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Safety training in context: technical, cultural and political factors affecting its design, delivery and transfer

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ABSTRACT

Introduction: Safety training is integral to modern safety management systems. However, what is trained in the classroom is not always adopted and applied in the workplace, creating the training transfer problem. Taking an alternative ontological stance, the aims of this study were to conceptualize this problem as one of 'fit' between what is trained and the contextual factors in the work environment of the adopting organization. *Method*: Twelve semi-structured interviews were conducted with experienced health and safety trainers having diverse backgrounds and experience. Data were thematically coded 'bottom-up' to capture reasons for safety training and where consideration of context occurs in the design and delivery of training. Then, the codes were thematically grouped against a pre-existing framework to categorize contextual factors that affect 'fit' into technical, cultural, and political factors each operating at different levels of analysis. *Results*: Safety training occurs to satisfy external stakeholder expectations and meet internal perceptions of need. Consideration of contextual factors can occur both in the design and delivery of training. A range of technical, cultural, and political factors were identified, which can operate at individual, organizational, or supra-organizational levels to influence safety training transfer. *Conclusions*: The study draws particular attention to the influence of political factors and the impact of supra-organizational factors on the successful transfer of training, areas not consistently considered in safety training design and delivery. *Practical Application*: The application of the framework adopted in this study provides a useful tool for discriminating between different contextual factors and the level at which they operate. This could enable more effective management of these factors to improve the potential for transfer of safety training from the classroom to the workplace.
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1. Introduction

Safety training is an integral and important part of modern safety management systems (Casey, Turner, Hu, & Bancroft, 2021) and aims to render staff competent to work effectively and safely. A recent meta-analysis of workplace safety interventions has shown that safety training improves both safety compliance and safety participation (Hutchinson, Luria, Pindek, & Spector, 2022). Crucially, the success of classroom-based training depends on the application of the lessons learned in the workplace (Ford, Bhatia, & Yelon, 2019). This is captured in the concept of transfer, which Ford and Weissbein (1997) define "as the extent to which knowledge and skills acquired in a training setting are generalized and maintained over a period of time in the job setting," p.34. However, while success depends on the effective application of what is learned in the workplace (Ford et al., 2019), this is not always achieved for a variety of reasons, creating the commonly reported 'training transfer' problem (Baldwin & Ford, 1988; Burke & Hutchins, 2007).

Transfer of safety training is acknowledged to be often problematic (e.g., Namian, Albert, Zuluaga, & Behm, 2016; Albert & Routh, 2021). According to a recent review by Chen, Ping, Zhang, and Yi (2022) who used a bibliometric method to map three related, but increasingly specific, groups of literature (namely training transfer, safety training and safety training transfer), there is a relatively small number of studies (n = 44) that have investigated safety training transfer. Nevertheless, these studies show that safety training transfer is affected by three high-level groups of factors: characteristics of the trainees (e.g., motivations, self-efficacy and ability); safety training design, specifically content and methods; and working environment, in particular opportunities to apply the training, the organizational climate and social support. Aligned

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with the earlier work by Hofmann, Burke, and Zohar (2017), Chen et al. (2022) indicated that urgent attention is warranted to identify those factors and their interrelationships that affect safety training transfer, suggesting that safety training transfer remains an important topic for further investigation.

Safety training differs from conventional training, with these differences creating unique challenges that hamper the successful transfer of safety training. Casey et al. (2021) drew attention to four such differences. First, safety training is often mandated, which can diminish individual choice, self-determinism, and engagement. Second, when safety behaviors become a normative obligation and regulated, workers might resist safety training programs. Third, often safety training programs are seen as redundant or irrelevant, reducing motivation. Training having only a compliance focus is especially vulnerable to this challenge as it becomes neither meaningful nor memorable (Dvorak, 2021). Finally, some safety training may only be practiced in an emergency, leading to a decay in expertise due to a lack of practice.

In an earlier review of training transfer, Ford and Weissbein (1997) noted that transfer effects can be examined at levels beyond the individual, suggesting that training transfer is a multi-dimensional phenomenon with multi-level influences (Burke & Hutchins, 2007; Sitzmann & Weinhardt, 2018) in need of further conceptual development (Ford et al., 2019). Adopting a different ontological stance on training transfer from the dominant psychological orientation of much of the training transfer literature, an alternative conceptualization of training transfer may be found in the notion of 'fit.' This is defined as, "the degree to which the characteristics of a practice are consistent with the (perceived) needs, objectives and structure of an adopting organization" (Ansari, Fiss, & Zajac, 2010; p68). Where the characteristics of a trained practice, including its content, better 'fit' the workplace environment and the context in which it is subsequently applied, then the transfer of what is learned becomes more likely.

Baldwin, Ford, and Blume (2009) indicated that trainees needed to customize their training to fit their job situation, while Grossman and Salas (2011) observed that employees increasingly required mutable skills so that workers were capable of adapting to specific environments. More recently, in their dynamic model of training transfer, Blume, Ford, Surface, and Olenick (2019) indicated that contextual factors influence transfer, and that individuals must tailor their transfer of new skills to the particular characteristics of their work environment. Consequently, generalized off-the-shelf training products may be ineffective because they do not consider local contextual factors. Casey et al. (2021) observed that "many safety training programs are designed as a one-size-fits-all solution," p307, suggesting that the audience needs, and work environment characteristics often are not considered, which, in turn, impedes the adoption and effective implementation of trained safety practices.

Additionally, the role of trainers in the transfer of training from the classroom to the workplace is vital, significantly influencing the design and delivery of training interventions (Burke & Hutchins, 2007). Acknowledging this vital role, several studies (Freitas & Silva, 2017; Freitas et al., 2017; 2019) have addressed the influence of safety professionals employed by organizations, including training as part of their job role, on safety training transfer. However, classroom-based safety training may also be designed and delivered by others operating independently and providing training to a wider range of different organizations. Their experience appears to be unreported.

