Action Learning: co-creating value from collaborative sustainable projects

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Hertfordshire Business School employs approximately 200 academic staff in a state-of-the-art environment located in Hatfield Business Park. It offers 17 undergraduate degree programmes and 21 postgraduate programmes; there are about 75 research students working at doctoral level. The University of Hertfordshire is the UK's leading business-facing university and an exemplar in the sector. It is one of the region's largest employers with over 2,600 staff and a turnover of almost £235 million. It ranks in the top 4% of all universities in the world according to the Times Higher Education World Rankings and is also one of the top 100 universities in the world under 50 years old. In the last UK Research Assessment Exercise it was given the highest rank for research quality among the post-1992 universities.

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Abstract

This article reports on the specific role that action learning plays in the promotion of sustainability and innovation in the Local Government sector. The study focuses on one organisation and the efforts of a senior manager to enact change. The senior manager utilized his participation in an MBA programme to bring the classroom learning into his business. As a consequence of the requirements of the programme and also the desire of the senior manager, he was able to instigate a change programme, which delivered measurable outcomes and had financial and cultural impact.

This case study illustrates the favourable advantages of using action learning as an intervention approach by HEI's in driving sustainable innovation in the Local Government sector.

Introduction

The graduate market is both challenging and competitive; successful graduates are those that have both work experience and employability skills. This is equally as relevant to those graduates in mid-career positions, who come back to university to undertake a higher degree. Business schools have long experimented with embedding case studies and live projects into their curricula, however the value to the participating enterprises is often not measured or is difficult to measure. This paper presents an insight into the improved value received when Work-Based Learning (WBL) is a core deliverable to the students, middle to senior-managers, and to the participating enterprises. The collaborative nature of the projects undertaken improves the skills and competences of the students, and facilitates onsite work training to the employees at the enterprise. The projects on the course particularly focus on sustainability initiatives at the enterprise and include the difficult issue of management mindset and organizational culture change. Hawken's acknowledged the difficulty back in the 90's regarding moving enterprises' mindset away from pollution prevention towards more comprehensive issues of sustainable developments (Hawken 1995).

The focus of this study is on the co-creational value of collaborative projects (Makelin and Reuhkala 2012), where students 'learn from work' (ABL) and 'learn at work' (WBL), and business managers learn and benefit from: work training for their employees, an implementable new or modified business process or system, and the overall value of collaborating, accessing new knowledge and expertise, with a business school. A single exemplar case study is used to detail the process, multiple learning outcomes and business impact of combining ABL and WBL provision within the one course on the Hertfordshire Business School MBA programme.

The Context

UK Government policy surrounding economic development and steady transition to a low-carbon economy has identified the need to enhance professional and management learning. The Leitch Review in 2006 extolled the value of co-financed Work-based Learning (WBL) within student programmes (Leitch 2006). The Sainsbury Review in 2007, and the later Wilson review in 2012, both stressed the importance of employer engagement as central to healthier collaboration between the Higher Educational Institutes (HEIs) and the business community (Wilson 2012). Hence the current interest of government and individual HE's in extending their collaboration and business engagement activities.

HEIs significantly contribute both to economic development and growth within their local, regional and national communities through the provision of skilled, competent and knowledgeable graduates and further training for mid-career managers. Recent figures for the impact of the Higher education sector on UK economy is put at £69 billion(Witty 2013). Whilst being mindful of facilitating the delivery of skilled and competent graduates and postgraduates, HEIs need also to expose themselves to subject-specific learning that balances technical and business knowledge with practice-based learning (Hynes, Costin et al. 2010), linking with the recommendations from both the Sainsbury and Wilson Reviews. Recent studies on business schools have questioned the impact that management programmes have on their graduates, and on the overall 'profession of management' across all sectors (Pfeffer and Fong 2002; Starkey and Tempest 2005).

