

Environmental Capacity building through Knowledge

Transfer Partnerships

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Abstract

This paper describes the need for organisations to develop adaptive capacity in the face of environmental challenges. It argues that 'knowledge transfer' can provide a useful mechanism for developing this environmental adaptive capacity and outlines the experiences of a Knowledge Transfer Partnership between North Tyneside Council and Northumbria University. Initial findings from the partnership suggest that the knowledge and skills transferred to the local authority through knowledge transfer, are already building capacity within the organisation, and beginning to filter down to private sector companies involved with the authority and the communities who they represent.

Keywords

Knowledge Transfer; Adaptive Capacity; Environment; Climate Change; Organisational Learning

Introduction

Public and private sector organisations are finding themselves increasingly tasked with dealing with environmental and economic issues which present a threat to their operations and existence. Most notable are the threats posed by fossil fuel resource depletion, security of energy supply and global climate change. In addition to this, public sector organisations, in particular local authorities, are challenged by the need to providing high quality infrastructure and services such as social housing, whilst building resilient communities that are able to adapt and respond to these threats. The challenge for many organisations, particularly local authorities is that they often do not possess the internal skills and knowledge to develop the tools or methods required to respond to these challenges. One solution is to use external consultancies to fill this knowledge gap and develop responses and strategies. With this approach much of the skills, knowledge and learning remain with the consultant. As a response to this, many organisations are choosing an alternative pathway, the Knowledge Transfer Partnership (KTP).

The aim of a KTP is to transfer specialist knowledge from within an academic institution into a private or public sector organisation. The advantage is that once the KTP ends, the knowledge, skills and capacity built up during the partnership will remain within the organisation rather than leave with external consultants. This in itself strengthens the process of building resilience to environmental problems within an organisation and subsequently the wider community.

This paper will provide an insight into how knowledge transfer can be used to build skills and knowledge in a public sector organisation as a means to provide internal capacity to cope with environmental issues. It draws on the experiences of a KTP between Northumbria University and North Tyneside Council. The aim of the KTP is to build capacity and knowledge in the local authority with regard to specifying and operating low carbon renewable energy technologies. It is envisaged that this knowledge and capacity will disseminate through the local authority, in particular its planning regime, which through its advisory role can encourage greater take-up of decentralised

renewable energy systems by private developers, community groups and home-owners. The project utilises the principles of capacity building, social learning and user/stakeholder interaction, as a means to embed resilience in both energy systems and the community as a vehicle to reduce vulnerability. It is also hoped that the project will encourage local suppliers and installers to develop skills in this growing sector, hence increasing economic and sustainable development.

Need for capacity building

Organisations are increasingly faced with dealing with environmental and economic issues and for many, this is resulting in a steep learning curve as they try to get to grips with the nature of the problems, before being able to plan to mitigate problems and adapt to changing markets. The main threats which organisations are facing stem from the issues of resource depletion (peak oil), energy security and global climate change.

Resource depletion is possibly best demonstrated by the notion of 'peak oil', a phrase used to describe the situation when global oil production reaches a peak, following which oil supplies decrease until exhausted. Many predict that this peak has already occurred or will have occurred by the year 2015 (Hirsch, 2008; Bentley, 2002; Heinberg, 2007) . Meanwhile, demand for oil continues to increase. The same is true for other fossil fuels such as coal and gas with estimates placing peak coal to occur at around 2025 (Zittel & Schindler, 2007; Mohr & Evans, 2009), and peak gas at around 2020 (Bentley, 2002).

For many organisations, the notion of peak oil (or peak gas and coal) is misunderstood, if understood at all. For many it is unthinkable that there may come a time when the fuel which provides the energy which business need to operate on a day to day basis as well as fuel the transport system required to distribute raw materials and goods, many of which are also derived from fossil resources such as oil. Because of the energy required to produce any good or service, we need energy prices to remain low in order for all other prices to remain low. With oil depletion, energy prices will rise as

supply fails to keep up with demand. Organisations are now finding that they need to understand the problem before they can develop strategies to adapt and change to the threat posed by resource depletion.