The aims of this study were therefore to draw on the experience of safety trainers, who have acted with both in-house/internal and independent/external training roles, to investigate safety training transfer from an alternative ontolological stance using the concept of 'fit' and identify and categorize coherently the breadth of contextual factors operating at different levels that influence it. Specifically, the study aimed to address three questions:

(i) What purpose does safety training in organizations serve?
(ii) Where in the design and delivery of classroom-based safety training is context considered?
(iii) What contextual factors operating at different levels affect the 'fit,' and therefore likely adoption, of a trained safety intervention or practice in organizations?

Based on the premise that to achieve 'fit,' safety training needs to take account of the variety of organizational contextual factors in both the design and delivery of the training, 12 experienced health and safety trainers were interviewed. Following a review of relevant theories and studies in the following subsections, details of the methods and the findings from these interviews are presented, respectively, in sections 2 and 3 of the paper. Important contextual factors operating at different organizational levels that have important practical implications are considered in the discussion (section 4). The conclusions in section 5 draw attention to the influences both of contextual factors beyond the organization and the political nature of organizations on safety training transfer.

1.1. Training transfer and safety training

The success of classroom-based training depends on the effective transfer of learning from the classroom to the workplace (Cheng & Hampson, 2008), for "... much of what is trained fails to be applied in the work setting" (Ford & Weissbein, 1997, p22). This requires the transfer of training from one situation to another, which Salas and Cannon-Bowers (2001, p.488) conceptualize as the "... extent to which knowledge, skills and attributes (KSAs) acquired in a training program are applied, generalized, and maintained over some time in the job environment," echoing Ford and Weissbein (1997) earlier definition.

Generalization and maintenance are vital aspects of the conditions of transfer indicated in Baldwin and Ford (1988) original model of training transfer. Generalization considers the extent to which knowledge and skills are not simply learned but positively applied to settings, people, or situations different from those trained (Ford & Weissbein, 1997). This requires learners to tailor, or adapt, what they have learned to respond to variations in the context in which the learning is to be applied (Blume et al., 2019). Maintenance relates to preventing the degradation of skills and refers to the extent to which the changes arising from the training persist over time (Blume, Ford, Baldwin, & Huang, 2010), which is clearly contingent upon adoption. As both aspects of the conditions of transfer are influenced by context, Barnett and Ceci (2002) concluded that training transfer is highly contextualized. Although Baldwin and Ford (1988) indicated that the impact of context on training transfer could be examined empirically from a levels-of-analysis perspective, there appears to have been little or no response to this suggestion.

Over time, several literature reviews have identified factors influencing the transfer of training (e.g., Ford & Weissbein, 1997; Burke & Hutchins, 2007; Grossman & Salas, 2011). These studies mainly emphasize the importance of trainee characteristics, training design, and work environment as key groups of factors that affect the transfer process. Within these broad areas there are several notable themes. Trainee characteristics include their cognitive abilities and motivation, and perceptions of utility (e.g., is the training worthwhile?). In some studies (e.g., Burke & Hutchins, 2007; Grossman & Salas, 2011; Taylor, Russ-Eft, & Chan, 2005), training design includes role modeling behaviors and error management, whereas Baldwin and Ford (1988) refer to principles of learning and training content. Work environment includes the sup-

port available for transfer and the opportunity to perform the new task. Baldwin and Ford (1988) state that empirical evidence for the factors in the work environment affecting training transfer is sparse, a point reinforced by Brown and McCracken (2009). Lancaster, Di Milia, and Cameron (2013) concluded that of the three groups of factors affecting training transfer, the work environment had received the least attention. These three key groups of factors also pertain to safety training transfer as demonstrated in the review by Chen et al. (2022), although the supporting empirical evidence for the influence of work environment on transfer of safety training was sparse and mainly limited to the transfer climate, principally support by various others, and the safety climate more specifically.

An integrated model of the factors that influence safety training transfer was developed by Casey et al. (2021) based on a review of 38 articles from the safety training literature published between 2010 and 2020. This identified safety training engagement as a key, previously underexplored concept in learning and subsequent safety training transfer. Transfer of safety training was influenced by safety training design factors, safety training delivery factors and pre-training factors, and different facets of context were indicated to influence each of them. The model of Casey et al. (2021) also indicated that safety training transfer was affected by the opportunity to apply what was learned. Although context was indicated to influence the opportunity to apply, this was not the focus of the model, leaving this post-training relationship between different levels of context and application relatively underspecified.

1.2. Training transfer and the concept of 'fit'

The transfer of training involves the application of knowledge and skills acquired in a training program in the workplace (Salas & Cannon-Bowers, 2001). Often this knowledge and these skills are embedded in tools, techniques, and practices. These may or may not be immediately applicable in the workplace, and consequently may require adaptation to fit a specific work context (Blume et al., 2019). Identifying the contextual factors in the work environment operating at different levels of analysis that affect the opportunity to apply tools, techniques, and practice in the workplace is vital for successful training transfer. A primary aim of many safety training programs is the improvement of safety performance through the education of employees in the use of new tools, techniques, and practices and their subsequent adoption throughout the organization. According to Damanpour (2014) "the main challenge associated with [such] management innovations is in their successful adaptation and assimilation," p1271. This is a manifestation of the problem with training transfer, but from a sociological perspective rather than the psychological one that underpins much of the discussion of training transfer.

The concept of 'fit' defined above as "the degree to which the characteristics of a practice are consistent with the (perceived) needs, objectives, and structure of an adopting organization" (Ansari et al., 2010; p68), captures Damanpour's 'main challenge.' Where trained tools, techniques, and practices can be adapted to meet local needs (if they do not already do so), interventions are more likely to be assimilated, adopted, and applied. Where this is more difficult or unachievable, the trained interventions are less likely to be adopted and the knowledge and skills inherent in these interventions will not be transferred. Ansari et al. (2010) report that this concept of 'fit' is rarely considered, but is likely to be influenced by technical, cultural, and political factors in the work environment, and that these differ by level of analysis.