This paper highlights the supporting literature associated with sustainable innovation, and general opportunities that WBL 'Learning at Work' and specifically ABL 'Learning from Work' has for professional management development. Thus justifying the choice of a single case study to illustrate the challenges faced by one particular public service organization in initiating sustainable initiatives. WBL is an acknowledged key objective of the UK government's policies concerning improving employees skills, through continuing professional development and equally favoured by professional bodies and employers alike (Dearing 1997; Gray 2001). Taking mid-career managers out of their work and exposing them to new theories and practices offers a new perspective of 'Learning from Work' (Leitch 2006). ABL embodies 'people working and learning together by tackling real issues and reflecting on their actions' and then applying this into the workplace environment (McNiff and Whitehead 2011). ABL is therefore closely related to co-operative inquiry in which individuals work together in groups and are co-researchers – one particular strand of this is action inquiry or action learning (Reason 1994, Reason and Bradbury 2008). Action learning has been used extensively in the health care sector because of its enhanced collaborative and peer learning activities (Congdon and Congdon 2011). It follows that WBL helps articulate their action learning from the classroom (theories and taught practices) to the workplace environment, bringing new insights and understanding (Voorhees and Harvey 2005, Blake and Worsdale 2009). The main differences then between action-based learning (ABL) and work-based learning (WBL), is ABL focuses on 'learning by doing' where they apply classroom theory and taught practices to business problems, and then through WBL they 'learn at work' about the difficulties and challenges of applying these changes in the workplace (Boud and Solomon 2001). Hence, more and more employers are encouraging their employees to attend those courses that offer the combined benefits of ABL and WBL activities and exposure (White 2012).

ABL and WBL learning is achieved through many different mechanisms, some of which are described below:

- Accreditation of prior learning through Accreditation of Prior Experiential Learning (APEL) gains the student access to further professional programmes;
- Prescribed industrial, commercial or service work placements as part of a full-time student programme;
- Use of problem-based learning exercises within professional courses to accelerate the development of transferable skills and knowledge to use in the students' workplace;
- Part-time students at HE institutions where action and problem-based learning are a core element in the delivery of new knowledge and skills to these nascent professionals' continuing development, and where workplace learning is encouraged through collaborative projects.

ABL and WBL revolves around three key deliverables that differentiate it from classroom learning: firstly, it calls for reflective analysis of workplace practices; secondly, it focuses on action learning in groups; thirdly, it marries the creation and acquisition of new knowledge with collaborative collective activity – both sharing the problem and potential solutions, with the importance of taking action and learning the challenges of implementing it in the workplace (Raelin 1997).

This study focuses on the many beneficial outcomes from using ABL and WBL, as a underpinning approach in business school's postgraduate/professional courses particularly aimed at creating and enhancing professional knowledge, skills and experiences of mid-career managers (Coghlan 2007). The use of consultancy style modules, that is, where students provide solutions to "real life" issues from the business community, is not a new phenomena within Higher Education Institutes (HEIs) or business schools, many HEIs incorporate problem-based learning to help enhance the students skills in problem solving (Bak 2011), though few have their students spend time throughout the project immersing themselves in the enterprise culture. The executive MBA programme run at the University of Hertfordshire focuses on delivering new skills and insights for mid-career managers, and importantly using ABL and WBL to enhance the learning and value delivered to the student and the business. The business community delivery is equally as important as the student experience. In the recent Lord Young's report (2013) on micro-business growth in the UK, great importance was placed on the value that business school's can deliver to this specific sector of the business community. One significant area of knowledge and expertise that business schools hold is that possessed by its academics and work-experienced postgraduate student cohorts, it is only natural to consider leveraging this in the form of collaborative projects? Recent research has highlighted the increased activities around engagement with SMEs, with the best claiming over 36,000 collaborations since 2008, equally the value of CPD courses with SMEs exceeds over £100million (Witty 2013).

Small- to medium-sized enterprises can gain from this same knowledge and expertise exchange, gaining improved management skills, insights and foresight concerning new business opportunities (Thorpe 2013). The longer-term outcomes are in the creation and dissemination of both tacit and explicit knowledge, implicit within the broader aims of work-based learning (WBL), that are beneficial to both academic and practitioner communities alike. Ultimately, the supply of managers with skills and knowledge around identifying and enacting change

initiatives appropriate to the increasing demands of our ambiguous and uncertain workplace environments, will be beneficial (Brennan 2005).

Increasing costs of energy and fuel and the ever-present government pressures to reduce carbon emissions provide two strong forces by which businesses are being pressured to change. Businesses are therefore challenged to understand and enact changes to their processes and systems that meet both the need to reduce energy consumption, and at the same time deliver eco-innovations e.g. using recycled materials, alternative sustainable resources and purchasing/embedding new energy efficient equipment. Getting support and assistance in capturing and then embedding the new knowledge and expertise required is a challenge. If universities and business schools are to increase their engagement with the SME community, undertaking collaborative projects, many of these embedded into the curriculum of business & management courses, then embracing ABL and WBL is crucial.