As global resources diminish, there is increasing concern over the security of the UK's energy supply (DTI, 2003; DTI, 2006; Winstone et al., 2007). The decline of fossil fuel reserves such as those in the North Sea, and the fact that the UK's current nuclear power stations are approaching the end of their lives and are due to close, has meant that the UK has become a net importer of natural gas, and increasingly reliant on imports of other fuels such as coal from Poland (DTI, 2006; Banfill & Peacock, 2007). These imports often come from regions affected by political instability such as the Middle East, or countries such as Russia who may wish to use their resources as a bargaining tool for furthering their own political interests (Bentley, 2002; Turton & Barreto, 2006; Helweg-Larsen et al., 2007; Winstone et al., 2007).

Perhaps better understood by organisations are the threats posed by global climate change. The overwhelming majority of scientific opinion now recognises that the Earth's climate is changing, due in large part to emissions of greenhouse gases (GHGs) from anthropogenic activities such as the production of energy from fossil fuels (DTI, 2006; Stern et al., 2006; McCarthy, 2001; Solomon et al., 2008).

The impacts of climate change are likely to be substantial, posing a serious threat to human society and the natural environment (Solomon et al., 2008; Stern et al., 2006). The effects of climate change can already be seen, for example, increases in severe weather events such as hurricanes, heat waves, extreme precipitation or snow fall. These events present serious problems to organisations whose operations are affected by not being able to transport goods or run services, or from increased sickness in employees working in extreme cold or hot conditions, and damage to infrastructure or assets such as buildings. Building adaptive environmental capacity, or more specifically the capacity of individuals, public and private sector organisations and nation states to

respond and to reduce their vulnerability to climate change, is acknowledged as a central element in climate change adaptation (Solomon et al., 2008).

The challenge for both private and public sector organisations is how to respond to these multiple challenges. For private sector companies, the main driver is often the need to continue to be financially viable. For public sector organisations, in particular local authorities developing and building resilient energy systems which can aid in the development of low carbon communities is key. Social care targets, such as reducing the number of elderly people vulnerable to fuel poverty and extreme weather events such as heat waves, have long been a responsibility of local authorities. More recently meeting climate targets has become an important function of local authorities as set out in the 2006 Climate Change Programme. From April 2009 local authorities' success in cutting carbon dioxide emissions will be measured as part of a new performance framework. They will also be assessed on their efforts to adapt to the effects of climate change, and to tackle fuel poverty. Many Council's are expected to set specific targets to lead the drive to cut back on carbon emissions in their areas, however some have struggled due to a lack of knowledge, capacity and understanding within the organization with regard to environmental issues.

In the face of these challenges and threats there is a clear need for both private and public sector organisations to build internal knowledge and the capacity to adapt and change to meet these challenges. By doing so organisations are less vulnerable to shocks, can gain competitive advantage (Jon Hanssen-Bauer & Snow, 1996; Oliver, 1997) and in the case of public sector organisations, better serve the communities within which they operate. The question for organisations is *how* they build internal capacity.

Building environmental capacity

Traditionally there are many ways in which knowledge which is lacking within an organisation can be attained, such as creating new job roles, staff training and development or using external consultants. However it is debatable as to whether any of these approaches really deals with the real issue of how to develop skills, knowledge and capacity which can be integrated throughout the organisation, rather than as an add-on. Environmental adaptive capacity can be created in a number of ways; investing in the production of information and knowledge; increasing financial resources in areas where they are currently lacking and encouraging change within institutions permitting learning to be incorporated as a core value (Janssen & Ostrom, 2006).

Investing in the production of information and knowledge can be achieved by creating new job roles and investing in additional staff with the skills and knowledge required to enhance capacity to cope with environmental issues. This approach can prove costly to organisations that need to fund the recruitment, salary and on costs of new staff members, particularly at a time of recession where companies are looking to reduce staffing levels. Another method is to buy in short term knowledge when an organisation does not have the internal capacity to undertake work in a particular area from external consultancies. Consultants, used correctly and in appropriate circumstances can provide substantial benefits to organisations. However used incorrectly, consultants can drain budgets rapidly with no real productive results (National Audit Office, 2006) and the quality of consultant advice can vary greatly within and between consultancy firms. The main problem with this approach is however that the knowledge and expertise usually leaves with the consultant.