Incompatibilities between the trained practice and the context represented by technical, cultural, and political factors (Oliver, 1992) can affect adoption and may occur at individual/intra-organizational, organizational and supra-organizational levels (Ansari et al., 2010). Technical fit describes the extent to which characteristics of the trained practice or intervention are consistent with the technologies available in the new situation. At the intra-organizational level, this includes the technical background and experience of the employees, while organizational innovativeness and industry standards illustrate potential sources of incompatibility at organizational and supra-organizational levels, respectively.

Moreover, the beliefs, values, and working preferences of employees affect the transfer process as does the organizational culture and normative sector level discourses (Ansari et al., 2010; Gray, Purdy, & Ansari, 2015). Respectively, these illustrate cultural sources of potential incompatibility between the original practice and the new setting at the three different levels mentioned above. Finally, trained interventions embody a set of normative characteristics that may or may not be compatible with the local interests and agendas of adopters. This corresponds to the political fit (Ansari et al., 2010). Interests of individuals and groups within organizations may serve either to support or block the acceptance of new or revised practices arising from training initiatives (Damanpour, 2014). Similarly, factors such as government regulations or union agreements can influence adaptation and adoption at the supra-organizational level (Wijen, 2014).

Some of the technical, cultural, and political factors that generally influence 'fit' have been shown to affect the adoption of new knowledge and skills following safety training. For example, Demirkesen and Arditi (2015) demonstrated that safety training transfer is more likely in older, larger construction companies. Westrum (2004) showed the influence of organizational culture on the prioritization and management of safety, and therefore, the likelihood of successfully and effectively transferring learning and deploying trained safety interventions. Vignoli, Mariani, Guglielmi, and Violante (2018) investigated the influence of self-efficacy and leadership on the transfer of technical and non-technical skills for safety. Differences in perceptions of safety between different groups within organizations have been shown in the nuclear industry by Rollenhagen, Westerlund, and Näswall (2013) and by Gao, Bruce, and Rajendran (2015) in aviation, creating different responses to new safety interventions.

2. Methods

2.1. Participants

Consistent with a realist ontology the authors sought to access the 'reality' of safety training and the associated challenges of training transfer through conversations with experienced informants. 'Experience' is defined here as having more than 10 years practical experience of working in or for organizations, in at least two difference sectors, including international experience, to design and deliver safety training in the classroom to participants, ranging from front-line workers to board members, for both non-qualification and qualification purposes, and the latter to different levels.

Based on a convenience sampling strategy from the network of contacts available to the authors, 12 individuals agreed to participate in this study. Some of their demographic details are provided in Table 1. The sample included an academic from a university different to the authors' affiliation, a chief medical officer, two independent Health and Safety (H&S) training consultants, three directors of H&S training and advisory companies, three senior figures in internationally recognized providers of H&S training, and two senior staff from industry bodies supporting process safety.

Participants were based and worked in the UK, United States, Australia, the Netherlands, and Malaysia. There were five female and seven male participants. They had training expertise in both

Table 1
Demographic details and experience of the trainers interviewed.

Respondent Number	*Sex*	*Nationality*	*Experience (yrs)*	*Role when interviewed*
I1	Female	American	>10	Senior director workplace H&S training – international professional body
I2	Female	American	33	Senior H&S consultant and trainer – international professional body
I3	Male	British	26	Consultant – formerly H&S Director
I4	Male	Dutch	20	Consultant / Academic
I5	Female	British	>20	Director – Independent training company specializing in H&S
I6	Male	British	18	Head H&S Training design and development – international professional body
I7	Male	British	14	Academic
I8	Male	British	22	Chief Medical Officer
I9	Male	British	>15	Director – Independent H&S Training company – design and delivery behavior-based H&S training
I10	Female	Australian	>15	Director and H&S training designer – Industry body
I11	Male	German	>10	Global QHSE Manager – Global independent safety advisory company
I12	Female	Hungarian	>20	H&S Training director and designer – Industry body

process and occupational safety. Collectively, the interviewees had experience mostly in the private sector across a wide range of industries, including construction, oil and gas, nuclear, manufacturing, pharmaceuticals, health care, transport, telecommunications and entertainment. They had been delivering training at different qualification levels, ranging from vocational/undergraduate certificates through to master's degrees. The participants had also extensive experience in delivering continuing professional development courses to both front-line employees and senior management of organizations in both open program and in-company formats. All had considerable experience of observing the deployment of safety interventions in a range of organizations.

Through interviews, the authors sought to clarify the contextual parameters related to the design and delivery of classroom-based safety training and determine those factors operating at different levels of analysis that influence the subsequent adoption of the training in practice. Using experienced key-informants makes it more likely that consensus on important themes will be achieved more quickly, while simultaneously surfacing the breadth of important issues (Guest, Bunce, & Johnson, 2006). Those authors concluded that 'saturation' had occurred within the first 12 interviews from a sample of 60 interviews. Chionis, Karanikas, Iordan, and Svensson-Dianellou (2022) reached saturation after interviewing only 10 experienced safety investigators in their study of risk perceptions and communication in the aviation industry.

2.2. Data collection

An interview protocol (Appendix A) was shared with the interviewees in advance to allow them preparation time, secure considered responses, and strengthen data reliability and comparability. Following the collection of demographics (Question 1), the participants were asked about the consideration of context in the training they deliver (Question 2). Questions 3 and 4 were conditional to the responses to Question 2 and regarded how context is considered in training or why it is not considered, respectively. Question 5 aimed at collecting the overall experiences of the interviewees about the extent to which H&S training considers context, and Question 6 was about the perceived effects on organizational performance should context was considered in safety training programs. Last, the participants were prompted to list contextual factors (Question 7) and then specific organizational factors they believed could affect safety intervention effectiveness (Question 8).

The interviews were conducted online during August 2021 via Zoom by a single researcher to avoid interviewer variability in data collection. Eleven interviews lasted between 41 and 59 minutes, and one extended to 1.5 hours, accumulating to almost 10 hours of conversations. The interviews were audio recorded using the facility in Zoom. Transcription of these files was outsourced to a transcription service. Intelligent verbatim transcripts of each interview were cross-checked with the audio-recording and proofread by the first author to correct punctuation and misspelled or missing words as recommended by McMullin (2021).