The findings highlight the challenges of using ABL in the classroom to identify sustainability opportunities, collecting appropriate theory and practice to present the business. Then using WBL to understand, interpret and implement the proposed changes in the workplace – undertaking work training and mindset changes initiatives to overcome initial barriers. The discussion and conclusion sections then discuss the many reflections from both the students and business regarding the deliverables and potential long-term impact of the implemented initiative.

Drivers for Eco-innovation in SMEs and Opportunities for ABL and WBL

Sustainable innovation is heavily dependent on organizations, public and private, developing sustainable systems of production and consumption, such that they minimize the social and environmental impacts of their actions. The most widely acknowledged and referred to definition of sustainability is that provided by the United Nations World Commission on Environmental and Development (WCED, 1987: 1):

> *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs".*

The importance of sustainable development to the SME community is looking at this as an opportunity rather than a threat (BERR 2010).

Sustainable Innovations – Eco-innovation

There are many types of innovation associated with driving sustainability or, more importantly, decreasing the social and environmental impact of production and consumption behaviours. Many of these innovations which will be referred to as "sustainable innovations", (SI) revolve around the creation of new or modified processes, techniques, systems and products that eliminate or reduce environmental harm such as: pollution control, clean-up, waste management and recycling technologies (Carvalho and Berbieri 2012). However, for the purposes of this study we focused on preventive innovations, those that alter the production

and consumption of products, processes and techniques to directly reduce or eliminate environmental impact.

SI may have social and environmental benefits, but for the small to medium-sized enterprises they need to see economic benefits too. This specific SI is often called 'Eco-innovation', where sustainability is driven by the need for both economic and environmental benefits, resulting often in competitive advantage (Simpson, Taylor et al. 2004). Some enlarge it further to take into account social impacts too, suggesting that "the introduction of products, production processes, management or business methods, new or significantly improved, that bring economic, social and environmental benefits when compared to alternatives" (Carvalho and Berbieri 2012: 146). To initiate sustainable innovations requires a trigger or champion to push it through, an external or internal champion can be pivotal in driving this. These nascent champions often require a community by which they can access new knowledge and experience, thus substantially reducing the risk of failure by providing active support (Coakes and Smith 2007). More recent research has at least identified that some academics are working within their institutions to facilitate knowledge transfer to their local business community, ensuring that SME needs and expectations are focused on clearer outputs with clearer evidence of financial returns (Lockett, Kerr et al. 2008).
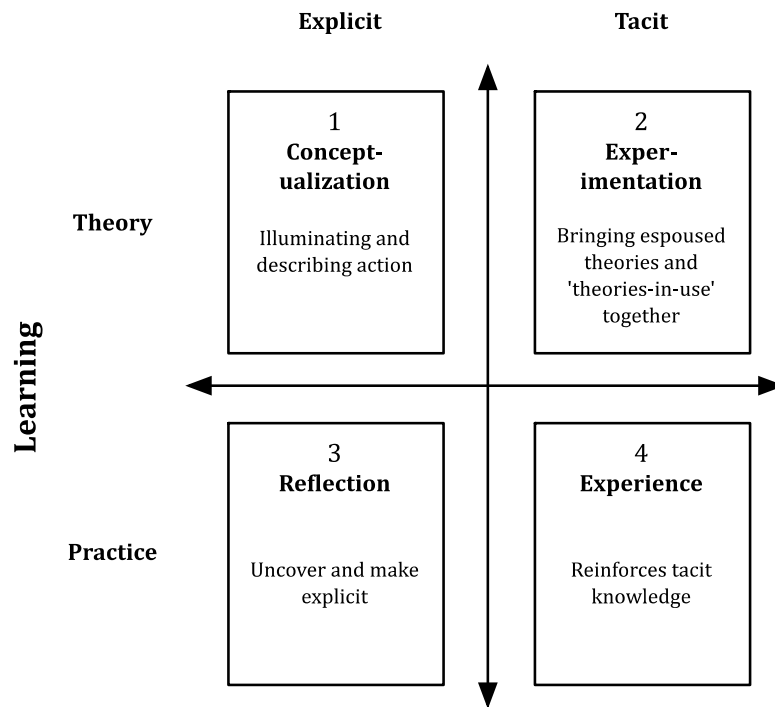
Action-Based Learning (ABL) and Work-based Learning (WBL)

