# Knowledge Transfer in Occupational Safety and Health: the influence of practitioner skills

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**Abstract.** The use of knowledge transfer methodologies in safety and health has been limited. This paper reports on a larger project which examined sources of knowledge available, knowledge transfer and the skills required for knowledge transfer. Using a mixed-methods approach including review, a questionnaire survey of practitioners and twelve organisational based case studies; the project identified a number of key skills that influence the success of knowledge transfer interventions. Key skills identified within the research include being able to identify authoritative sources of knowledge, the ability to translate knowledge into local language and finding the best way of communicating knowledge and information.

**Keywords.** Knowledge transfer; occupational safety and health; practitioner skills; diffusion of innovations

## 1. Introduction

Knowledge based views of organisations are highly relevant to the wider OSH landscape because "knowledge transfer leads to the integration and coordination of specialised knowledge [and] makes replication possible" (Prevot, 2008). However, research in relation to KT and occupational safety and health (OSH) has focused on the different role of researchers and practitioners in OSH (Roy *et al.,* 2003) and the importance of the development of knowledge networkers and knowledge brokers to develop useful research questions (CIHR 2006). This paper reports on an IOSH funded project which examined KT in OSH in relation to knowledge production to knowledge transfer within organisations.

KT can trace its origins to the 1960s and the work of Rogers (1983) and the diffusion of technology (innovations) in different organisational settings (see Figure 1). This was due to the drivers of increased scientific knowledge and the increasing expectation that scientific knowledge should be useful to society. The work of Rogers resulted in the 'Diffusion of Innovations' theory that allowed the descriptions of early adopters through to laggards in the diffusion process, depending on the stage in the KT lifecycle that the knowledge is transferred. KT was not used as a term until 1995 by Zander & Kogut (1995) who identified the importance of knowledge in relation to competitive advantage. KT allows for the integration of specialized knowledge, allowing it to be replicated and skills and competencies improved; this is highly relevant to those involved in safety, health and ergonomics. Successful KT requires that knowledge travels from the source, through a medium to a user and the success of this also depends on who is transferring knowledge, the content of the message and its relevance, the way it is transmitted and the receptivity of the user (Senapathi 2011).

The OSH Knowledge project aimed to examine KT in the context of OSH from those that provide OSH knowledge to those that receive it at employee level (Crawford *et al*., 2015). The three year project examined OSH knowledge provision in the UK and who

were recognized as authoritative providers of OSH knowledge. In addition to this, the project surveyed practitioners to identify which sources of OSH knowledge they were using, as well as the barriers and facilitators to KT in the OSH context. To gain more in-depth information in relation to the flow of knowledge from providers to employees, organisational based case studies were carried out within companies who had made an OSH change in the preceding 12 months. The aim of this paper is to summarize the results of the case studies as well as identify practitioner needs for those working in the OSH environment.

## 2. Methods

Structured interviews and an employee survey were developed to evaluate the flow of OSH knowledge in organisations where an OSH intervention had occurred. The interviews were developed based on the Diffusion of Innovations Theory approach in evaluating the knowledge transferred and the media used to transfer it; how the intervention was undertaken (persuasion), if the employees adopted the new knowledge (decision), how the KT was implemented and confirmation methods used to evaluate this. A full description of methodology development is available in Crawford *et al.,* (2016). Structured in-depth interviews were carried out with stakeholders involved in developing the intervention including the knowledge broker (in most cases a safety practitioner) and others such as employee safety representatives, union representatives or other relevant managers. A sample of employees in each organisation was asked to complete a short survey including questions about their awareness of the intervention, an adapted safety culture questionnaire and the perceived impact of the intervention. The data collected was collated and mapped to identify the process undergone in relation to key knowledge transfer concepts and the success of the intervention.