Environmental capacity can also be created by increasing financial resources in areas which are lacking. For private sector organisations this could mean investing in alternative transportation or manufacturing infrastructure which does not rely on fossil fuel sources of energy, or putting money into new products that capitalise on opportunities brought about by global environmental issues in an attempt to secure the 'green pound'. For the public sector organisation this could mean investing

in initiatives such as small scale renewable energy or recycling programmes designed to enhance the adaptive capacity of communities. However this approach, whilst having merit, assumes that finance is available, and can be in danger of externalising environmental issues and placing the responsibility away from the organisations core operations.

In the case of long term issues such as resource depletion, energy security and climate change and other environmental threats, it is perhaps better to ensure that the knowledge and skills required are an integral part of the organisational culture, and that learning is incorporated as a core value. This can be achieved by investing in staff training and development, however this again requires often substantial financial investment and it can be difficult to engage all staff members full in a programme of training. Changing organisational culture in itself can be an extremely difficult task and usually relies on those at the top of the organisation being informed, willing and able to support and communicate change.

Another, perhaps more informal method through which knowledge is created and transferred is the communities of practice approach (Brown & Duguid, 1991; Lave & Etienne Wenger, 1991). Communities of practice are groups of people who are informally bound together by shared expertise and passion for a particular enterprise (E. C Wenger & Snyder, 2000). People engaged in communities of practice often share their knowledge and experiences in a free-flowing, creative manner which can foster new approaches to problems (E. C Wenger & Snyder, 2000). However, communities of practice are built on mutual trust and understanding which can take time to foster (Roberts, 2006). They can also be difficult for organisations to manage, or integrate within the business as the organic, spontaneous and informal nature communities of practice can make them resistant to supervision (E. C Wenger & Snyder, 2000).

One method which can go some way to satisfy these multiple adaptation pathways and assist organisations in developing the capacity to respond to environmental challenges by combining some of the best aspects of the methods previously described, is the Knowledge Transfer Partnership.

Knowledge Transfer Partnerships

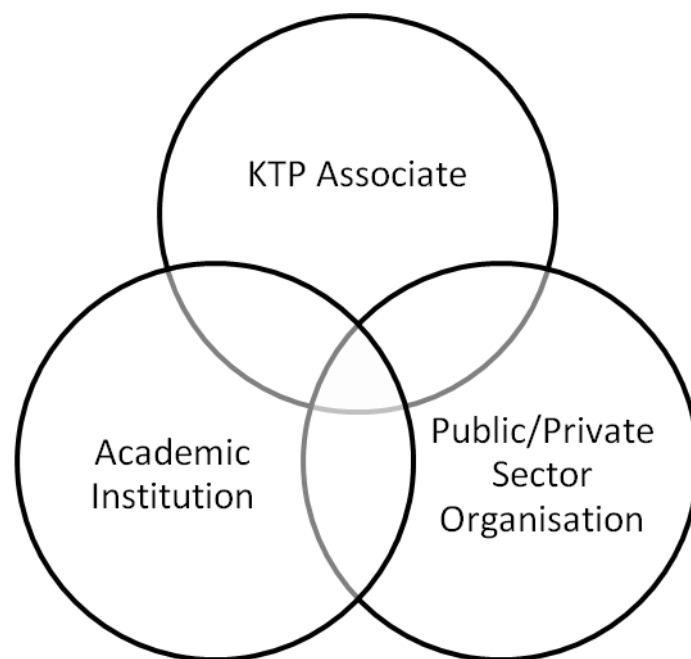
Recently there has been a move towards the notion of 'knowledge transfer' from universities to industry in order to secure economic benefits (Davies, 2009). Increasingly 'knowledge transfer' is being used to transfer knowledge from universities to public sector organisations such as local authorities in order to secure social as well as economic benefits. However, this knowledge transfer may be more appropriately termed 'knowledge exchange' (Davies, 2009) as the relationship is a two way one where knowledge, capacity and skills flow not only from the academic institution to the industry partner, but also back from the partner to the academic organisation. The role of knowledge transfer is recognised by the Government in a recent report from the Council for Industry and Higher Education (Connor & Hirsh, 2008) which indicated that universities will be pushed to develop relationships with public and private organisations to improve the transfer of research knowledge and innovation into the commercial world and local government.