Action learning is a process of learning and reflection that encompasses real business challenges and issues, whilst being supported by a community of peers and colleagues and with a goal of action (McGill 2004). This study utilizes action learner's (the MBA student's) and places them in the workplace to work on real business challenges, and through the process generate workplace learning and help deliver realizable actions (Dretske 1981). What can be learnt at, or in, work is equally as valuable as that derived from the lecture theatre or classroom (Ebbutt 1996). This type of learning supports the UK government's perceptions of continuing professional development and employer collaboration (Dearing 1997).

Postgraduate courses are aimed at developing these mid-career managers, such as the MBA programme, and incorporate methodologies that prepare and promote the students' work effectiveness through regular engagement in relevant work-based learning (WBL) activities alongside their traditional classroom learning. This linkage between workplace learning and reflection on work practices is an important part of the student's learning from experience (Raelin 1997). This experience is gained through working in groups, discussing ideas, sharing the problem and developing collective and creative solutions – in so doing they create and disseminate knowledge, both tacit and explicit. The importance of the student's understanding of the links between explicit knowledge from the classroom combined with their own from work experience, helps them develop learning styles.

Interestingly, previous research on learning styles and knowledge forms has revealed distinct relationships that fosters learning and skills development (Raelin 1997), see figure 1 below.

Figure 1: Linking Learning Styles to Knowledge Types
Knowledge

| | Explicit | Tacit |
| Theory | **1**
Concept-
ualization

Illuminating and
describing action | **2**
Exper-
imentation

Bringing espoused
theories and
'theories-in-use'
together |
| Practice | **3**
Reflection

Uncover and make
explicit | **4**
Experience

Reinforces tacit
knowledge |

Learning

Diagram adapted from the original by Raelin (1997)

These learning types are styles that students/learners use to help learn effectively. Depending on the nature of the business problem, the student/learner will use the knowledge from the classroom to understand the problem and describe what they see (1). The students/learners need to move on to trying out their conceptual knowledge, and here they encounter a dissonance between theory and practice (Raelin 1997). It is here that they learn how to modify and adapt their espoused theories, those they bring into the practice with their theories-in-use. Hence increasing changing their espoused theories to make them more applicable to the problem in hand (Argyris and Schon 1974). (2). Finally, experience reinforces the tacit knowledge, the modified espoused theories, within the practitioner. This learning acquired through experience is often without the student/learner awareness; they will often find it hard to verbalize what has been learnt. Yet, this form of implicit learning builds valuable tacit knowledge, and those practitioners inevitably have a sense of the correct action to take (4). Reflection provides the student/learner with ability to take their planned, observed and achieved activities and construct meaning, and hence turn the learning from these into explicit knowledge (Raelin 1997). (3).

Applying the above learning styles directly to the UH MBA programme creates an underlying framework by which the academic, students and business managers can work together, see figure 2 below.

Figure 2: Business Action-based Learning Model (BALM)
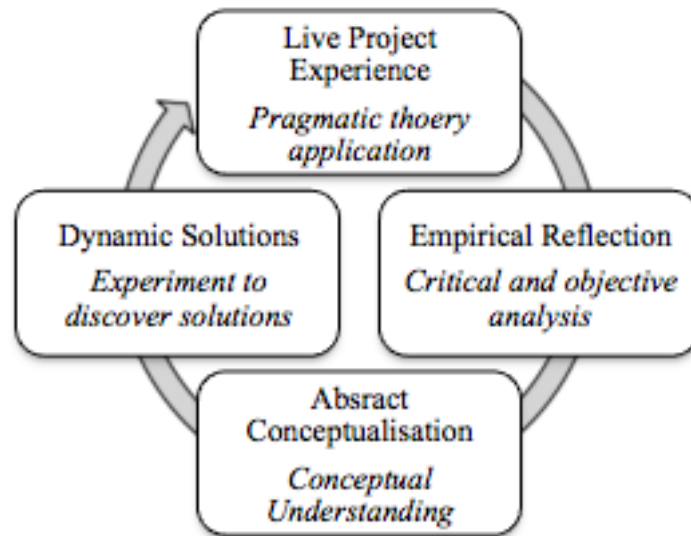
The BALM conceptual framework is further considered in the findings and discussion pages.

