

HEALTH AND SAFETY: ACADEMIC RESEARCH AND PRACTICAL APPLICATION

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Construction health and safety management continues to be a popular and worthwhile topic for research. Many issues have been identified, such as subcontracting and casualization, and the problematic nature of researching the topic acknowledged.

This paper reports a case study of an innovative method of Health and Safety training introduced on a construction site in Leeds. The site manager arranged for representatives of all the subcontractors and direct labour gangs to meet at lunch one day every week. Sandwiches and drinks were provided as an incentive, and attendance was very good. The lunch meetings provided the opportunity to discuss Health and Safety matters for the site, and for operations running at that time. The intention was to prevent or minimize the accidents on the site. The discussion of other issues (such as financial problems, delays or damaged work) was prevented by the site manager, who led the discussion.

In the case study, the number of reported accidents was less than for similar sites over the same period. The contracting company, Totty Construction awarded the site manager with a prize for the innovation.

The conclusion of the paper raises the question of the purpose of research into Health and Safety: developing understanding and dissemination amongst the academic community or developing understanding and disseminating practical advice amongst practitioners.

Keywords: health and safety.

INTRODUCTION

The record of Health and Safety in construction remains one of the more intractable problems for practitioners, academics and commentators alike. The reports show that construction is still one of the most dangerous commercial activities, and that accidents and incidents refuse to show any significant downturn in the face of increased legislative and managerial effort.

Some generalized comments have become accepted as likely explanations for this situation:

The lack of, or reduced training, as apprenticeships are diminished and changed to modern apprenticeships and different forms of training become the norm.

Casualization of the workforce as increased numbers of operatives on site are self employed

The increased use of subcontractors and the blurring of responsibility for Health and Safety of personnel on site

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Whether these are acceptable explanations for the situation or not, one issue is not contentious: the health and safety record for construction is poor and efforts must be made to improve this.

Much research and publication activity is devoted to Health and Safety in construction. The majority of this research is aimed at a review of the changes in, and impact of, the legislation covering health and safety matters, for example Construction Design and Management (CDM) Regulations 1994; the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995; the Construction (Health, Safety and Welfare) Regulations 1996; the Personal Protective Equipment at Work Regulations (PPE) 1992 and the Control of Substances Hazardous to Health (Amendment) Regulations 1999.

The common aim, and the stated intention of all of this legislation is to improve the safety and welfare of construction activity. The legislative framework provides rules which not only guide, but restrict behaviour and action on construction sites (and associated environments) in order to improve the safety performance of individual sites, and of the industry as a whole. The restrictions and limits on behaviour are considerable, and the legislation is clear on the responsibilities of all parties involved in the process. (e.g. Griffith and Howarth 2000). However, the outcome of these legislative acts is somewhat questionable, there are discrepancies between the improvements perceived by participants in the construction process and the statistical data available for the incidence of accidents (Howarth *et al.* 2000). This in turn raises questions of the methodology of collection and validity of statistical data.

Some research examines the management and enactment of construction legislation. In principle, the intention has been to embed Health and Safety as a central issue in the management of all construction operations. Rather than Health and Safety being considered as an adjunct to the managerial process, it must be considered equal (at least) to all other considerations. This intention is enacted through the development of management systems, which not only take account of, but incorporate the requirements of the legislation into the standard operating procedures. (Druker and White 1996, Griffith and Howarth 2000). This research is faced with the problem that the technological and operational context of the construction site is constantly changing over time. Different risks arise with different stages of the project, and the managerial enactment has to take account of this.

Further research looks at the problematic nature of enforcement of legislation (Cheetham 2000). The fragmented nature of construction activity, spread geographically across the whole country, transient in nature, and for every site over £500,000 in value, many more under £25,000 makes the policing of Health and Safety legislation incredibly difficult. As Cheetham reports the nature of contractual agreements between parties makes successful prosecution of guilty parties almost impossible. Further, the dissemination of successful prosecutions to other parties is lacking. (*ibid.*)

Some common issues are revealed by all of this research:

The problem of the safety record of construction activity remains a large one.

Commentators have noted that this problem contributes to the negative image of the industry and to the problem of recruitment caused by that image (Druker and White 1996)

The gathering of evidence, particularly statistical evidence is fraught with problems. Central to this is the change in legal requirements for the reporting of accidents (RIDDOR) 1995, but also the fragmented nature of the sector makes the collection of statistical data on any issue problematic. (Howarth *et al.* 2000)

Issues of causality in accidents are difficult to pin down. The reporting tends to concentrate on the injury itself (for example broken arm) and the general cause (for example fall from scaffold due to missing handrail). What is rarely investigated or reported is the circumstances which led to the victim working in that specific area or the reason the handrail was not in place at that time. Research into the incidence of accidents associated with a specific construction technology – metal decking – for example, found it difficult to attribute any links between techniques and accidents.