2.3. Data analysis and reporting

All the transcripts were read by the lead author twice before coding commenced to get an overall sense of the available data. These qualitative data were analyzed using a form of thematic analysis, which is a widely adopted "method for identifying, analyzing and reporting [themes] within data" (Braun & Clarke, 2006; p.79). Initially, each transcript was free coded using the language of the informants into first order codes. The resulting first order codes from each of the 12 interviews were then collated.

Two alternative approaches to the subsequent coding of these free codes and analysis of the qualitative data were then deployed. First, following a form of template analysis outlined by Gioia, Corley, and Hamilton (2012), other first order codes from the 12 interviews relating to the purpose of safety training and where context was considered in the design and delivery of training were then combined through axial coding into second order themes that were labeled using more generic terms. These second order themes were then merged into two higher level aggregate dimensions.

Second, based on a reading of Ansari et al. (2010), first order codes that identified contextual factors that influenced the adoption of a practice in an organization post-training were categorized as technical, cultural, or political, and then were further differentiated depending on the level of their effect: individual/intra-organizational, organizational and supra-organizational. This allowed the authors to create a 3x3 matrix of different types of contextual factors operating at different levels of analysis that influence the transfer of safety training.

Following an approach for the analysis of qualitative data reported by others (e.g., Zott & Huy, 2007; Jimmieson, Bergin, Bodia, & Tucker, 2021) the coding and grouping into themes was conducted by the first author. The second author then checked the text-code and code-theme correspondences provided by the first author. Any disagreements were resolved by referring to the data collected, and the codes generated.

As, to the best of authors' knowledge, this is the first study to investigate the contextual factors that influence the 'fit' between safety training and subsequent practice, the authors did not aim to present the magnitude or prevalence of the findings. Instead, the goal is to qualitatively offer a first, but representative, understanding of the landscape as an avenue to raise awareness of the

Table 2
Coding structure for data analysis.

1st Order Codes	2nd Order Themes	Aggregate Dimensions
General compliance	Meet external expectations	Aim of training / Driver for training
Improvement notices		
Audit results		
Social pressure		
Acquisition of skills	Internal perception of need	
H&S data		
Sense of unease		
Bottom-up innovation		
Approval process	Design process	Incorporation of context in training
Customize / Standardize		
Case study	Delivery modes	
In-Class discussion		
E-learning		
Competence of employees	Intra-organizational	Technical characteristics
Individual attributes		
Existing processes	Organizational	
Size of organization		
Regulatory context	Supra-organizational	
External standards		
Sector business models		
Societal challenge		
Management support	Intra-organizational	Cultural characteristics
Reporting lines		
Organizational culture	Organizational	
Voice		
National / societal culture	Supra-organizational	
Leadership beliefs / values	Intra-organizational	Political characteristics
Group-sub-group dynamics	Organizational	
Employee relations		
Competing priorities		
Unionization	Supra-organizational	
Legal context		
Sector level sharing		
State orientation towards H&S		

industry and stimulate broader studies, possibly including quantification.

3. Findings

The coding and theme structures that emerged from the data are presented in Table 2. The findings discussed in this section synthesize the responses from different individuals in correspondence with the respondent number (Table 1) and supported with verbatim quotes.

3.1. Why training?

The analysis suggests that there are two responses to this vital question (Table 3). First, training is implemented to meet the expectations of an external stakeholder. Where changes to legislation or regulations are introduced, then changes in practices may follow that necessitate training in the new practice. In contrast to these general requirements that affect all businesses, specific requirements may be placed on an organization following an audit or an inspection that may have arisen following an incident. Changes to current practices may require training. However, it was noted that in some cases training was an end in itself: "*It can be the case that training is just a way to say, 'Oh, we have done everything we can'* (I4)." It simply demonstrated to a third party that an organization had responded to a particular issue.

Second, training is implemented to meet internal perceptions of need. These may arise either from an inspection of health and safety data, which indicate that improvements are needed, or from a sense of unease that something needs to be done. These may be driven top-down in the organization and can often be implemented hastily or without sufficient consideration of the possible consequences. In one example given by an interviewee, the CEO of a company issued an edict that all platforms for working at height should be fitted with protection cages following a crush injury to a worker using this equipment. The unavailability of these cages in the African countries where this company operated meant

Table 3
Illustrative quotations of first order codes evidencing the different aims or purposes of safety training.

Illustrative quotes	1st Order Codes	2nd Order Themes
"It's what are you legally required to do, to maintain your license to practice as a business" (I8)	General compliance	Meet external expectations
"an intervention driven off the back of the regulatory intervention, an organization that's either had an accident or its been prosecuted, or it's been served an improvement or a prohibition notice" (I3)	Improvement notices	
"And [Organization] had a safety culture audit done a couple of years ago, and it was really bad. It looked like things were terrible. So I think [person] was under a lot of pressure from the manager to get something out there as quickly as possible (I7)".	Audit results	
Imagine you're in an organization that has a lot of sickness absence. A lot of it is around stress. Does putting mental health first aid in place help you with the problem? No, it doesn't. But it seems like an easy thing to do in order to look like you're doing the right thing (I5)	Social pressure	
"But then improvement in the image, the brand value on reputation, everyone saying you can see we are committed, you can see the health and safety policy (I11)"		
"there is a direct correlation between what they want to achieve [i.e. well-being of staff], the training that's delivered, and then the follow-up to show whether actually that was taking place or not" (I5)	H&S data	Internal perception of need
"[The client] will say, why should I? What's the return on investment? So, you need data. This very much drives what we do to be able to say, if you have an early intervention programme ….you will get people back 35 days earlier" (I8).		
"an organization feels insecure, it doesn't have the knowledge, it doesn't know where to start (I7)"	Sense of unease	
"They ended up doing safety management system assessments with us because they asked for training, but that really wasn't their issue, but to the untrained eye and to someone who is not really in safety, they might be in a leadership position, they feel like training is the go-to (I2)"		
"the training is to make people able to improve their work and safety and health at work, so they have to change their habits, or they have to maybe initiate improvements in the workplace (I4)"	Acquisition of skills	
"more often than not is that interventions are designed from the top-down and not from the bottom-up, and we need to get better at designing interventions with involvement from the people at the lower levels, because we'll end up with much better sustainable interventions (I3)"	Bottom-up innovation	

Table 4
Illustrative quotations of first order codes evidencing where considerations of context occur in safety training.