The KTP is a government funded scheme, administered by the programme management company Momena, which involves a high calibre graduate (KTP Associate) working within an organisation with the backing and supervision of an academic institution (Momena, 2009). The result is strategic advantages for the organisation, academic outputs for the University, and valuable training and industry experience to the Associate. The aim of a KTP is to transfer specialist knowledge from within an academic institution into a private or public sector organisation (Momena, 2009). Such knowledge generation and focus on learning has now become a central issue in environmental capacity building and adaptation (Berkes 2009).

The advantage that a KTP has over the more traditional knowledge generation routes previously described is that through the Associate, organisation can draw upon the often substantial knowledge skills and resources of the University. Also, once the KTP ends, the knowledge, skills and capacity built up during the partnership will remain within the organisation rather than leave with external consultants. This in itself strengthens the process of building resilience to environmental problems

within an organisation and subsequently the wider community. There is also the advantage that by having an Associate embedded in the organisation, they act as a conduit to other staff who learn about the Associates particular interest and field simply through office chat and observing their work.

Figure 1. The structure of a Knowledge Transfer Partnership



There are, of course, disadvantages to using KTP as a means to transfer knowledge into an organisation, in particular a public sector organisation. One of the primary focuses of KTP is to create financial benefits to the host organisation. This focus has led the language and structure of the partnership to be geared to profitmaking business, an approach which does not necessarily lend itself to public sector organisations (McEwen, 2007). This can make measuring the success of the KTP more difficult. Another disadvantage is that a KTP is only funded for a limited period of time and thus if a project runs over schedule for whatever reason, the company either has to fund the extension internally, or terminate the partnership and accept that not all expected outcomes will be met (McEwen, 2007). There can also be problems for the associate, who receives supervision and

support from a representative of both the academic knowledge base, and the host company, if both partners have conflicting priorities.

Adaptive capacity is something that organisations need to peruse in an ongoing manner through measures that embed the principles of adaptive capacity inextricably in the organisations culture (Sussman, 2004). The links which can be established through the KTP can be nurtured and retained well beyond the lifetime of a specific project enhancing knowledge, learning and capacity throughout both the academic institution and the public/private sector host organisation.

The next section of this paper describes the experiences of a Knowledge Transfer Partnership between North Tyneside Council and Northumbria University designed to develop capacity and knowledge in the local authority with regard to specifying and operating low carbon renewable energy technologies