There is an unstated acceptance that on site not all legislative requirements are adhered to in all circumstances. Essentially compromises are made between the restrictions on behaviour imposed by the legislation and the productive requirements of the construction operation. This compromise is made by personnel at every level, with operatives often knowing that it is their own safety and welfare which is being put at risk by such actions. It is possible to draw similarities in this behaviour to driving: although the speed limits are intended to reduce accidents, and to improve the safety of the drivers as well as pedestrians, many drivers will knowingly exceed the speed limit. This action compromises their own safety, but makes the journey time less (possibly!). It is fair to say that this compromise in behaviour is for construction activity a major issue. It is also fair to say that most research does not acknowledge this compromise.

CASE STUDY

For this case study, the paper reports the methods of Health and Safety training and dissemination introduced on a construction site in Leeds. As the case study is bounded by the activities which occurred on this specific site, no claims are made for the results in the abstract sense. Indeed, in the conclusions, the authors take issue with the purpose of research into Health and Safety.

In common with many projects of a similar nature and value, (£7.5 million 61 weeks), the Totty project in Leeds involved a number of subcontractors, a number of self employed workers and a number of directly employed Totty operatives. Again, in common with other projects, the duration spent on site by each party varied, some in parallel and some in series, some for the majority of the project and some only for brief periods. Further, some of the personnel were known to the site management team, and to each other and some were ‘novices’.

The co-ordination of the activities of all the different subcontractors and operatives on site is *the* major responsibility of the site manager. The success and final completion of the project is dependent on the integration of all the operations demanded of the different productive personnel.

Accepting the notion that the Health and Safety issues of the project are paramount, these should be embedded in the system of co-ordination enacted by the site manager.

The means by which this was attempted for this project is as follows:

Representatives of all subcontractors and direct labour gangs were invited for lunch one day every week throughout the duration of the project. The site manager provided

sandwiches and drinks for the gathering, as an incentive. Attendance was good from the outset, and a routine was maintained throughout the project duration. The lunch break provided an opportunity for all present to discuss issues of health and safety pertaining to their operations at that time. One of the problematic issues raised earlier was the recognition that the conditions on site, and the associated areas of risk, are changing throughout the duration of the project. This forum provided a constant updating of the conditions on the site.

Of particular importance is that all of the discussion of Health and Safety issues was concerned with the immediate: that specific project at that specific moment in time. The general legislative requirements were referred to, and emphasized by the Site Manager, but the focus of the discussions was the current operations on site. The meetings afforded the opportunity to share 'expert knowledge' about particular activities. As construction technologies become more specialized, and the organizations which carry out those technologies also specialize into subcontracting organizations, the familiarity of all personnel with all site activities becomes less common. Many operations will be novel to the other operatives on site, and the inherent safety issues will be unknown to them. This forum whilst specifically focussing on safety issues, allowed more general sharing of knowledge amongst the personnel. From the response of participants there was evidence that this feature of the meetings was attractive. *"You get to know each others' problems, what they hav to deal with and what's important to them"*.

The Site Manager, in facilitating the process, ensured that each activity on the site was included, and that due attention was paid to identified areas of risk. It is fair to say that the meetings facilitated an ongoing risk assessment for the site. In addition, the Site Manager ensured that more general discussions of site progress, damage or money were kept off the agenda as far as possible.

Once the nature of the meetings became clear to the participants, most were enthusiastic about attending, and positive contributions were forthcoming without any prompting. Many participants reflecting on the experience were vocal in their support.

FINDINGS

The reports of recorded accidents for the project were significantly less than the main contractor would expect for a project of similar size and nature. One of the effects of this finding was the awarding of a prize for innovation to the Site Manager.

The possible reasons for this finding are as follows:

The practical advice and sharing of information had an impact on the behaviour of the site personnel, with a greater awareness of the health and safety issues of the activities of all operatives on site. This raised awareness helped to prevent the occurrence of accidents.

The involvement of the personnel in an innovative process effectively made those personnel feel special. The impact on behaviour was a 'Hawthorne Effect' wherein the participants changed their behaviour due to the extra attention being paid to them. The 'group and informal relations' were as important a variable as any management effort. (Furnham 1997) The active encouragement of the Site Manager to contribute to the process was key to this.

The size of the sample, in statistical terms, is not really valid for comparison, the same result may have appeared whether the intervention had taken place or not. The

results for accidents on site are averaged over a number of projects and over a number of years, taking a single case can be misleading.

It is difficult to dismiss the last of these possible reasons. In response, the authors would suggest three things: repetition of the innovation to collect more data; the perceptions of the participants which were positive – if they believed the innovation had a positive effect, then would further data dispel that perception?; the value of the case study, both in terms of research and in terms of actual behaviour modification is claimed only for itself.

Taking the first two possible reasons into account, the authors would make no claim for one before the other: both may be equally ‘valid’ or each individually. The two reasons are not mutually exclusive. Attributing notions of cause and effect to behaviour modification is a difficult and problematic issue (e.g. Jackson and Carter 2000, Furnham 1997), and the authors will not attempt this within this paper. Furthermore, in following this argument, the authors would not preclude any other suggested reasons from the list above. As a further complication, it may be questioned that behaviour modification can be attributed for the improvement in accidents on the site. Again, the authors acknowledge this, but will not pursue it here.

