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Centre of Research Expertise for the Prevention of Musculoskeletal Disorders

Adapting a knowledge transfer framework from health care to the construction sector

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Diffusion of Innovation in Construction: Getting new ideas adopted on MSD-prevention

Forming a bridge from construction to knowledge transfer

Why are we doing this:

- Construction is very underresearched
- 35% of all LTIs are due to MSDs
- Fascinating sector!
- We could never do this without our research partners: the Construction Safety Association.

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Action research: Stakeholder partners are core to the project

Assembling the research team

Research collaborators: CSAO

- They came up with the research question
- The problem is their problem!
- They help design the study, conduct, execute, and analyze, help access their networks & workplaces, offer expertise, disseminate research results







The PARiHS framework -- to guide our research into **Diffusion of Innovations**

(Promoting Action on Research Implementation in Health Services)

Focus on the relationship between:

- The nature of the EVIDENCE;
- The CONTEXT in which the change is implemented;
- And the way the change is FACILITATED.







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Making the link from Health Sector to Construction

Welding the concepts together

Focus on the PARiHS constructs:

- The EVIDENCE we collect on our innovations must be sound and fitting with our sector's beliefs.
- The knowledge we gain on our sector, as a CONTEXT, must look at receptivity, look for opinion leaders, and take into account the culture.
- How we FACILTATE the diffusion of our innovations will depend on the strength of our evidence, the culture of the sector, but also the credibility of our messengers.





Phase I: What did the sector need to know?

Constructing an evolving program of research

Piloted a hydraulic ladder lift:

- VAC committee identified the innovation; was evaluated.
- 13 companies persuaded to adopt the new innovation.
- Became "opinion leaders".
- Workers told their buddies.

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Companies planning on buying new ladder lifts.

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Phase II. Finding credible EVIDENCE

Forming the evidence base

Multiple sources of innovations:

- Found in trade publications.
- Identified on work sites.
- Evaluated by team.
- Now have 15 innovations.
- Regarded as practical by sector –productivity, quality, and costs. Not necessarily MSD priority.







Getting to know the construction CONTEXT:

Digging into the Context

Complexity:

- Employers pay salary; Unions pay benefits
- Employers hire through the union halls
- Responsibility for OHS is divided and diluted

Networks:

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- Unions do OHS training
- Apprenticeship programs have OHS training

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CSAO safety groups essential

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• Worksite-project networks

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SOCIAL CAPITAL & NETWORKS

Dimension of social capital	Benefits	Drawbacks
Structural	Network of REMs provided access to engineering knowledge and expertise that was otherwise difficult to obtain	Redundancy of information and knowledge due to shared backgrounds and experience of REMs
Cognitive	Shared engineering language, meanings and assumptions facilitated communication	Network of REMs used to the exclusion of other sources of knowledge within or outside the company
Relational	Strong norms of reciprocity and trust established among REMs, and between REMs and site staff	Pressure to succumb to regional operating needs and norms that emphasized the importance of immediate commercial returns

Table 1 Benefits and drawbacks of social capital

REM, Regional Engineering Manager.

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•M. Bresen, L. Edelman, S. Newell, H. Scarborough and J. Swan, Exploring social capital in the construction firm, Building Research and Information **33**(3) (2005), 235-244.

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UNION NETWORKS

Stable

- Skill acquisition
- Relational

Mixed communication methods











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IHSA/CSAO NETWORKS



- Voluntary membership
- Health and safety focused

Communication usually written









WORKPLACE NETWORKS

- Heterogeneous workforce
- •Requires problem solving skills
- Mixed management
- Unstable/flexible
- Communication verbal







NETWORK KNOWLEDGE TRANSFER







Phase III: FACILITATING the adoption of innovations

How construction workers get new information

Facilitating communication

- Experiential knowledge is passed verbally.
- Opinion leaders in the sector are important.
- Workers watch and learn from each other.

Knowledge Transfer techniques

- Informal: tailgate discussions, watch-and-learn.
- Opinion leaders: access through networks.
- Training: through unions and apprenticeships.
- Media: websites, Tweets, Blackberry downloads.





Next Steps: Creating MSD-Prevention messages

Getting the message out

The research goes on

- New innovations keep emerging
- Pictograms on MSD prevention
- The informal sector
- Role of migrant and injured workers











References

P. S. Adler and S. Kwon, Social Capital: Prospects for a New Concept, Academy of Management Review 27(1) (2002), 17-40.

S. P.Borgatti, P. Foster P. The network paradigm in organizational research: a review and typology, Journal of Management 29(6), (2003), 991-1013.

M. Bresen, L. Edelman, S. Newell, H. Scarborough and J. Swan, Exploring social capital in the construction firm, Building Research and Information 33(3) (2005), 235-244.

H. Davies, S. Nutley and I. Walter, Why 'knowledge transfer' is misconceived for applied social research, Journal of Health Services Research & Policy 13 (2008), 188-190. A.M. DeJong and P. Vink, The adoption of technological innovations for glaziers: evaluation of a participatory ergonomics approach, International Journal of Industrial Ergonomics 26 (2000), 39-46.