Illustrative quotes	1st Order Codes	2nd Order Themes
"So, when we develop a product, first thing we do is we talk to employers because they are really the kind of the end user in lots of way, they are the people who reap the benefits otherwise. So, we always talk to employer groups (I6)"	Approval process	Design process
"we brought in 12 very senior health and safety practitioners from their organizations and said, sense-check this syllabus. You go through it line by line (I6)"		
"We do empower people to bespoke the learning to their audience and that's what sets a good course apart (I6)"	Customize / Standardize	
"from the context in a private course, that really does – like the course is built around the organizational context and cultural norms, and, you know, I really make sure that I try and address what their symbols of leadership are (I10)"		
"you have to make decisions because you have the role, you have the role as an operator or supervisor or emergency manager depending on the theme of the case study, and then you discuss with your colleagues. It's a team exercise (I12)"	Case study	Delivery modes
"as you start a course or a class and people introduce themselves, you get a feel for who they are and where they are, and then they also talk about what they were hoping to get out of coming to us for this particular course, and the ability sometimes to take a little detour, one way or the other, in order to meet somebody's learning goal (I2)"	In-Class discussion	
"You can also use e-learning as a very standardized way of giving knowledge in a cheap way (I4)"	E-learning	

Table 5
Illustrative quotations of first order codes evidencing technical factors that influence 'fit' at different levels.

Illustrative quotes	1st Order Codes	2nd Order Themes
we need to stop just looking at people's technical abilities as well and start looking at their other skill sets that they've got when we're promoting people into certain positions at work (I6)	Competence of employees	Intra-organizational
Generally, the most important is employees' competence level. You know, occupational health and safety training, you can't just throw it into your company and say, okay, fine, because competence level between, let's say, a manager and supervisor and, let's say, for floor staff are totally different (I11)		
Demographic. Male/female, educated/uneducated (I5)	Individual attributes	
It is around people being decisive when they need to be, but also realizing when they need to listen, and having that level of self-awareness. And so, when you see people realize that actually self-awareness is going to help them through this if it happens to them, that can be really quite useful. (I10)		
I think another one of the issues that we have in terms of our interventions, they tend to be separate processes, as opposed to maybe trying to integrate your intervention with existing processes in a business (I3)	Existing processes	Organizational
I think with smaller organizations, they sort of pick and choose, and borrow and get and '-ize' it to their organization as far as [the] words around things that are specific to [their] industry, but maybe not necessarily around specific needs or competence or outcomes, at least (I2)	Size of organization	
Also, what's the regulatory territory that you're in, as well, because obviously, with any intervention that you do, you will have to keep an eye on what your country regulatory is saying about in terms of guidance, laws or codes of practice. Also, in fact, actually industry standards as well (I3)	Regulatory context	Supra-organizational
If you're thinking about doing an intervention, are there any industry standards that are relevant to this that I need to be aware of (I3)	External standards	
then there's the third bit, which is the discretionary spend, what's nice to have. And dependent upon whether its public sector/private sector or anything, their outlook on what that is, is completely different (I8)	Sector business models	
In the low middle-income countries, the driver is not so much the risk-based health and safety approach, it is public health. How do we keep out employees alive, so that they can actually come to work (I8)	Societal challenge	

that all work using these machines was halted there, even in situations where crush injuries were impossible. In this example, the situation was resolved subsequently by the introduction of changes to risk assessments. Alternatively, changes to practice were considered to be more effective when initiated bottom-up, because there was ownership of these changes, and the subsequent training was relevant.

3.2. Where is consideration of context given in safety training?

The interviewees noted that training can be used to provide knowledge and skills, which may not require consideration of context, or to support implementation, application or organizational change, which does require a consideration of context. Training may be used simply as a vehicle to communicate and deliver information that needs to be remembered rather than to provide skills required to interpret the information in different settings.

The analysis suggests that interviewees were unanimous in their view that consideration of context was important in safety training and would make a difference to safety outcomes. It also showed that context is considered at two points in the delivery of training (Table 4). The first point is at the design stage. Training courses can be standardized products, which contain little or no consideration of context. Standardization allows effective quality control and ensures a known content. The selection and choice of training is occasionally made by those with little or no knowledge of the products purchased or the setting in which they will be applied. Moreover, they are often seeking the cheapest rather than the most effective option.

> "It's one size fits all because of budget constraints or whatever, that's the way it's delivered (I1)".

Table 6
Illustrative quotations of first order codes evidencing cultural factors that influence 'fit' at different levels.

Illustrative quotes	1st Order Codes	2nd Order Themes
the resistance comes a bit further down, once you start hitting those middle managers who are less convinced about the need for the intervention or whether it's going to work (I3)	Management support	Intra-organizational
I remember also a case where people said, well, the most important danger in my job is my boss. So, then you have to do something about the boss, or you have to start communicating with the boss and it is also important that the people and the boss develop a new kind of conversation among them. It may take quite some time before it happens So, yeah, that is also context (I4)		
So, if we're training someone on a particular safety topic and that safety function within that organization reports to a vice-president or to the CEO, you're probably going to have a better chance of that being implemented than if that safety person is a lower-level person or perhaps reports into HR or into finance, for example (I1)	Reporting lines	
It sounds lazy, but obviously culture is the golden bullet (I6)	Organizational culture	Organizational
Understanding that the environment in which someone is working will determine what action they are likely to take in any given scenario . . . whether it is the cultural environment that they're in, in how they're encouraged, supported, do they have that level of psychological safety to be able to speak up (I10)		
It's all very lovely to say, you know, you have the power to stop the plant. And I get a lot of people telling me that in the training courses, I say okay that's great, when was the last time someone did it? Well, they have never done it. Well, why do you think they have the power to do it then if they've never done it? (I10)	Voice	
what is fundamental is actually to understand the country and their culture and religious behaviours (I11)	National / societal culture	Supra-organizational

Table 7
Illustrative quotations of first order codes evidencing political factors that influence 'fit' at different levels.