Co-creation through Collaboration

Over 140,000 business and management graduates go through business schools every year. This significantly contributes to the growing talent employed in UK businesses (Thorpe 2013). A recent report by the Association of Business Schools (Thorpe 2013) stressed the increased need for the integration of practice into teaching, and that this should come from developing stronger relationships particularly with micro and small-businesses, so widening adult participation in HE. The Leitch review emphasized the importance of the whole adult workforce in meeting the high-level skill needs of industry in the future, not just through the supply of 18 – 21 year old graduates (Leitch 2006). To create work-wise postgraduates, business schools and businesses must work collaboratively on committing to a flexible but focused continuous professional development series of courses that more readily meet businesses needs (CIHE 2010). Within the SME sector, it is acknowledged that not all enterprises have the capacity or the motivation to grow (Wilson 2012), yet those who do use strategies such as: up skilling their workforce, understanding and exploiting new markets, increasing productivity, improving leadership skills and developing new products.

Co-creation between the business and the customer has become a significant body of research and practice. Its development has be largely linked to the growth and power of the internet (Prahalad and Ramaswamy 2000). The customer finally had access to an almost inexhaustible supply of collective knowledge on the product and the business. This resulted in more consumer-initiated interactions with businesses, effectively switching power from the business to the consumer. Delivering added-value to the customer now entails collaborating with all stakeholders, including the customer newly acquired knowledge and expertise (Makelin and Reuhkala 2012). Collaboration in this context includes the combining of businesses resources with those talents and capacity external, as Makelin called "smartsourcing".

Over the last decade significant effort has been focused on formal mechanisms for linkages and interactions between the HEI sector and SMEs (Johnson and Tilley 1999), however these formal links need to be augmented with more informal and specific to individual SME owner-

manager needs. SME's owner-managers understand the value of action learning opportunities and its contribution to team building outcomes (Gordon and Jack 2010). Some limited research has already highlighted the potential wider benefits of HEI engagement/collaboration on SME's other communities, through which they source knowledge and expertise (Youtie and Shapira 2008, Gordon and Jack 2010).

These existing connections of the SME help them develop social capital, making collective action both possible and beneficial. It is then important that business schools connect with these micro- and small-enterprises, to be both trusted and valued, as important members of these extended communities too (Starkey and Tempest 2005, Starkey and Tempest 2008). Through this the collaborative projects co-create value, not just for the student and academic, but also for the business owner-manager and their community members (Hynes, Costin et al. 2010).

Research Strategy

Studies involving understanding and interpreting the 'How's' and 'Why's' are best undertaken by using an interpretive case study approach (Yin 2003). The case study approach is becoming an increasingly popular method for studying individual and group learning within SMEs (Eisenhardt 1989, McAdam, Keogh et al. 2007). In this study, using the question 'how sustainable innovation can be enhanced by the use of a work-based learning project', reveals some interesting and valuable practices that could be repeated in other institutions' programmes. During this process many specific questions were used to explore 'why' certain events and activities are pivotal to the adoption of SI processes and systems – especially those challenging existing attitudinal and behavioural practices of the workforce. At the same time as the business owner-manager's attitudes and behaviours influence the likely adoption of a SI, so too does their membership of the collaborative project community. A qualitative design that includes the observation, description and interpretation of these shared and learned patterns – especially those surrounding the values, beliefs and behaviours of any sustainable innovation is essential (Creswell, Creswell et al. 2013). This research therefore fits within the case study methodology (Yin 1984; Eisenhardt 1989), and specifically that involving interpretive ethnographic approaches to understanding and interpreting the beliefs, values and attitudes of the various actors involved in the project (managers, drivers and other operational staff). It is also important that the MBA team member observations were noted and used in the analysis and conclusions.

Our focus in this study was on one particular business project within the Business Action Learning (BAL) module on the Hertfordshire Business School (HBS) MBA programme. The business project typifies the type of business problems used within this action-based learning module over the last six years. BAL offers groups of part-time students an opportunity to work on a project where they can identify and solve business problems from the local SME community. The project reported on in this article was based on a waste management business, whose major customer was the local council, and was conducted over a four months period.

