



Contents lists available at ScienceDirect

Safety Science

journal homepage: www.elsevier.com/locate/ssci

Organizational practices for learning with work accidents throughout their information cycle

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ARTICLE INFO

Article history:

Received 30 March 2016

Received in revised form 17 December 2016

Accepted 19 December 2016

Available online xxx

Keywords:

Organizational learning

Work accidents

Learning practices

Multiple Correspondence Analysis (MCA)

ABSTRACT

Research has acknowledged the relevance of accident information for prevention and learning and the need for companies to develop a reporting and learning culture. Few studies have approached this issue by comparing the different learning strategies used by companies. The aim of this study is to explore how companies use accident information and to develop strategies for learning from accidents, which cover all the learning cycle phases by: (a) identifying learning patterns across company and activity sectors, (b) checking for potential differences among certified and non-certified companies. Seventeen case studies were conducted with organizations operating in different sectors in Portugal. Data was collected from extensive, semi-structured interviews with key stakeholders and an analysis of relevant documentation. All data was subjected to a descriptive analysis, followed by multivariate analysis using Multiple Correspondence Analysis (MCA). The main MCA results showed two dimensions corresponding to the technical and social learning and four patterns were found, each corresponding to different levels of learning practices ranging from the minimal practices used to a higher degree of learning, combining practices of a technical and social nature. Additionally, the results revealed that companies in the same activity sector may have very different practices, independently of OHSAS certification. The results allow us to conclude that organizations with good safety practices tend to follow the complete learning cycle. Overall, these organizations have established procedures to report accidents and to collect information on them but there are organizations that still do not maximize their means of learning from work accidents.

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1. Introduction

The European statistics on accidents at work reveal that their number has been decreasing but is still high, around 2.4 million, leading to around 4500 fatalities (Eurostat, 2013). Considering all the efforts made in developing a European policy and legislation that enforces safety and investments in changing attitudes and behavior, these numbers suggest that the efforts so far are still not enough. At the same time, Europe has been experiencing very difficult times due to the economic crisis and austerity installed in several countries, challenging the sustainability of safety policies.

Cutting safety expenses could be seen as an easy way out for companies to deal with the need to reduce operational costs, despite a century of research showing all the benefits of accident prevention. Improving prevention through accident learning is one way to improve safety outcomes and cut organizational costs due to accidents or safety problems.

There are multiple paybacks in accident prevention and learning from accidents. It is widely recognized (International Labour Organization, 2014) that occupational accidents may have an important impact on productivity and competitiveness. Recent major accidents (e.g., the Fukushima nuclear power plant accident in 2011; the BP Texas accident in 2005; aviation accidents like the Germanwings Flight 9525 in 2015), widely covered by the social media, have had a major impact concerning the respective company's reputation and catastrophic human and environmental costs. It is important to state that these impacts are usually under-

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estimated, for instance the dimension of the impact on the livelihoods of individuals, their colleagues, their families and friends.

The relevance and costs of error and not learning from it has been a critical issue in the medical field. For instance, [Stock et al. \(2007\)](#) have emphasized that medical errors are linked to more than 98,000 deaths annually, and that 58% of these error-related deaths are preventable. In this study the authors stressed the role of organizational culture and critical success factors, like reporting errors without blame, open discussions about errors, or statistical analysis of error data that may lead to a reduction in medical errors. Recently, the [Institute of Medicine of the National Academies \(2013\)](#) presented a report supporting the idea that the path to obtaining “the best care at the lowest cost” requires continuous learning in the health-care systems. Specifically, it stressed that it is possible to reduce costs (excessive costs in Health Care) and at the same time improve the quality of the service. For instance, it has shown that “Missed Prevention Opportunities” represent a cost of 55 billion dollars in this report; inefficiency in the services provided (including those due to mistakes and errors) is estimated to represent 130 billion dollars of excess costs. At the same time several authors have reinforced the idea that learning from incidents can improve both safety and productivity ([Lukic et al., 2012](#)).

In the EU, employers have a legal obligation to prevent work injuries and have risk assessment and management practices in place. Moreover, it has also been stressed that companies benefit from assuring corporate commitment to social, environmental and economic sustainability. Taking into consideration all the examples given above it seems clear that accident prevention and, therefore, learning from accidents, plays a critical role in corporate sustainability. This may help explain the reason why in the past 5 years, several papers have been published that focus on the need to improve learning from accidents and their prevention (e.g. a special issue in Safety Science in 2011, see the editorial by [Carroll and Fahlbruch, 2011](#); [Hovden et al., 2011](#); [Størseth and Tinmannsvik, 2012](#); [Jørgensen, 2016](#); [Gotcheva et al., 2016](#)).