Illustrative quotes	1st Order Codes	2nd Order Themes
I would get a sense of where the leadership are in terms of attitudes and behaviors towards safety (I3)	Leadership beliefs / values	Intra-organizational
There are so many other factors that have to be considered, such as what's the leadership's stance on [safety interventions] (I1)		
there are some things that will influence whether it's likely to be more or less effective, for example, you might have a top – a senior leadership team that is supportive or you might have a senior leadership that isn't supportive (I12)		
Having a leadership team who will listen, not accepting those unsafe behaviours, but also understanding why these unsafe behaviours take place (I6)		
So how you can build capability in that particular site, which is in line with the corporate culture, the corporate view and vision and it may be the other way around as well because maybe the corporate is doing really, really like not so well or their safety culture doesn't show really big commitment towards safety, but they have really brilliant sites. And then it's the opposite. (I12)	Group-sub-group dynamics	Organizational
the social interactions in the group that can also be important. Sometimes there is a strong subculture in a group. It is difficult to influence by leaders even (I4)		
of course, ultimately, it's about what's the relationship then with the employees, the organizational relationship with the employees. That's quite the key as well. (I3)	Employee relations	
there are competing priorities at the supervisory level in particular, that's where it becomes a lynchpin and a stopping point. So, understanding what else the organization is trying to do simultaneously (I1)	Competing priorities	
The Trade Unions are in context are very important influencer. And you ignore them at your peril. (I8)	Unionization	Supra-organizational
First of all, it needs to be understood what are the differences between developing and developed countries in their legal system, in occupational health and safety, environment (I11)	Legal context	
I recently had nuclear experts attending a course because they wanted to apply some learning from process safety into nuclear safety. So that is one aspect that sectors are breaking down those wall and they are not working anymore in silos (I12)	Sector level sharing	
Then you come to the developed countries. Two ways to split them up is what I call the UK-US approach and the European approach. It is the punitive bullish approach and the caring nanny-state approach (I8)	State orientation towards H&S	

Conversely, rather than delivering generic materials, because "*H&S training without context is pointless (I12),*" the interviewees acknowledged that the needs of the client organization are better met by adapting or modifying existing training materials or creating new content. This involves a consideration of context.

> "So, your aspect of context is really fundamental in that. And the mistake to go to a client is to say, we think you should have this (I8)".

Developing training materials in collaboration with employees in the organization ensures that feedback is immediate and continuous, so that improvements can be made quickly. The approval process surrounding the development of a course or program can also have a profound influence on the content and delivery of materials. The interviewees noted that, in some cases, courses may be designed only by learning and development professionals without the involvement of H&S professionals. In other settings, courses may or may not have industrialists approving the content to evaluate the relevance of the materials to the practitioners participating in the course.

The second point is at the delivery stage. In the classroom, trainers draw on the experience of delegates or their own examples. This is prevalent in open programs with delegates coming from different organizations and where there is "*lots of context on the fly (I2).*" Similarly, discussion of 'war stories' (i.e., sharing of lived experiences in organizations) may also occur during the delivery of in-company programs too; in some cases, this may be an integral part of the design. These discussions allow questioning, which promotes understanding for the learner. Incomplete understanding reduces the chance of application subsequently and provided the

basis for a critique of on-line learning. The *"complaint about online training . . . there is no place for someone to ask a question. There's no doubling back to see if that person can actually apply the skill set (I1)."* eLearning is an alternative to classroom-based training. While it was identified "*as a very standardised way of giving knowledge in a cheap way* (I4)," it was noted that the standardization of the product prevented a consideration of how the materials might be applied in context:

> "They leave you with the feeling, 'Okay, so now what?' When I finish the training course how can I apply it in my daily work? (I12)".

Some trainers, particularly from professional bodies, were strong advocates for the use of case studies. These allowed delegates to be involved in the unfolding decision making that led to the outcome illustrated in the case study. "*The way we present the case studies are that you go through the story as it unfolds itself. It starts not from the accident; it starts way before the accident occurred. Then you go through the story, what happened and what further information you receive (I12).*" This allows for an exploration of the influence of context on application, and so the scope for transfer.

While context was considered at these two points, many of the interviewees felt that context was generally overlooked, or at best left implicit, rather than being made explicit. With a sense of exasperation, one of the trainers remarked *"One of the things that I find so frustrating is actually when people don't recognize the context that they are in, and that that has an impact on what's going on (I10),"* while another observed that *"We assume people think about context – but they don't (I7).*".

3.3. Important contextual factors influencing safety interventions

The analysis revealed that interviewees collectively identified many contextual factors that influence the implementation of a safety intervention following training and that need to be considered during the design and delivery of safety training. One respondent understood, "*that something isn't just 'this is what it is' and we go plunk it into an organization, and it just works beautifully every time and it works the same way every time. There are so many other factors that have to be considered (I1).*" These factors have been classified into technical, cultural, and political factors operating at different levels of analysis using the framework developed by Ansari et al. (2010).

3.3.1. Technical factors (Table 5)

At the intra-organizational level, employees, both front-line workers and managers, should be knowledgeable and skillful operatives, competent in their job roles, and capable of deploying the interventions. It was noted that capability referred not only to the ability to understand what was required, but also to be physically and emotionally capable of performing the task. A range of individual level factors were identified that enable or hinder the successful implementation of a safety intervention. Some of these were demographic factors (e.g., education level) and others included psycho-social factors such as morale and resentment. Motivation to engage with the new intervention and how this could be engendered was also important.