Case Study

Broxbourne Services (BS) is an organization operating in both the public and private sectors. It is facing significant pressures to both reduce its operating costs and deliver CO2 emission reductions to its clients. The organization delivers a number of frontline services on behalf of the local borough council, including grounds maintenance, street cleaning, highways maintenance, domestic refuse and kerb-side recycling collection services, but also has private sector clients. The organization has a £7million annual turnover, and employs 150 people, using 84 vehicles of various descriptions to deliver these services.

Business Action Learning (BAL) module - Approach

The MBA team had four months to collect, analysis, produce and implement a business solution. The team comprised of three members, all of which worked in Local Government, with one individual having particular responsibility for the transport operations within Broxbourne Services.

The Business Action Learning (BAL) module on the MBA programme is focused around action learning: taking problems, challenges and issues from businesses and developing the students' ability to define, investigate, develop solutions and plan the implementation, Figure 2 below, provides a diagrammatic representation of this process.

Figure 2. Business Action Learning Process

Action Learning Process - MBA Enterprise Development
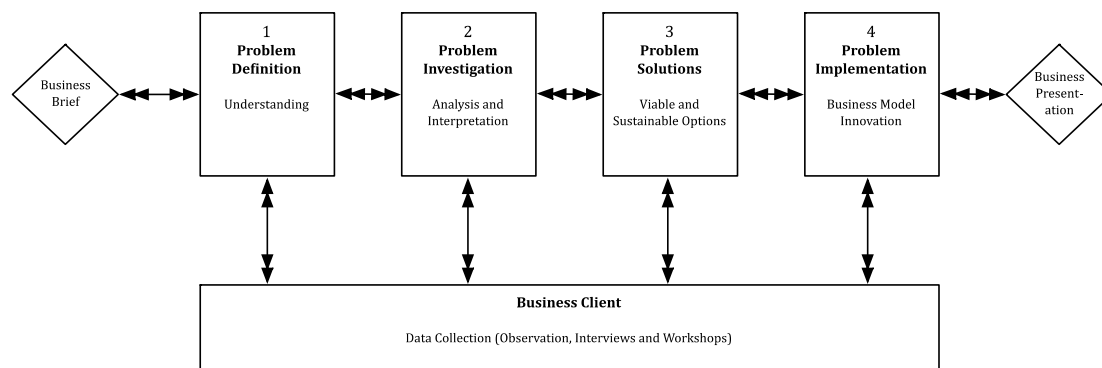
Stage 1: Problem Definition

The original company problem statement was:

> 'As a consequence of the Comprehensive Spending Review (2010) Broxbourne Services were required to find an additional savings of £1.5m over the next four year period. This coincided with UK government and the Local Government Association agreeing on a 25% reduction in CO_2 emission by 2015. Currently Broxbourne Services produce 4,000 tonnes of CO2 per annum. How can Broxbourne Services cut expenditure and CO2 emissions whilst maintaining a full service to its clients?'

The problem definition stage was important for the team to define the nature of the problem, and confirm this back to the business. The team achieved this by:

- Quantifying the problem in terms of its influence over the businesses' processes and systems – what is the impact on the underlying business model?
- Identifying the tools they will use to analysis the problem and its impact

The advantages of using problems from the students' own organizations were:

- They had access to the organizations' resources – to carry out interviews and analysis;
- There value to the student of taking a problem from their own work environment to demonstrate their professional and personal attribute in the area of problem solving

The next stage in the business action learning process was to investigate the problem and start developing some solutions.

Stage 2: Problem Investigation

To support the team in their problem-based learning, lectures and workshops are conducted in problem-solving techniques. Problem-solving approaches from one of the top strategic consulting firm was presented and discussed (Rasiel and Friga 2002). Students were exposed to a range of business and management analytical tools both freshly introduced in this module, and through reference to other tools introduced in previous modules on the MBA programme. Critical discussion took place about the advantages, disadvantages and appropriateness of the various tools to investigate the source and causes of business problems.

Previous studies on problem based learning suggested this could limit the scope for creativity and the diversity of possible solutions (Bak 2011). In this case study all three team members worked in local government, and therefore had insights into the problems associated with the prevailing culture and management systems. To understand the problem they assessed the business impact and extent of fuel costs across all services.

Review by the team identified the following costs and consumption figures, see table 1 below.