North Tyneside KTP

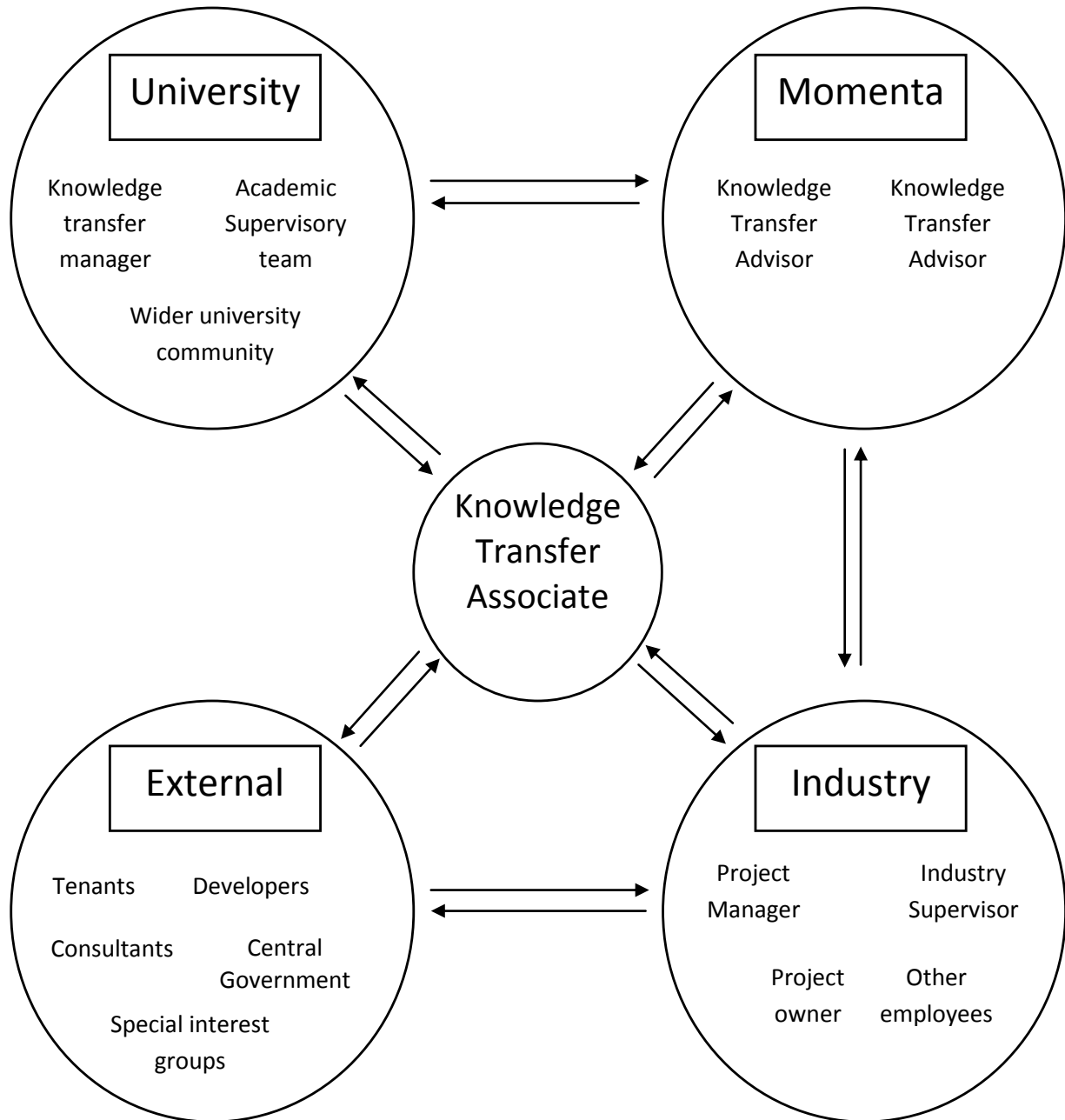
North Tyneside is a metropolitan borough of Tyne and Wear in the North East of England. The council provides a wide range of services, with its Community Services Directorate responsible for provision and maintenance of 15,720 homes with an asset value of approximately £14 billion. One of the key challenges for the local authority is how to build sustainable social housing which can reduce the vulnerability of user groups at risk from multiple environmental shocks. The council, faced with the problem of how to replace its ageing sheltered accommodation, made the strategic decision to bid for central government PFI funding. The authority was successful in its bid and was awarded just over £112M to contribute to the procurement of high quality, sustainable homes. The project, titled Older People: Homes for the Future, is aimed at refurbishing and rebuilding all sheltered housing in the borough. In doing the project so aims to reduce overall energy use, reduce greenhouse gas emissions and maximise potential for renewable energy in line with climate change goals and renewable energy targets set out by central government and the local authority's policies.

The project also aims to meet the Social Care targets of the authority by reducing the number of elderly people vulnerable to fuel poverty and extreme weather events such as heat waves and increasingly cold winters.

Early on in the project, the authority recognised that it lacked the knowledge, expertise and experience in renewable energy systems and sustainable building and rather than follow the conventional route of using external consultants to fill the knowledge gap, the project team initiated a Knowledge Transfer Partnership (KTP) with Northumbria University. The aim of the KTP is to build capacity and knowledge in the local authority with regard to specifying and operating low carbon renewable energy technologies. It is envisaged that this knowledge and capacity will disseminate through the local authority, in particular its planning regime which through its advisory role can encourage greater take-up of decentralised renewable energy systems by private developers and home-owners. There is also the hope that the project will encourage local suppliers and installers to develop skills in this growing sector, hence increasing economic and sustainable development.