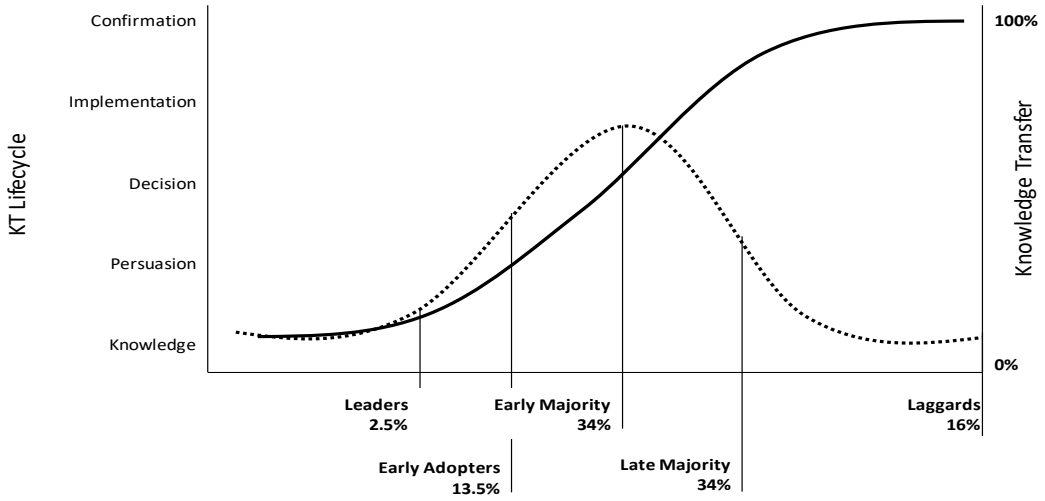


*Figure1. Diffusion of Innovations approach*

## 3. Results

### *3.1 Case Studies*

Twelve organisations agreed to take part in the research study, eight who were retrospectively evaluated and 4 where a prospective and retrospective evaluation was carried out. Table 1 summarizes the organisations who took part in the research, labelled as case study 'a' to 'l', identifying the company type, size and intervention type. Data were collated from each of the organisations and mapped to identify some of the key factors associated with a successful intervention and successful KT.

All of the knowledge brokers, apart from one company, the skip manufacturer, were safety practitioners and had several years' experience of practice within current and previous organizations.

*Table 1 Case Studies Included in the Research*

| **Company type** | **Intervention** | **Size of company** |
|---|---|---|
| a. School within a University Retrospective | Portable electrical equipment safety intervention | Large |
| b. Catering Industry Supplier Retrospective | Introduction of H&S committee | Large |
| c. Roofing company Retrospective | Refresher face fit training | Small |
| d. Skip manufacturer Retrospective | Re-emphasis of hearing protection | Small |
| e. Engineering and construction Retrospective | Introduction of a new induction process | Large |
| f. Construction, engineering and development Prospective | Introduction of a new type of cable locator | Large |
| g. Facilities Management Retrospective | Introduction of a Health Surveillance Matrix | Large |
| h. An aerospace and defence company Prospective | The impact of change in policies and procedures for working at height | Large |
| i. Housing Association Retrospective | Introduction of an Office Safety Network | Large |
| j. Fire Safety Group Retrospective | Introduction of health and safety policies and risk assessments | Micro |
| k. International Retail Company Prospective | Introduction of a new online Health and Safety induction | Large |
| l. Banking and financial services company Prospective | Health and Safety documentation and intranet content re-design as part of the 'Health and Safety Remediation Programme' | Large |

In evaluating the interventions these were examined in relation to the methods used to translate knowledge, persuasion, decision, implementation and confirmation. The level at which the case studies were at in relation to KT at the time of the evaluation interviews and surveys is summarized in Table 2 as either yes or ongoing for each case studies against each of the KT lifecycle stages. These data identified that the knowledge translation process had been successful for all organisations either in relation to already being successful or as an ongoing process. This is due to the knowledge brokers translating the knowledge into embodied knowledge to allow it to be integrated into policies, strategies or guidance.

The methods used for persuasion and decision making by the organisations were also found to be successful in the majority of companies through using different methods within different contexts, such as the use of already existing communication routes, whether those were electronic methods in large organisations or face-to-face communication in smaller organisations. This highlights some of the barriers in

translating knowledge when more complex messages are best delivered face-to-face but in large geographically spread organisations this is not always possible.

For the majority of the case studies the success of the implementation was still ongoing at data collection stage and confirmation of an impact of the KT was also ongoing. This relates to the timing of the confirmation of the change where some companies had not started this. However the methods that had been used to assess confirmation included health and safety audits, awareness evaluation, feedback from employees, visual inspection and wash up meetings to identify improvements.

*Table 2 Summary of the case study knowledge transfer results*

| | **Knowledge Description** | **Persuasion** | **Decision** | **Implementation** | **Confirmation** |
|---|---|---|---|---|---|
| Case Study | Success | Success | Success | Success | Success |
| a. R | Yes | Yes | Yes | Yes | Yes |
| b. R | Yes | Yes | Yes | Ongoing | Yes |
| c. R | Yes | Yes | Yes | Ongoing | Ongoing |
| d. R | Yes | Yes | Yes | Ongoing | Yes |
| e. R | Yes | Yes | Yes | Ongoing | Ongoing |
| f. P | Yes | Yes | Yes | Ongoing | Yes |
| g. R | Yes | Ongoing | Ongoing | Ongoing | Yes |
| h. P | Yes | Ongoing | Yes | Ongoing | Ongoing |
| i. R | Yes | Yes | Yes | Ongoing | Ongoing |
| j. R | Yes | Yes | Yes | Yes | Ongoing |
| k. P | Yes | Yes | Yes | Ongoing | Yes |
| l. P | Yes | Yes | Yes | Ongoing | Ongoing |

*R= Retrospective, P= Prospective*

*3.1 What Skills do our Professionals Need for Successful KT?*

In addition to the case studies examining knowledge flow, a number of skills required by the knowledge broker were also identified. As stated earlier, knowledge brokers in the case studies were all experienced safety professionals (apart from d) and had tacit knowledge in relation to how to carry out an OSH intervention. However, it was unclear whether those skills had been acquired through experiential learning, through training or from having worked in a previous field. By identifying these skills, it is possible to map them on to current training programmes to identify any gaps. Table 3. presents a collation of skills identified by the KT lifecycle stages.