Table 1: Broxbourne Services (Variance in 2009-10 to 2010-2011) Fuel usage

Fuel Type	Litres used	%increase	Cost (£)	%Increase	Average Cost (£/l)	%increase
Diesel	5,066	2%	£48,422	17%	£0.13	15%
Gas Oil	8,114	34%	£6,324	62%	£0.09	21%
Petrol	376	6%	£1,123	19%	£0.11	12%
All fuels	13,556	4%	£55,869	19%	£0.12	14%

This positive increase in consumption and costs was due to two main factors: a general 4% increase in consumption, but a significant 12% of the cost increase was due to higher fuel costs.

Reviewing the breakdown of fuel consumption across the different service areas showed the following:

Table 2: Breakdown of Fuel Consumption by Service Area (2010/11)

Service Area	Street Cleaning	Grounds Maintenance	Other Services	Waste Collection Freighters	Waste Management other vehicles
Usage	20%	11%	8%	49%	12%

These waste managers freighters are the vehicles used to collect refuse, green waste and kerb-side recycling.

At this stage of the project they could see what services consumed the most fuel, and then followed this with interviews and observations of the operational and management staff. This identified successive areas of ineffective and wasteful operational processes. Having identified the problem and working processes/practices responsible for the relatively large fuel consumption, they progressed on to developing solutions/alternatives.

Stage 3: Problem Solution

The team was encouraged to use differing techniques to help devise solutions to the business' problems, these included conducting "ideation" workshops for both management and operational staff. Each of the ideas is roughly assessed:
- Its benefits and costs to improve fuel and operational efficiency, including actual Return On Investment (ROI) calculations;
- Applicability of the solution especially over time – these were measured both against the business' and the government's Key Performance Indicators (KPIs) – cutting costs and CO_2 emissions.

The team used a number of business toolkits to help analysis and present their findings at this stage of the project.

Local government organizations are under constant pressure to act as 'leading lights' within their respective communities, and at the same time deliver value for money. This challenge can create barriers to innovation, as they are being increasingly driven towards a low cost operational model. Analysis of both the macro and micro factors identified, see table 3 below:

Table 3: Macro and Micro-mitigating Enablers & Barriers to Innovation

Macro-Environmental Factors	Micro-Environmental Factors
Economical	**Economics**
Cost of Diesel set to rise by £85k in 2 years (+)	High Start-up costs (-)
Broxbourne Council must reduce spending by £1.5m over next 4 years (+)	Large scale capital costs (-)
Technological	
Development in alternative fuel options (+)	
Legislation & Regulations	
Low emission zone (+)	
Broxbourne Council commitment to reducing Co2 emission by 25% on 2015 (+)	

+ an enabler for innovation; - a barrier to innovation

Many of the barriers to innovation come from internal processes associated with the organizations' business model – in particular the three interlocked activities: systems, processes and resource mobilization. After extensive workshops carried out with the personal involved with these activities the MBA team where able to identify the key restraining forces, see table 4 below.'

Table 4: Restraining Forces – Systems, Processes and Resources

Restraining Forces	Objectives
Resources	**Goal**
Sustaining the effect of driver training	Reduce fuel consumption and the resulting CO2 emissions
Changing attitudes and mindsets;	
Systems	**Objectives**
'Task and Finish' contracts of employment	Develop more efficient systems and processes;
Capacity and capability of management to lead; and embed the change	More effective management of frontline resources, systems and processes;
Life of service contracts do not align themselves to significant capital investment;	Change workforce behaviours and establish a new sustainable culture.
Processes	
Vehicles not efficient and costs of replacement is high.	

The final stage of the project addresses the delicate issue of implementation.

Stage 4: Problem Implementation

For the team this was perhaps the most difficult stage of the project, or certainly the one that challenged them the most. The challenges came from three primary areas:

1. Assessing the possible implementation problems – both internal management and operational staff and their client-base;
2. The requirements for change – business systems and culture;
3. Motivating and getting the commitment to the new scheme from management and operational staff.

Many of the arguments the students used in this final piece of the report and in their presentation to the business came from the detailed analysis of the deliverables from the short-listed options.

