for some time whether or not tacit knowledge, such as knowledge embedded in technologies or encultured in values, customs and traditions can be “converted” into explicit knowledge. At the forefront of this debate is the SECI model of knowledge conversion, developed by Nonaka and Takeuchi (1995). It postulates a four-stage process through which tacit knowledge of individuals is shared with others through socialisation, then converted into explicit knowledge through externalisation, combined with other sources of explicit knowledge, and then re-converted into collective tacit knowledge through a process of internalisation. This cycle continues *ad infinitum* and generates new knowledge all the time.

Figure 2: the SECI process of knowledge conversion (Source: after Nonaka and Takeuchi (1995))



Stories play an important role in the conversion process. They are powerful tools for capturing aspects of tacit knowledge that cannot otherwise be codified. Many cultures in South Asia and Sub-Saharan Africa rely on stories to convey meaning, values, and lessons learnt from the past. They are now being "re-discovered" by knowledge management gurus (see for example http://www.sethkan.com/Resources_0FuelYourImagination.html) and are even supported by ICT (Information and Communication Technologies) – see for example <http://www.noweco.com/press011218.htm>. However, can all individual tacit knowledge be converted into shared explicit knowledge, or are the four different forms of knowledge (individual and collective tacit and explicit knowledge) essentially different and separate? And what does it mean to have or "own" knowledge, of whatever description?

Figure 3: Different types of organisational knowledge

	Tacit	Explicit
Individual		
Collective		

Source: Cook and Brown 1999

Knowledge as an asset versus knowledge in action

The SECI model has been criticised for assuming that all individual tacit knowledge can be codified and converted into explicit knowledge. Cook and Brown (1999) argue that tacit and explicit knowledge of individuals and groups are essentially four different types of knowledge and one cannot be converted into the other. Perhaps more importantly, they focus on knowing as a process that generates knowledge, rather than knowledge as something that one possesses.

The distinction appears artificial, but an example can help to better understand it. Imagine a farmer ploughing his field. He has the knowledge (both tacit and explicit) of how to plough a field, even when he is not ploughing. But it is only in the act of doing it (applying the knowledge, "knowing") that this knowledge has meaning. Ploughing might require a lot of different types of knowledge, for example

deciding whether the weather is right, training the oxen, how to obtain implements and draft animals from a neighbour using social capital, etc. Knowing in action is bridging the divide between the four knowledge types shown above. The process by which different knowledge types are used in practice is described by Cook and Brown as a 'generative dance'. According to this metaphor, the organizational processes that generate knowledge do not depend simply on an inventory of static knowledge tools, but on an ability to use those tools. Thus the active knowing implied by practice is central to the processes by which new knowledge is generated.

The role of learning alliances and communities of practice in sharing tacit knowledge

Realising the importance of learning and knowledge generation through *practice*, a range of organisational and institutional arrangements to facilitate such joint learning have emerged. Communities of practice (CoP), as their name suggests, have been defined by Wenger (1998) as informal social networks in which the engagement of individuals in a joint enterprise is facilitated by a shared repertoire of concepts, actions, tools, stories, artefacts and discourse. This self-perpetuating group differs from other teams and networks in that, although there is a diversity of experience and background, all members, through extensive communication and shared practice over a period of time, have come to share similar goals and interests, beliefs and value systems without any formal organization. Wenger and Snyder (2000) differentiate between CoPs, formal workgroups, project teams and informal networks. In each of the latter cases the groups are brought together to work on specific projects or problems. CoPs differ from the other groups in that they are informally bound.

The knowledge created and shared by a CoP differentiates it from other forms of group practice. CoPs enable expertise to be shared and best practice to emerge, freely and informally. The commitment to the CoP overrides any reluctance to share knowledge and, as it is cultivated, the community accepts the boundaries within which its knowledge-sharing activities fall. It is this trust among the community members that demonstrates the uniqueness of CoPs and their ability to go beyond team and networking practices.

Wenger (2000) emphasizes that it is the members who determine the competence required to participate fully in any CoP. This is done through a combination of three key elements:

- Joint enterprise: collectively developed understanding of what the CoP is about.
- Mutuality: mutual engagement and reciprocity.
- Shared repertoire: communal resources – language, routines, sensibilities, artifacts, tools, stories, styles, etc. and their appropriate use.