The structure of the North Tyneside Council KTP is shown in Figure 2. The KTP Associate is embedded in the council working with the project team on a full time basis and acts as the conduit for knowledge transfer between all of the project stakeholders. The Associate can transfer knowledge on best practice and strategies for designing and implementing environmental strategies directly into the Council and the project team .on a day to day basis, whilst examining academic issues in the context of a real life situation thus contributing to the Universities research output and producing case studies to enhance teaching.

Figure 2. The structure of the North Tyneside Council/Northumbria University KTP showing the direction and scope of information flow



Initial findings suggest that by enhancing the knowledge of the project team members about environmental issues such as resource depletion, energy security and climate change, sustainable building and renewable energy and by embedding tools and methods for specifying low carbon energy systems and evaluating the sustainability of plans and designs, developers bidding for the PFI contract have begun to focus on innovative approaches to energy system development which they were initially reluctant to embrace. The enhanced capacity of the project team has facilitated the ability to explain the rationale behind the local authority's decision to promote decentralised low and zero carbon renewable sources of energy.

The nature of the project has meant that the KTP has spread throughout many areas of the council and seen the associate working with other departments such as development control, regeneration, the sustainable development team and those dealing with the procurement of new schools. In addition to embedding knowledge of sustainable energy systems, the associate is now providing the council with the skills and methods it requires to develop sustainable planning policy and meet its overall carbon reduction commitments. This experience has demonstrated how the KTP initially designed to build capacity in a particular area and department has filtered through to other areas of the organisation. The knowledge exchange has also offered the developers a chance to gain expertise in specifying and operating such technologies and therefore gain commercial advantage and begin the process of developing environmental capacity within their own businesses.

The process of developing adaptive capacity in the sheltered housing tenants has also been enhanced. The council has engaged fully with existing tenants, as well as potential future tenants, through a series of focus groups which the developers also have the opportunity to participate in. Many have been surprised at the level of understanding and engagement in the issue of sustainable energy provision from an elderly user group, many of whom are subject to the very vulnerabilities discussed previously such as fuel poverty and the risks associated with disruption of supply. This understanding has come as a surprise to many prospective developers who after finding they had an

engaged and empowered user group on their hands had found it necessary to raise their game with regard to plans for sustainability in the project.

The work will continue to explore how knowledge transfer can increase environmental adaptive capacity focusing on how the local authority's ability to plan for and react to environmental challenges has changed. The way in which new and refurbished buildings and technologies are used by residents and how they adapt to the presence of such technologies will also be explored to ascertain how the transfer of knowledge can trickle down to local residents allowing them to build the capacity to reduce vulnerability to environmental shocks and move towards becoming a low carbon community.

Conclusion

It is clear that in the face of pressing environmental issues such as resource depletion, energy security and climate change, that there is a need for organisations to develop the capacity to adapt to meet environmental challenges. This paper proposes that the Knowledge Transfer Partnership is one way in which environmental capacity can be built into an organisation and is perhaps better placed to do so than other, more traditional methods such as the use of external consultants, staff recruitment and short term training and development plans.

The case of a KTP between North Tyneside Council and Northumbria University designed to develop capacity and knowledge in the local authority with regard to specifying and operating low carbon renewable energy technologies has been examined. The initial results from the partnership have demonstrated that it has already begun the process of building environmental capacity within the project team and wider Council. The project team has been able to better communicate its needs to the consortia bidding for the PFI contract, and in response to engaging with a knowledgeable and involved user group, developers have significantly raised their game with respect to specifying sustainable technologies and design.

For the Council, the decision to go down the KTP route rather than the conventional approach of using external consultants has meant that the knowledge, skills and capacity built up during the project will remain within the local authority rather than leave with external consultants. As a result of the positive experience so far, the Council has decided to initiate a number of similar partnerships in other areas in an attempt to build capacity within departments not directly related to this KTP. The acknowledgement by the Local Authority that developing knowledge, skills and understanding by partnering with an academic institution with recognised expertise in a particular area demonstrates in itself that the organisational culture is developing to incorporate learning as a core value

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