Organizational size can influence the successful adoption and implementation of a trained safety intervention. Often small scale, and simpler, interventions are deployed in small-medium enterprises, whereas the complexities associated with successfully deploying any safety intervention in a multi-national company, for example, hampers the chances of successful adoption. Differences between public and private sector organizations in their processes and procedures, particularly around the procurement of interventions to support safety, influence the subsequent adoption and implementation. Furthermore, safety interventions are often developed independently from, and without reference to, existing processes. Successful adoption and implementation of these practices post-training is diminished because these additional processes increase workload and need to be adapted to fit existing practices, rather than being integrated into them.

The regulatory context of the industry and the local industry standards often determine what is required and what is acceptable. For example, one interviewee noted differences in approaches to risk assessment between the United States and the UK. The pursuit of external standards, including ISO standards, can influence the successful adoption of safety interventions. Sector differences, especially in their business models, may also influence the applicability of trained interventions. Where profit margins are minimal, as in the construction sector, resource availability for safety may be less than in other sectors. Geographic differences may also prioritize some contextual considerations over others, which may influence training. In less developed countries, considerations of nutrition and disease status of the workforce may be primary, and considerations of mental health secondary.

3.3.2. Cultural factors (Table 6)

Managers need to be committed to the training and the implementation of what is learned. In large organizations with a sizable cadre of middle managers support for a safety intervention can be easily diluted, even if the senior management team is very supportive. Managers also need to be technically competent and able to understand the issues on the shop floor. The focus of their attention, and often that of the front-line workers, is often driven by what gets measured. This can influence the likely adoption of a particular trained safety practice. The reporting lines for these metrics influence the importance attached to it, and subsequent actions.

The interviewees unanimously identified organizational culture as one important contextual factor that determines whether a trained safety intervention will be deployed. Organizational culture, particularly the importance attached to safety, will determine whether organizations will pursue minimal compliance with regulations and standards, or seek best practice. Organizational culture will also influence whether employees are encouraged to speak up concerning safety issues without fear of adverse consequence, and this affects the likely adoption of practices. An acid test of the rhetoric around positive safety culture is whether anyone has ever stopped production and been supported in doing so.

National cultures also influence beliefs about health and safety, create attitudes toward safety practices, and subsequently, affect the adoption of safety interventions. Raising safety concerns in the workplace may be inconsistent with life experience beyond the workplace. For instance, restricting the work on flatbed lorries may be inappropriate where it is acceptable to ride to work on the roof of a bus.

3.3.3. Political factors (Table 7)

The beliefs and values expressed in behaviors and attitudes of senior managers and leaders toward safety was identified as a critical factor. They are integral to supporting and driving a safety intervention throughout the organization. Without their commitment and support, any intervention is likely to fail. This extends across the organization to anyone with leadership responsibilities, including supervisors. It is important that leaders are visible and engage with the workforce, listen to their concerns, and remain open to suggestions.

The analysis indicated that relationships between different groups within an organization, particularly where they are adver-

sarial, can also influence the adoption and effectiveness of safety interventions post-training. Differences in intent or ambition are commonly seen between the headquarters of an organization and sites or subsidiaries geographically distant from the central office, leading to centrally determined activities not always being deployed as intended. Differences are also visible between groups within an organization, for example between professionals and managers. These tensions can affect adoption of a new practice. Different groups may display different cultures, with individuals working in these groups displaying different behaviors and attitudes. More generally, employee relations with management can affect adoption of new interventions or the adherence to existing practices. Better relationships are promoted by two-way, open communication that encourages the development of trust, which "*comes in on a tortoise and goes out on an antelope* (I6)." The presence or absence of a unionized workforce was also identified as a factor that influences the engagement with safety training and the likely implementation of trained safety interventions.

Several important enablers and barriers internal to the organization that affect effective safety interventions were also identified in the analysis. The availability of time and resources to support the development and deployment of interventions is a crucial factor. This is particularly important in large multi-site organizations where the cost of deploying a new intervention may be high, and where other, potentially conflicting, initiatives may also exist. The complexity of the intervention being deployed is also important because large complex interventions generally require more resources. Other immediate priorities within the business can influence the effective adoption of an intervention. Moreover, other organizational change initiatives running in parallel compete for resources, especially at the front-line, making it challenging to effectively deliver any of the initiatives. A downturn in the industry requiring a focus on performance output or the shedding of staff can distract from effectively deploying a safety initiative.

Local legal requirements can also determine what is required. Understanding these before attempting to make safety interventions will result in a more successful outcome. This can also create a moral dilemma for organizations that work internationally across different legislative regimes: Should an intervention be applied to all employees in the organization irrespective of the local legal requirements, or should the intervention only be locally compliant, thereby creating different standards across the organization? One of the interviewees illustrated this by reference to display screen equipment assessments. In some countries, like the UK, this is a requirement, and appropriate provision should be made; in others it is not.

Differences in state-level attitudes toward health and safety concerns may also influence the adoption of interventions and the way they are deployed. This was illustrated by reference to the differences between European countries in their implementation and response to drug and alcohol testing in the workplace. Some countries adopt a more punitive stance, while in others it is a supportive one. Sectors also differ in the extent to which information is shared between organizations, and lessons are learned. Aviation has a strong history of collaboration and sharing, which is not similarly present in other sectors.

4. Discussion

4.1. Factors affecting 'fit' between safety training and the workplace

Safety is an integral part of work practices and processes. An important aim of safety training is to ensure employees have the necessary knowledge and skills to carry out their required activities in a safe manner. This requires the transfer of what is learned in the classroom to the workplace, so that what is trained is adopted and assimilated into work routines. However, this often fails and creates the 'training transfer' problem. Ford et al. (2019) suggest that training transfer needs further conceptual development. A sociological orientation to this training transfer problem suggests that the concept of 'fit,' typically applied to the investigation of the successful (or otherwise) adoption of innovations in practices and procedures in new organizational settings, addresses the same phenomenon. Adopting this approach by using the framework proposed by Ansari et al. (2010), the authors have been able to address Baldwin and Ford (1988) concern by providing empirical evidence for a coherent set of factors operating at different levels in the work environment that influences safety training transfer. Moreover, by capturing this coherent set of factors in a single study, the authors address the imbalance noted in previous studies (Blume et al., 2010; Bell, Tannenbaum, Ford, Noe, & Kraiger, 2017) where several factors in the work environment have received considerable attention to the neglect of others.