CoPs enable learning to take place through shared experience, thus creating knowledge that is socially held. A CoP grows 'out of the convergent interplay of competence and experience that involves mutual engagement' (Wenger, 2000, p. 229). All members of a CoP have different knowledge and expertise: each person is knowledgeable about their own sphere of existing expertise and at the same time inexperienced (or novice) about others' areas. A vital role of the CoP is to provide a support structure between members. Such practice draws on individuals at all levels and allows reciprocity as new problems and issues emerge. It enables people to sound out new ideas or new concepts before putting them into practice in the workplace or other environment. This sounding out is crucial to drawing on the experience and expertise of the members of the community, and learning from other people's mistakes what works and what doesn't. CoPs enable problems to be solved more quickly by drawing on the wide range of expertise within the community, and help to develop and transfer best practice. This expertise also acts to develop professional skills for those less experienced (Wenger and Snyder, 2000).

Nevertheless, communities of practice also have disadvantages. The background paper for the IRC symposium (Moriarty et al.) points out that CoPs tend to be composed of *peers* – people from similar backgrounds who support each other in the learning process. If that is the case, learning opportunities are lost, because it is through diversity of experiences and outlooks that most learning takes place. Nonaka and Takeuchi (1995) stress the importance of 'requisite variety' in organisations, a feature that

facilitates effective knowledge creation and utilization. This proposition stems from the idea that an organisation's internal diversity must be able to at least reflect the complexity it faces in the external environment. Most development problems are extremely complex and therefore require a variety of ideas, approaches and experiences to address specifically. However, CoPs can well be diverse and cut across different roles and backgrounds, similarly to Learning Alliances (LAs). In practice it depends on the aims and commitment of the initiators and members of CoPs and LAs how they attract, motivate and retain members from a range of cultural and professional backgrounds.

Learning alliances explicitly aim at connecting platforms of stakeholders from a range of organisational backgrounds. Therefore they provide more opportunities to achieve the desired "requisite variety". However, the differences in experiences, priorities, access to resources (e.g. ICT equipment etc.) is also a disadvantage that can result in high transaction costs.

Both CoPs and LAs appear to be suitable mechanisms for sharing explicit knowledge, but how effective are they really in sharing tacit knowledge? Going back to the ideas of Cook and Brown, can one know without knowing? If we accept the notion that "knowing" involves practice, then at least some knowledge can only be shared through practice – by doing things together. CoPs and LAs can well provide opportunities for joint action; however, because of their size and organisational constraints it will rarely be possible to undertake action research involving all members of a LA. Therefore, action research projects can be a useful component of LAs by providing the practical experiences that are required to generate and share contextual knowledge in small groups of diverse stakeholders, cutting across the platforms of the LAs.

The role of projects in developing and sharing tacit knowledge

Research and development projects have been the conventional organisational approach to generate new knowledge in agricultural and rural development, and to speed up technology transfer. The shift has been from single-agency, single-discipline projects towards coalitions (see e.g. <http://www.cphp.uk.com/aboutcphp/default.asp?step=4&pid=24>) made up of diverse partners from different disciplinary and organisational backgrounds. Projects have a number of advantages, as compared to CoP and LAs, but also some disadvantages. While projects can generate and share knowledge quickly between a small group of project partners, the learning is often not scaled up at all levels. Academic papers coming out of research projects are addressed at the minority of stakeholders who have access to them. The limited time frame and donor expectations impose rigid boundaries to projects, and interesting new insights can often not be developed further.

However, the main strength of projects lies in the intensive interaction between partners working towards a common purpose. As a result, projects sometimes form the starting point for wider groupings of stakeholders, who can choose to seek funding for future collaboration and exchanges.

Table 3 summarises how various organisational arrangements address different types of knowledge in different ways. Each arrangement has particular strengths – calling for institutional pluralism. However, the boundaries between the organisational forms are blurring, e.g. with increasing numbers of projects use media other than documents to capture knowledge. Similarly, members of CoPs might well engage in action research to generate new knowledge related to the community's purpose.

Table 3: Institutional mechanisms and knowledge types

Transfer / development of knowledge types	Project	CoP	LA
Embrained	Like 'problem-ed'	Like-minded	Unlike-minded and 'problem-ed'
Embodied	Action research	Purpose	Action research
Embedded	To develop	To share	To discover and scale up
Encoded	(Project) Documents	Information base	Information base
Encultured	Given	Personal drive	(re)Created

Source: Pels 2005

The following sections give two examples of projects that have led to the sharing and creation of knowledge between a wider range of stakeholders through new organisational arrangements that could be labelled CoPs or LAs.