1.1. Organizational learning from accidents

Major accidents with catastrophic consequences have been analyzed by experts or teams of highly trained investigators and, typically, significant lessons can be learned from any single event. Similarly, meaningful conclusions leading to prevention can normally be drawn up from the statistical analysis of aggregated data concerning the “small”, but very frequent, accidents at work. Preventing work accidents, just as any other type of accident, involves learning and decision-making processes that require objective and reliable information. To be effective, they should be the final step in a deep-rooted continuous learning process, rather than just the result of isolated corrective measures.

According to [Jacobsson et al. \(2011\)](#) organizational learning can be any type of learning where the organization increases its ability to perform its activities better which, in this context, means performing them safely or at least more safely. Organizational learning can include technical matters (e.g., replacing a piece of equipment for another of better material), procedural matters (e.g., improving an operating instruction), and personnel matters (e.g., increasing the competence of the operators through more training).

Organizational learning literature has a long history and a large body of contributions. With the intention of organizing these contributions [Easterby-Smith and Araujo \(1999\)](#) suggested a characterization that contemplates the type of processes under consideration. These authors called them: technical and social processes. The technical perspective stresses that learning requires effective information processing, interpretation and its respective

response/consequences. An example of these approaches is the work of [Argyris and Schön \(1978\)](#), as it concerns the single-loop and double-loop of learning. The social perspective, on the other hand, focuses on the way people make sense of their experiences at work and stresses the role of social interaction processes in learning. Approaches with this perspective either consider the learning as a social construction process, or as a political process, or as a cultural artifact. The latter considers that learning is a social process embedded in the organizational culture (not only within the heads of the individuals). An example is the work of [Lave and Wenger \(1991\)](#) about situated learning, which was later on extended to the concept of Communities of Practice ([Wenger, 1998](#); [Gherardi and Nicolini, 2000](#)). For instance, patterns of behaviors learned during social interactions as an example of the behaviors that are learned by newcomers during socialization. Together, the two perspectives, i.e., technical and social, suggest three key assumptions about what groups need in order to learn from an event: (1) information about the event; (2) opportunity to share points of view about the event; (3) acquisition of new knowledge.

The proposals mentioned above address organizational learning in general. In an effort to apply these perspectives to the specific domain of safety, [Silva and Lima \(2005\)](#) suggested 4 types of strategies for interventions that support learning (technical and social) from accidents: diffusion, discussion, training and change. “Diffusion” refers to the dissemination of accident information. “Discussion” goes a step further and includes an exchange of views on the information about the accident. “Training” corresponds to the use of accidents to improve workers’ safety training. “Change” implies the organizational act of modifying something after an accident (e.g., changing rules, technologies, supervision, etc.). Each of these four strategies can be applied to the whole organization (global) or only to a sector or department (local).

Another approach relates learning to organizational culture. Namely, it has been strongly recommended that organizations should develop a reporting culture and that a learning culture therefore becomes part of the organization’s safety culture ([Reason, 1997](#)). A reporting culture stresses the importance of retaining knowledge obtained from small accidents and near misses; a just culture is one that allows errors and mistakes to be reported and in which everyone knows where the line must be drawn between acceptable and unacceptable actions; a learning culture means that the information is available, disseminated, discussed and changes are implemented. Moreover, [Reason \(1997\)](#) stresses that learning implies observing, reflecting, creating and acting. The relevance of “just cultures” has continued to be studied and developed; particularly noteworthy is the work of [Dekker \(2007, 2009\)](#) and [Dekker and Breakey \(2016\)](#) who stresses the importance of maintaining a balance between learning from incidents with accountability for their consequences.

More recently, [Littlejohn et al. \(2014\)](#) analyzed literature focusing on the issue of the alignment between learning and safety culture in organizations. Their work constitutes an important milestone in understanding the complex interrelationships across safety culture and learning culture. The authors identified six aspects from the literature, that were fully aligned with safety and learning cultures: open communication (multiple open channels of communication to allow effective information flow), employee empowerment (organizations empower employees to exercise their ability to actively engage in learning), collaboration (opportunities for collaboration, within and outside the company and opportunities for individuals to develop teamwork skills), alignment between espoused and enacted priorities (espoused priorities for learning and employees’ learning behaviors are aligned), management (managers have the commitment and competences to support learning) and internal systemic alignment (internal

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