For the authors, the findings raised the notions of ‘abstract knowledge’ and ‘contextual knowledge’ (Portwood 2000). In essence, abstract knowledge can be described as that knowledge which has validity in and of itself, *without* reference to its surroundings. It is extremely difficult to provide examples of such knowledge as a ‘single insoluble truth’ outside, perhaps, works of faith. The majority of knowledge exists within and with reference to paradigms of knowledge (e.g. Jackson and Carter 2000). However as an ‘ideal type’ (Weber 1994) the notion of ‘abstract knowledge’ provides an antithesis to the notion of contextual knowledge which has specific reference in and relevance to its environment. As an example of contextual knowledge, the dissemination of information provided at the lunchtime meetings would be excellent.

The knowledge has reference to the specific site on which the meetings took place. The knowledge has reference to the activities proceeding on that site. The knowledge depends upon the contribution of each ‘expert’, i.e. those individuals who have greater experience and familiarity with their specific activity. The knowledge is ‘created intersubjectively’ by the participants in the meeting. This is an instance of the creation of knowledge and the creation of understanding, taking place through communication, simultaneously with the enactment of the activities concerned with the knowledge on the site.

The argument to support the value of contextual knowledge as framed by Portwood is as follows. That is that contextual knowledge has practical value and relevance within the activity which forms its context. The argument further supports this practical value over that of abstracted knowledge for which methodologies of enactment must be created.

The process of knowledge creation and knowledge sharing is of course a social communication process actively encouraged by the Site Manager. Therefore a claim can be made for the establishment and development of relationships between the participants over and above that which would normally occur on a construction project. Indeed it is this interrelationship which would support the second finding above: the influence of the ‘Hawthorne Effect’ on the participants. It may also be

claimed that this group relationship influenced the site activities in other ways, but that is not the purpose of this paper.

Accepting the supposition made earlier, that compromises on Health and Safety are continually made by personnel at every level in the construction project, it is also possible to claim that these could be eliminated or at least reduced by this process. If it is accepted that such compromises are difficult to avoid in the 'real world', the 'real world' nature of the discussions on site would consider how best any operation can be carried out. That is, how best in terms of Health and Safety an operation may be carried out.

CONCLUSIONS

The findings of the case study, given all the bounds placed upon them, are encouraging. The accident reports for the site were less than would be expected for a similar project. The reaction of the contractor, Totty, in celebrating this innovation suggests positive support for dissemination of the process throughout the company.

It must be restated that the intention of the publication of all legislation pertaining to Health and Safety in construction must have this in mind: a reduction of accidents and a reduction in reports of hazardous working conditions. Likewise, the research and publications on the enactment and management of Health and Safety must have a similar fundamental aim. But, the intention must go further: not only a reduction in accidents and reports, but an improvement in the working conditions such that the actual experience of operatives on site matches the 'social need' for safe working environments. In other words, the statistics and formal reporting must demonstrate an improvement in conditions, but the conditions themselves, including all the instances which go unrecorded, must genuinely improve.

The authors fully endorse this, and in doing so, examine the purpose of research into Health and Safety in construction. Academic research has the purpose of disseminating information and developing understanding amongst the academic community. But, as we have argued throughout, there must also be a fundamental intention to improve the working conditions of site operative: to create a safer environment. No research would make extravagant claims for large improvements in safety, but all would hope to make some small impact. However, in the course of this paper we have raised the notions of abstracted and contextual knowledge.

Academic research publications have to go through a procedure wherein they are judged by their peers before publication is accepted. This judgement allows the claims made by the publication, the findings and conclusions, to be ratified. This ratification is often dependent on the evidence provided supporting the argument, or stated hypothesis. The supporting evidence will often include statistical data or findings which are representative. However, in the case of Health and Safety, the statistics are unreliable: the change in legal requirements alone makes even medium term comparisons inequitable. Further, the notion of causality – cause and effect - is problematic when examining issues of behaviour.

A further requirement of academic research is the demonstration of transferability or generalizability, that is, if such and such is true in this case, it will be true in all other cases. Such issues of the philosophy of academic knowledge have been raised, and argued against, by Karl Popper amongst others (1982). Without rehearsing these arguments at length, one of the problems of demonstrating generalizability is that the findings and conclusions must be abstracted from the data. In following this course,

much academic research provides little in the way of concrete advice to practitioners in the field: by being appropriate to any condition, there is little to suit any specific condition.

In this paper no claims are made for the generalizability of the findings: they are valid only for the limited case in which they were recorded. Rather, they provide a model which could be acted upon by other practitioners. The advice is simple: follow the steps as described in the case study.

If the first two of the possible reasons for the findings are ‘true’ or ‘valid’ (in whatever meaning may be projected on *those* terms), that the innovation had positive effect, or that the participation in the innovation had positive effect, it is possible that the intended outcome of this particular Health and Safety research may be achieved. In turn, further data could be provided to shed light on the validity of the claims.

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