Managing Common Pool Resources (CPRs) in India

A multi-stakeholder research project entitled "Common pool resources in semi-arid India - dynamics, management and livelihood contributions" was implemented with funding from the Natural Resources Systems Programme (NRSP) of DFID (see <http://www.nrsp.org/>) in 2001. The project involved research institutes, NGOs and community based organisations in an attempt to share and document lessons learnt from CPR management in India. The reports from this project can be downloaded at <http://www.nri.org/IndianCPRs/homepage.html>.

The project was short (nine months) and had very limited resources – as a result, a large proportion of the knowledge compiled originated from secondary sources, such as project reports and publications (see Osman et al. 2001). However, two more detailed studies were undertaken for the states of Gujarat (Gupta 2001) and Andhra Pradesh (Anwar 2001), which used case studies of CPR management initiatives in order to identify best practices. Interviews with key informants involved in the initiatives were used to extract tacit knowledge about success factors and contextual parameters.

In CPR management, tacit knowledge is particularly important. Not only need the agreements and regulations be grounded in local context, but their enforcement requires substantial communication and negotiation skills that emerge only from experience and interactions with a wide range of stakeholders. Encultured knowledge is essential in order to successfully balance the interests of local leaders and diverse social groups.

While the project suffered from the usual shortcomings of many research projects (short time scale, limited budget, and difficulties in overcoming organisational boundaries), it raised interest in and awareness about CPR issues, which lead to a number of follow-up initiatives in India. Some of the partnerships developed during the project continued beyond its lifespan and were absorbed by other networks and groups, such as WASSAN (the Watershed Support Services and Activities Network – see <http://www.wassan.org/>). WASSAN started in 1995 as an informal network of NGOs to influence the Watershed Development Programme of Government of India, but developed into a formal organisation, but registered as an independent Public Trust in December 1999 and is now functioning as a professional support organisation.

The relationships and knowledge developed in a small research project thus feeds into existing networks and communities of practice. With trust being an important component of any collective activity, projects can play a vital role in building relationships, sensitising stakeholders and share knowledge that can then feed into other organisational forms, including LAs.

The Kavango Livestock Interest Group in Namibia

KFSRE (Kavango Farming Systems Research and Extension), a DFID-funded (UK Department for International Development) development project was implemented in Kavango region of Northern Namibia from 1994 to 2000. The project assisted the Namibian Ministry of Agriculture, Water and Forestry (MAWAF) in testing and implementing a livelihoods-focused farming systems approach. The project soon worked with a wide range of stakeholders in the region, and shared knowledge through on-the-job training of ministry staff, publications and conferences, and the institutionalisation of a number of farmer participatory research methods and techniques.

Realising the need to address livestock issues in an integrated way motivated one of the project staff to initiate the Kavango Livestock Interest Group (KLIG) as a forum for stakeholders with interests in livestock issues. It brought together government department staff, community leaders, NGOs, and representatives from projects and the private sector to address constraints to livestock production and marketing in the region. Again, when the project ended, KLIG continued, building on the social capital developed earlier.

KLIG remains an informal network, but has successfully tapped into resources from donor-funded projects. It identified a number of key constraints to livestock enterprises in the district and lobbies on behalf of livestock keepers. The group has ensured that the perceptions of the different stakeholders are understood and their knowledge is appreciated. It also acts as a coordinating body for all livestock-related interventions in the region.

Conclusions

The examples show that research and development projects can provide a useful starting point for LAs and CoPs, because they are able bring together a range of stakeholders from different organisations for joint learning. Different people have different strengths in relation to the learning cycle, and therefore group activities benefit from the inclusion of diverse types of learners.

This is particularly useful when problems are complex and perceived differently by different stakeholders. Such problems require sharing of tacit knowledge and an understanding of the context of the problem. An emphatic approach as postulated by constructivism acknowledges the differences in perception of all involved in order to enable the development of a shared understanding.

Being involved in joint activities with a common purpose can result in substantial organisational learning. Learning through action is essential in order to transfer and share tacit knowledge. Some authors argue that tacit knowledge can be converted into explicit knowledge. However, the author believes that some forms of tacit knowledge can only be shared through a process of “knowing”, which uses and applies knowledge in order to generate new knowledge continuously.

Research projects can provide useful platforms for action research. While project budgets, logframes and milestones put a straightjacket on creative activities, other organisational forms can be initiated by and grow with support of projects, until they develop a life of their own.

It might well be useful to measure a project’s success partly by the networks it creates and supports, and their longevity beyond the project duration.

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