Institution: Loughborough University

Unit of Assessment: C19 Business and Management Studies

Title of case study: The PEArL Framework: Facilitating Change in Complex Social and Commercial Settings

1. Summary of the impact

Loughborough University research into Problem Structuring Methodologies has resulted in PEArL, a device for framing the manner in which change occurs in organisations. The application of PEArL has changed organisational practice and policy in a variety of environments – including manufacturing, community and scientific settings – with far-reaching and long-lasting consequences. It has been used by the British Association for Chemical Specialities to achieve improved biocidal labelling; in homeless shelters to enhance outcomes for residents in adopting more stable lifestyles; and by Jaguar Land Rover to improve governance and achieve better oversight for senior management across product creation pipelines.

2. Underpinning research

Problem Structuring Methodologies (PSM) support problem solving and change in complex social situations. Two of the best known are Strategic Options Development and Analysis (SODA) and Soft Systems Methodology (SSM). One of the main problems with change initiatives is that validation is difficult, as the process is not directly repeatable. Most approaches focus on creating a roadmap to a new state, but this can be inadequate in dynamic, fast-moving social environments: plans can become defunct very quickly if circumstances change.

The PEArL (Participants, Engagement, Authority relationships, Learning) framework offers a unique approach to managing interventions by validating how the process of change is undertaken. PEArL arose from research carried out at Loughborough University by Dr Donna Champion, who joined Loughborough in 2001 and is currently a Senior Lecturer in Information Systems. The originality of PEArL, which Champion developed through several action research projects, is that interventions are managed even when participants and requirements change, as occurs in most real-world practical situations.

Champion began her research in 2001 by setting out the theoretical underpinnings of PEArL, based on soft systems theory. PEArL was conceived as an original intellectual device to allow those impacted by change to plan, manage and evaluate the change process at different stages in order to assess the credibility and validity of the intervention. The PEArL mnemonic focused on who should (or could) be involved, how these people might be engaged in the inquiry, what authority (financial, social, intellectual etc.) is needed, what new relationships might be encouraged and which relationships ought to change or end **[3.1]**.

The concept was developed further when Champion conducted a project in which residents and key workers at a shelter for the homeless applied PEArL to help residents define and build new, sustainable relationships to support a more stable lifestyle. This work was undertaken through a series of workshops with a group of 10 key workers and seven residents. Key workers and residents applied PEArL to support reflection on the issues that caused the residents to become homeless and to identify relationship networks needed to successfully move towards a less chaotic lifestyle. This research demonstrated that PEArL could be learnt quickly and used by people with no technical experience or training. It also rigorously established that the PEArL framework could be of value in the real world in complex situations **[3.2]**.

Champion and John Wilson (Professor of Operational Research, Loughborough University, 1972-2011) went on to argue for a set of contingency factors to support PSM validation. PSM experts were asked to set out the factors they felt could influence the validation of PSM-supported change. This revealed that “how” a change is managed is just as important to participants as the outcomes of a change and that such a judgment should be made both by experts and by other participants. The PEArL framework was put forward as the only existing approach to support such judgments **[3.3]**.

3. References to the research

3.1. Champion, D. and Stowell, F. (2003). Validating Action Research Field Studies: PEArL. *Systemic Practice and Action Research*. 16(1): 21-36, ISSN 1094-429X. DOI: 10.1023/A:1021928511690.

3.2. Champion D. (2007) Managing Action Research: The PEArL Framework. *Systemic Practice and Action Research*. 20(6): 455-465. DOI: 10.1007/s11213-007-9070-8

3.3. Champion, D. and Wilson, J.M. (2010). The Impact of Contingency Factors on Validation of Problem Structuring Methods. *J. Operational Res Soc.* 61 (1): 1420-1431. ISSN 0160-5682. DOI: 10.1057/jors.2009.94

Evidence of Quality of the Research

3.1, 3.2 and 3.3 discuss original research undertaken for the first time at Loughborough University. All three research outputs have been through rigorous peer review with a minimum of two blind reviews.

The importance of the PEArL Framework has also been recognised through financial support from Jaguar Land Rover:

G3.1. Research Project Title: Embedding Systems Engineering in Jaguar Land Rover, £35, 935, PI: Dr Donna Champion

In addition, the papers on the PEArL framework have been cited by researchers from across the world including Europe, the USA and New Zealand.

4. Details of the impact

The PEArL framework that developed as a result of Loughborough University research into Problem Structuring Methodologies has been successfully used to change organisational practice and policy in a range of settings, delivering a variety of benefits to stakeholders.