A key element of getting buy-in from the businesses' management was to present their potential solutions with detailed breakdowns of benefits, costs and difficulties associated with implementation. Many of the solutions initially looked at had considerable costs to implement. The team decided to rank and prioritize the solutions based on the risk and impact associated with the initiative, the difficult of implementation based on the enablers and barriers, and ultimately the potential achievement in fuel savings and CO_2 emission reduction, see table 5.

Table 5: Business Solutions

Business Solution	Description	Risk/ Impact Score	Underlying Enablers and Barriers to Implementation	Fuel Savings and CO_2 benefits
Preventing Journeys	Preventing any unnecessary journeys and ensured vehicles is efficiently used.	18	Strong Management commitment IT Systems and data Local Autonomy Local Knowledge 'Custom and Practice' behaviour 'Us and them' culture 'Task and finish' culture	19,686 litres and 51,782 kg
Fleet Management	Reducing the amount of time vehicles spend running whilst stationary to save fuel	18		4,680 litres and 12,310 kg
Route Optimization	Fuel consumption reduction by optimizing collection rounds, ensuring drivers follow the most efficient route	18		n/a
Performance incentives/changing driver behaviour	Incentive scheme to encourage ownership of the business problem.	17		n/a

The final part of the project is the presentation to the client. The MBA teams are asked to prepare ten-minute presentation carried out at the client's site; supporting materials, such as posters and the final report were also required.

Stage 5: Reflection on the Outputs, Outcomes and Expected Impact

Students participating in this MBA module are expected to reflect on the three important aspects of the knowledge and learning processes, and to discuss how they influenced and directed their project deliverables.

In summary, feedback from the MBA teams, over the five years that this module has run, suggests that problem-based learning contributes to the acquisition of critical knowledge and skills whilst at the same time exposing students to the complexities and ambiguities of managing action learning where outputs, outcomes and impact are important.

Findings and Discussions

Business schools' involvement in the development of appropriate, relevant and effective management development and learning programmes can only be achieved if their interventions are reflective of both the academic and practitioner requirements (Hynes, Costin et al. 2010). This will have a secondary benefit of improving the image of business schools as being mainly concerned with exploring the history of past business performance, to a focus on informing and educating our future management of a new vision of sustainable business practice systems (Starkey and Tempest 2005). Academic staff involvement with students from this business environment has to be on the basis of being co-learners, co-creators and co-evaluators of business-relevant action-learning – designed, developed and delivered to meet industry, organization and individuals' needs. The deliverables from this type of action learning are threefold: the individual learning, the organizational learning and academic learning in understanding what employers need and want from their professionals, gaining knowledge through practice as opposed to formal instruction (Higgins and Aspinall 2011).

This Business Action Learning (BAL) module has become exceedingly valuable to the students on the MBA programme, enabling them to understand how to apply their management learning to real-life applications. By focusing on business problems within their own organizations and sectors they are more highly motivated and engaged in the process, and recognize the addition value deliverable to their own employers. These two key deliverables support our previous discussions on the value of combining Work-based Learning (WBL) with an Action Based Learning (ABL). The value of using this type of learning approach has been demonstrated with its application to one businesses challenge in initiating eco-innovation initiatives into their workplace. The value to the students and business manager is easily identified when you apply the BALM framework (see Figure 2 above) to the learning outcomes. During the initial phase of the project the students used very traditional management tools to analysis and critique current practices and processes. They were then able to sit down with the business managers and discuss their own understanding of the problem and barriers, and so gain some sense-making of the key areas. They were then able to develop several dynamic solutions, and then test these in the business. Eventually coming up with a practical solution delivering both economic and environmental benefits. The process has a structure that helps those that initially struggle with undertaking this type of problem solving task. Academic staff

on the BAL module were keen to encourage creativity and innovation in both the approach and development of a solution.

Increasingly, HEIs are key knowledge producers in any knowledge–based economy, and part of the knowledge asset is in the co-creation of business solutions through collaborative projects between HEIs and businesses. Many of these projects will be government-funded schemes through specific collaborative calls by the Technology Strategy Board (TSB) and Research Councils (RCs), or other consultancy services offered by the different HEIs. However, there exists an opportunity to increase the scope and frequency of business problem-based learning opportunities through its wider use in graduate and post-graduate curricula. This would match the governments, Higher Education Funding Council for England (HEFCE) and the Association of Business School's (ABS) own call to increase the role that business school's play in the SME community (Thorpe 2013, Young 2013, Ulrichsen 2014).

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