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Action Research in OHS - Shifting from Hypothesis Testing to Experiential Learning?

W. Patrick Neumann
Ryerson University, pneumann@ryerson.ca

M. Ekman

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Human Factors Engineering Lab, Ryerson University

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W. Patrick Neumann And M. Ekman

For more details see the case study example:

Neumann, W.P., Ekman, M. and Winkel, J., 2009. Integrating ergonomics into system development - The Volvo Powertrain Case. Applied Ergonomics, 40(3): 527-537. doi:10.1016/j.apergo.2008.09.010

Neumann, W.P., Ekman, M. (2008) Canadian Association for Research on Work and Health (CARWH) Annual Conference, Montreal, June 15-17.

Action Research in OHS – Shifting from Hypothesis Testing to Experiential Learning?

W.P. Neumann[1] (pneumann@ryerson.ca) and M. Ekman[2]
1- Mech. & Industrial Engineering, Ryerson University, 2- The Swedish Royal Institute of Technology

This paper introduces and discusses the use of 'Action Research' (AR) modalities in ergonomics intervention research as a means to improve intervention quality and study the process of organisational change.

WHAT is AR? AR is a non-experimental approach similar to participant-observer techniques that would aim at engaging organisations and individuals in a mutual exploration of a practical problem faced by the participants – in this case occupational health and safety (OHS). Action Researchers work with organisational stakeholders in a collaborative fashion; using workshops, dialogue conferences, and individual discussions to support, advise and observe organisational change from an embedded position. Based on early work of Lewin (1951) AR emerged from the sociological research background but has been applied in a wide range of organisational settings. The aim is to support the impulse for improvement while observing how the efforts proceed to find new ways of working that are acceptable to the parties involved. It focuses on the process of learning rather than quantified out-comes. It emphasises broad engagement of stakeholders who in developing multi-factor interventions. Learning on OHS practice occurs for both participants and researchers.

AR surrenders positivisms fertile certainty of a single absolute world, best suited for the study of inanimate objects or isolatable phenomena. Instead, AR is post-modern in that it accepts the multiple perspectives of different stakeholders as all being valid – reflecting the complexity of organisational systems. Although post-positivistic, AR does not abandon empiricism. Nor does it abandon theory. AR applies an ongoing exchange between theory and observation. Neither is super-ordinate. It is this reflection between the observed change efforts by company stakeholders, and the supporting activities of the researcher, that can both challenge and develop theory while also helping stakeholders formulate new means of acting that suit the particular circumstances of the individuals and organisation involved.

WHY AR? OHS intervention research has begun to recognise reaching the limits of the Newtonian positivistic perspective (Griffiths, 1999). The problem of OHS belongs to what systems theorists call a 'wicked problem' which are characterised by the impossibility of decomposing the problem and the complexity of the system involved. System complexity implies unstable relations between system elements, emergence of behaviours from the interaction of system elements, and susceptibility to preconditions (the butterfly effect). System elements cannot be understood singly and then combined linearly – there is a need to study entire systems since the emergence and instability of relations can lead to non-linear and 'irrational' system behaviours. Organisations, we argue, are complex systems. What works in one organisation won't necessarily work in another and might not work at some other time-point for even that same organisation. This, in part, explains the difficulty experimental research has in demonstrating consistent effects in their intervention efforts (e.g. Karsh et al., 2001). AR, alternatively, favours working closely in the particular context to study how stakeholders can build on their contextual knowledge to solve their problems in new ways – it is research *on* practice.

CHALLENGES of AR - One of the biggest weaknesses of AR is said to be its lack of acceptance by those operating within the dominant experimental paradigm- sceptics may say: 'That's not science!'. This is effect is exacerbated for AR in reporting in journals that assume a conventional experimental report form. The necessary narrative of process descriptions can seem long and ambiguous compared to conventional quantified comparisons. Also, AR has no response to criticism that the intervention should have been conducted differently. Nor is there a finite end point to AR; termination of the project is essentially an arbitrary act. Finally it is difficult to learn AR methods as few university program teach this approach..

STRENGTHS OF AR – AR places a heavy emphasis on achieving organisational change in ways that are sensible and sustainable for those involved. It does not rely on recollections of, and articulation by, chosen participants as in interviews. It avoids dependence of the company on researchers and is consistent with reports of improved change success with the engagement of all affected stakeholders. The AR approach can support companies in learning new ways to improve OHS that are not constrained by researchers' control needs and that are uniquely adapted to the organisation in the people in it. To reap these benefits however the researcher must shift from a mode of hypothesis testing to experiential learning.

REFERENCES:

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KARSH, B.-T., MORO, F. B. P. & SMITH, M. (2001) Theoretical Issues in Ergonomics Science, 2, 23-96.
LEWIN (1951) Field Theory and Social Science, New York, Harper Row.