The British Association for Chemical Specialities (BACS) has used PEArL throughout the impact period to improve understanding of the label claims of specialist chemicals, especially biocidal products. The organisation, which represents companies operating in the speciality chemicals sector of the chemicals supply chain, first became aware of PEArL through the then Chair of its Biocides and Biosciences Group, who studied under Champion while obtaining his MBA at Loughborough. BACS, which engages with the government and also helps inform policy and regulation at European level, initially used PEArL to prepare for major changes to working practices in the way biocidal products are regulated as a result of the Biocidal Products Directive. It employed the framework again to prepare its members – which include multinational companies and SMEs – for the latest Biocidal Products Regulation 528/2012, details of which were released in 2012. The former Chair of the Biocides and Biosciences Group has remarked that PEArL helped BACS "reconceptualise the processes required to label biocidal products in order to be compliant with BPD legislation" **[5.1]**.

The ease with which people with no technical experience or training can use PEArL has been demonstrated through continued work with residents of homeless shelters. In 2008 the Exaireo Trust was formed as a charitable organisation to support homeless people in Charnwood, Leicestershire, and now runs nine shelters across the county. PEArL is used by key workers at the Trust to support their work and has contributed to residents being more successful in keeping their accommodation and making positive connections and relationships to support their new lifestyle. Resident-created PEArL diagrams, which offer insights into residents' views of their situation, have proved particularly useful. An Exaireo worker has observed: "PEArL helps you understand things from a more realistic perspective. It stops you thinking you can solve things quickly... [It] helps give the residents a voice to express some of their problems. It's very simple but focuses on helping them change relationships, which is the hardest thing to help them see." **[5.2]**

PEArL's industry applications have been evidenced by major car manufacturer Jaguar Land Rover (JLR), which began using the framework in May 2010 after Champion met with senior managers to discuss problems in the implementation of automotive functional safety standard ISO 26262. This sets out best practice for designing and developing automotive electronic and electrical safety-

related systems and impacts on every functional area of an original equipment manufacturer. Having been introduced to the research outputs, JLR managers initiated a project to identify the roles and responsibilities for new governance and communication structures to introduce a coherent approach to functional safety in the company.

Senior managers at first believed separate governance for Functional Safety was unnecessary. Information collected and analysed using the PEArL framework changed their minds and convinced them to supply the resources needed to implement new functional safety governance structures, which have now been in operation since March 2011 and continue to oversee and manage ISO 26262 implementation activities across the whole company. A JLR Functional Safety Technical Specialist has described PEArL's role in tackling issues raised by ISO 26262 as "invaluable" **[5.3]**.

Building on the success of this initiative, JLR commissioned a project to apply PEArL to identify key gaps in product design activities. This set out evidence-based changes to roles and responsibilities. As a result, new governance structures, cross-functional relationships and training events have been implemented to give better oversight of product creation. PEArL has been of particular value in identifying where expertise and authority for certain aspects of design were situated within the company. These new relationships have proved their value in acknowledged better co-ordination across engineering and back-office teams. According to JLR's Technical Specialist (Systems and Software Engineering PMTi), Champion has "identified and driven the implementation of new governance structures... and commenced the education and training to support business transformation towards systems engineering" **[5.4]**.

In February 2011, in recognition of PEArL's value to the company, JLR invited Champion to join its Steering Groups for functional safety **[5.5]** and systems engineering **[5.4]**. PEArL-informed decisions now affect every member of the Product Creation teams, as well as staff from the Manufacturing, Service, HR, Finance, Purchasing, Marketing and Senior Management teams. The output from this work has been included in new training and educational experiences that are being rolled out across JLR's Electronic, Electrical and Software divisions **[5.4]**.

5. Sources to corroborate the impact

The following sources of corroboration can be made available at request:

5.1. British Association for Chemical Specialities (BACS)
Letter of Evidence from former Chair of BACS Biocides and Biosciences Group.

5.2. Work with Leicestershire Homeless Shelters
Signed interview transcript from Senior Key Worker at the Exaireo Trust

5.3. Letter of Evidence from the Technical Specialist Manager for Functional Safety, Jaguar Land Rover

5.4. Letter of Evidence from the Technical Specialist Manager for Systems & Software Engineering, PMTi , Jaguar Land Rover.

5.5. Letter from Senior Manager –Automotive Safety, JLR confirming membership of the Functional Safety Steering Committee due to contribution from research