P. Entzel, J. Albers and L. Welch, Best practices for preventing musculoskeletal disorders in masonry: Stakeholder perspectives, Applied Ergonomics 38 (2007), 557-566. M. Gillena, S. Koolsa, J. Sumb, C. McCalla and K. Mouldenc, Construction workers' perceptions of management safety practices: A gualitative investigation, Work 23 (2004), 245-256.

T. Greenhalgh, G. Robert, P. Bate, O. Kyriakidou, F. Macfarlane and R. Peacock, How to spread good ideas: A systematic review of the literature on diffusion, dissemination and sustainability of innovations in health service delivery and organization. London: National Coordinating Centre for NHS Service Delivery and Organization R & D 2004.

X. Huang and J. Hinze, Owner's Role in Construction Safety, Journal of Construction Engineering and Management Feb 2006, 164-173.

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A.L. Kitson, G. Harvey, B. McCormack, Enabling the implementation of evidence based practice: a conceptual framework, Quality in Health Care 7(3) (1998), 149-158. A.L. Kitson, J. Rycroft-Molone,, G. Harvey, B. McCormack, K, Seers, and A. Titchen, Evaluating the successful implementation of evidence into practice using the PARISH framework: theoretical and practical challenges, Implementation Science, 3:1, (2008) 1-12.

D. M. Kramer, P. L. Bigelow, N. Carlan, R. P. Wells, E. Garritano, P. Vi, and M. Plawinski, Searching for needles in a haystack: Identifying innovations to prevent MSDs in the construction sector,. Applied Ergonomics. (2010). doi: 10.1016/j.apergo.2009.12.003

D. Kramer, P. Bigelow, P. Vi, E. Garritano, N, Carlan and R. Wells, Spreading good ideas: A case study of the adoption of an innovation in the construction sector. Applied Ergonomics, 40, (2009), 826-832.

D. Kramer, D. Cole, & K. Leithwood, Doing Knowledge Transfer: Engaging management and labour with research on employee health and safety. Bulletin of Science, Technology & Society. 24(4), (2004), 316-330.

D. Kramer & D. C. Colem Sustained, Intensive Engagement to Promote Health & Safety Knowledge Transfer to and Utilization by Workplaces. Science Communication, 25 (1), (2003), 56-82.





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References

D. Kramer and R. Wells, Achieving buy-in: building networks to facilitate knowledge transfer, Science Communication 26(4) (2005), 428-444.

M.M. Lehtola, H F. van der Molen, J. Lappalainen, P.L.T. Hoonakker, H. Hsiao, R.A. Haslam, A.R. Hale and J. H. Verbeek, The effectiveness for Preventing Injuries in the construction industry, American Journal of Preventive Medicine 35 (2008), 77-85.

C. Mitton, C. Adiar, E. McKenzie, S.B. Patten and B.W. Perry, Knowledge transfer and exchange: Review and synthesis of the literature, The Milbank Quarterly 85 (2007), 729-768.

A.D.F. Price, A. Bryman and A.R.J. Dainty, Empowerment as a Strategy for Improving Construction Performance, Leadership and Management in Engineering January (2004) 27-37.

L. Punnett, L.J. Fine, W.M. Keyserling, G.D. Herrin and D.B. Chaffin, Back disorders and nonneutral trunk postures of automobile assembly workers. Scandinavian Journal of Work, Environment & Health, 17 (1991), 337-346.

Ani B. Raidén and A.R.J. Dainty, Human Resource Development in Construction Organisations An example of a chaordic learning organization? The Learning Organization, 13(1) (2006) 63-79.

M. Rinder, A. Genaidy, S. Salem, R. Shell and W. Karwowski, Interventions in the construction industry: A systematic review and critical appraisal, Human Factors and Ergonomics in Manufacturing, 28, (2008), 212-229.

E. Rogers, Diffusion of Innovation, fifth ed. Free Press, New York, 2003.

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Rose, J. A Canadian View of Labor Relations in Construction. Industrial Relations 18 (2) (1979), 156-172.

E.S. Slaughter. Implementation of construction innovations, Building Research & Information, 28 (2000), 2-17.

A. Styhre P. Josephson and I. Knauseder, Organizational Learning in Non-writing Communities The Case of Construction Workers. Management Learning, 37(1) (2006), 83-100.

A. Suraji, K, Sulaiman, N.I Mahyuddin and O.Mohamed, Rethinking Construction Safety: An Introduction To Total Safety Management Journal Of Construction Research 7(1&2) (2006) 49-63.

H.F. Van der Molen, J.K. Sluiter and M.H.W. Frings-Dresen, Behavioral change phases of different stakeholders involved in the implementation process of ergonomics measures in bricklaying. Applied Ergonomics 36 (2005), 449-459.

F.M. van Eijnatten, G.D. Putnik. Chaos complex learning and the learning organization. The Learning Organization 11(6) (2004) 418-29.

Weil, Building Safety: The role of construction unions in the enforcement of OSHA, Journal of Labor Research XIII (1992), 121-132.

M.G. Weinstein, S.F. Hecker, J.A. Hess and L Kincl, Roadmap to Diffuse Ergonomic Innovations in the Construction Industry: There is Nothing So Practical as Good Theory. International Journal of Occupational and Environmental Health 13 (1) (2007), 46-55.

R. Wolford, Intervention Research in Construction: A Hypothetical Case Study of Painters, American Journal of Industrial Medicine 29 (1996), 431-434