Action Research in OHS –

Shifting from Hypothesis Testing to Experiential Learning

W.P. Neumann – Ryerson, Industrial Engineering
M. Ekman – Swedish Royal Institute of Technology

The Challenge of Knowledge Aplication

- Technology Implementation problem- early efforts Ineffectual:
  - Information Technology (IT paradox)
  - Robotic Assembly (Auto Sector)
  - 'Ergonomics'…?
- Sociotechnical Mismatch?
  - Needed to fit technology to the situation

Success of Change Efforts

Table I
Success rates for five types of organisational change

	Literature search (1990-2001)			Our sample	
Type of organizational change	Number of studies	Sum of sample sizes	Median success rate (%)	No. of projects	Success rate (%)
Re-structuring and downsizing	9	4,830[a]	46	49	10
Technology change	5	1,406[a]	40	32	28
Mergers and acquisitions	9	395[a]	33	37	14
Re-engineering and process design	7	3,442[a]	30	75	23
Culture change	3	225[a]	19	59	19

Note: [a] One or more reports did not state the sample size

(Martin E. Smith, 2003) – Leadership & Org. Dev. J.

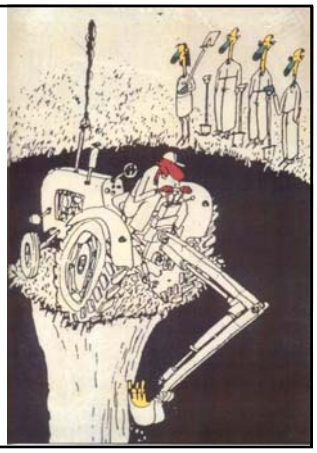
- OHS Intervention research is reaching the limits of Newtonian Positivistic Perspectives (e.g. Griffiths 1999)

> **"Standardised questionnaires, structured interviews, and statistical analyses cannot begin to grasp the complex fabric of organizational change."**
> *– Badham et al. 1995*

"The traditional research paradigm … has not worked that well. …

It has produced very reliable results about very unimportant things."

Schein 1991



Organisations are Complex systems

- Initial Conditions (Butterfly Effect)
- Complex Patterns (Strange Attractors)
- System Dynamics (Changing Relations)
- Unexpected Linkages (Emergence)
- Open System (System Boundries)
- Self organising, open systems

How to investigate such systems?

'The New Production of Knowledge'

- Mode 1:
  - Theory Focussed, "Newtonian", Positivistic
  - Experimental
  - Hypothesis Testing
- Mode 2
  - Solution Focussed
  - Collaborative
  - Experiential

Gibbons et. al 1994

Action Research

- More an approach than a 'method'
  - Philosophically different from experiments
  - Observe real change while 'embedded'
  - Balanced participation and observation ('paradox' of AR)
- Post-modern
  - Accepts the validity of multiple perspectives
- Participatory
  - Researcher is a participant

AR

Kurt Levin (1946) 'Action Research and Minority Problems' *Journal of Social Issues* 2(4), 34-36

- Research supports change efforts
  - Company OWNS the process
  - NOT an 'experiment'
- Coaching
- Dialogue across boundaries
- 'learning' focus
- Co-Investigation

Action Research as Collaborative Investigation

- Knowledge generation at point of application
  - Needed for success
  - Solution to fit unique local situation
- Collaborative Research
  - Multi level learning
- Rich information flow
  - Difficult to say in real time what is important

AR Science

- RIGOUR?
  - From methodologies inside the AR study
  - Potential for quantified evaluation exists… but should be company based
- Analytic transferability
  - No general case
- Constructivist tendencies
  - Partly outside the 'bubble of positivism'

Challenges of AR

- Acceptance "That's not *SCIENCE*!"
  - Publication difficulties if experimental anecdotes are expected
- Rigour difficult to define
  - Depends on assessment inside study
  - Info flow is too rich for high resolution tools?
- "You should have done it differently"
  - But.. No size fits all –> improvisation
- No fixed end (start) point - butterfly effect

Action Research

- Theoretically based
  - Theory development
  - *Reflecting on utility, not testing correctness*
- *Empirically based*
  - *Is deeply rooted in observation*
  - *Aims at action*
- *Subjective relying on observers'*
  - *experience & knowledge of theory*
  - *available empiri*

STRENGTHS of AR

- Emphasises org. change in ways making sense to those involved
  - Participatory
  - Sustainable development (learning)
- Engagement of broad stakeholder base consistent with reports of successful change
- Generates knowledge ON application THROUGH application

Concluding Remarks

- AR has acceptance issues
  - like qualitative research in the past?
- Provides insight into org. change
  - Theory in Use (not espoused theory)
- AR as learning by experience rather than testing of hypotheses
  - Can it hybridize with evaluation science?

Avoid Methodolatry

"In Science, as in love, a preoccupation with technique is likely to lead to impotence."

P. L. Berger

STOP TALKING ABOUT HERE