Firstly being able to identify authoritative knowledge is a key skill for all professionals involved in the safety and health arena. In certain respects, such skills are taught within the health arena to ensure that health professionals are able to evaluate evidence before taking it into practice. However, it is perceived that such skills are still developing within other OSH professions (Safety, Ergonomics and Occupational Hygiene).

*Table 3 Collation of skills required by the OSH Practitioner*

| KT lifecycle stages | Skills Required by the OSH Practitioner |
|---|---|
| Identification of knowledge | Ability to search for materials and assess the quality of this knowledge. |
| Persuasion | Be able to consider the context of the intervention, its messages and the transfer of these. |
| Decision | Be able to make an informed decision on the communication method(s) for KT, taking in to consideration other variables. |
| Implementation | Be able to understand and assess the level of employees in relation to readiness and the safety culture. |
| Confirmation | Be able to use appropriate methods to evaluate whether a change has been successful and where improvements can be made. |

All knowledge brokers in the case studies (prospective and retrospective) planned the OSH intervention either formally or informally. This included understanding of the need for careful timing of interventions, working with senior management in this process and then developing an implementation plan.

One of the areas identified within the case study research was the level of understanding that the OSH practitioners had about the need to translate knowledge into accessible formats, local language, context and reading skill level. Again, it is not known where these skills are obtained but it is apparent that this type of skill is required for OSH professionals.

As well as a consideration of the audience there was also a tacit understanding of the need to use different methods of transfer for different intervention topics and types. Although this appeared to be influenced by company size, the use of local champions within the larger companies reiterated the understanding that face-to-face contact was important either through the knowledge broker or others in the organisation. When we consider the use of media richness against choice of media type this appears to be a natural choice within the case studies.

The choice of confirmation methods identified within the stage 1 survey and the 12 case studies included visual confirmation (where relevant), such as risk re-assessment, walkthroughs and discussions with members of staff. There are a number of readily usable tools available for the OSH practitioners including risk assessments and audit that can be used to confirm change. Again the method used to confirm changes was dependent on the intervention, the company size and whether there was intended to be a change in behaviour or updating information to employees or a new safety committee. This suggests that the OSH practitioners in this case were making decisions that fitted the interventions as to how best audit.

## 4. Discussion and Conclusion

This work is important to the broader arena of occupational safety and health and ergonomics. The case studies allowed the development of a methodology to evaluate knowledge transfer and also allowed a better understanding of the barriers and facilitators to KT in the context of OSH within organisations.

The importance of this work to all practitioners is in understanding the skills that are required in acquiring and transferring knowledge. An important part of future training is to enable all our practitioners to be able to find and evaluate authoritative knowledge

sources including systematic reviews or research papers; including those translated into guidance and codes of practice.

Both the survey and the case studies undertaken in this project have identified that OSH professionals have an understanding of the different communication methods for KT and the appropriateness of these for different audiences. For example, for induction training and other more complex issues, face-to-face contact was identified as being important in ten of the case studies. Yet when trying to get information across to more senior people in a business, meetings and electronic media were seen as acceptable. However, it was observed that for large companies, electronic media may be the most efficient method of transferring knowledge due to geographical location; however an example in the case studies to reinforce the messages in this kind of instance was the use of local champions to support the transfer process.

Within the ergonomics field the importance of taking a participatory approach in the workplace is well recognized and is part of the curriculum for professionals. However it is unclear where the tacit knowledge about KT was acquired by professionals involved in this research in relation to translating research into practice, planning OSH interventions and evaluating the impact of such interventions. If these skills are acquired as part of experience, then including them in the required curricula for professionals would allow for the quicker attainment of these skills rather than experiential learning. This highlights the management skills of the OSH practitioners involved in the research and also may reflect the change from prescriptive OSH management to risk management. Again, these skills, which may be described as communication or soft skills, are key for the practitioner.

In conclusion, this project identified some of the key skills for practitioners in OSH in relation to transferring OSH knowledge in the workplace. Future research should examine how the tacit skills identified within the sample group were acquired to enable future practitioners to gain KT skills as early as possible.

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