In this study, experienced safety trainers reported that the influence of context is considered in both the design and delivery of training as suggested by both Casey et al. (2021) and Chen et al. (2022) in their recent reviews. Alignment of training content with workplace practices at the design stage is essential for success. Incorporating an approval process helps to ensure this. Consideration of context also occurred at the delivery stage. Some modes of delivery were more effective at incorporating contextual factors than others. Case studies and discussions lend themselves to considerations of the influence of contextual factors where standardized e-learning materials do not.

The framework of technical, cultural, and political factors that influence 'fit' operate at three different levels of analysis: individual, organizational, and supra-organizational. Investigation of factors influencing safety training transfer typically focus on individual characteristics, on support provided by others, and safety climate. Apparently, little attention has been given to the influence of factors operating beyond the organization. Casey et al. (2021) suggest that national culture differences may influence the effectiveness of safety training transfer through learner engagement, but this remains underexplored.

Individual characteristics influence the adoption of safety interventions. Although the former is recognized in several frameworks describing training transfer (Grossman & Salas, 2011; Sitzmann & Weinhardt, 2018), reports of safety training focus primarily on motivation, self-efficacy, and cognitive ability (Chen et al., 2022). A recent review of 73 empirical studies of the design and implementation of safety interventions (Karanikas et al., 2022) indicates that, while cognitive aspects, such as knowledge and skills, were frequently considered, physiological and emotional factors were astonishingly underrepresented. The interviewees drew attention to the common assumption that everyone can deploy any safety intervention if properly trained, but recognized that this is not always the case. Disabilities of different degrees may negate this presumption, as, for example, different degrees of intellectual disability affect the level of human functioning and the level and type of support required (Shogren, Luckasson, & Schalock, 2014).

At an organizational level, the interviewees indicated that 'fit' may be strongly influenced by the characteristics of the business, particularly sector and size. Adoption practices in public sector organizations, which are typically larger and more bureaucratic, will differ from private sectors organizations, many of which are small with only a few employees. Small and medium-sized enterprises (SMEs) dominate the economy of many countries, including the UK (Roland, 2020). Moreover, it is anecdotally acknowledged that SMEs are hard to reach in terms of safety training, and therefore the adoption of new practices is likely to be correspondingly low (Demirkesen & Arditi, 2015). It was also recognized by the

interviewees that the pursuit of ISO standards can drive specific behaviors to the exclusion of others, which may not be consistent with improving safety performance (De Oliveira Matias & Coelho, 2002). Safety interventions that do not align with this ambition are less likely to be supported and adopted.

Leaders and managers or supervisors have a strong influence on the adoption of safety interventions by employees (e.g., Vecchio-Sadus & Griffiths, 2004) regardless of the training provided. While senior leadership can initiate, support, and encourage the adoption of particular safety interventions, the interviewees also acknowledged their effective application at the frontline is strongly influenced by the cadre of managers and supervisors organizing work on a daily basis and demonstrating their own safety behaviors (e.g., Clarke, 2013; Lingard, Cooke, & Blismas, 2012). Sinelnikov, Bixler, and Kolosh (2020) recently reviewed the role of work-unit supervisors on organizational safety and concluded that training to improve their safety knowledge, attitudes, and behaviors had a positive effect on occupational safety.

Where training is mandated, or perceived to be irrelevant or unnecessary, support to initiate post-training changes will be low (Casey et al., 2021). Similarly, where any intervention conflicts with other dominant priorities such as production (Pagell, Klassen, Johnston, Shevchenko, & Sharma, 2015), support will also be reduced regardless of whether safety training was offered to bring changes. Processes, for which operational rules are not aligned or conflict, are likely to inhibit adoption of trained interventions, as illustrated in the operations of a factory in the Netherlands (Mascini, 2005) and confirmed by the interviewees in this study.

The interviewees indicated that different groups of employees in the same organization can also respond differently to training in new safety interventions, both positively and negatively. In some instances, this may be manifest in differences between professional staff and managers, in other cases, there could be a difference between unionized and non-unionized workforce (Gillen, Baltz, Gassel, Kirsch, & Vaccaro, 2002; Demirkesen & Arditi, 2015). A further distinction between permanent and temporary employees has been made by Luria and Yagil (2010). They suggest that temporary employees are more concerned with self-interest than permanent employees who act in the interests of the group or organization. Such differences are likely to affect the adoption of safety interventions and comprise contextual factors that influence safety training transfer.

At the supra-organizational level, external environmental conditions can also influence the success of training in, and deployment of, new safety interventions. Global differences in national cultures were acknowledged to encourage or preclude the adoption of particular safety interventions (Reader, Noort, Shorrock, & Kirwan, 2015). For example, differences between cultures in the power distance between managers and employees can discourage reporting (Starren, Hornikx, & Luijters, 2013). Arabic cultural values that privilege family connections and social harmony militate against the development of 'just' and 'reporting' cultures (Ben-Saed & Pilbeam, 2022).

Applying this framework to our empirical investigation of training transfer has helped to more fully elucidate the set of contextual factors that set the boundaries of the theory (in this case of training transfer) and delimit its range, as advocated by Whetten (1989). Furthermore, the foregoing discussion suggests that it has provided a coherent organizing framework for the findings from existing studies too.

4.2. Practical considerations

The 3x3 matrix of technical, cultural, and political factors operating at individual/intra-organizational, organizational, and supra-organizational levels provides a framework that can be used to identify factors that adversely affect training transfer and simultaneously suggest where interventions that complement and support training could be targeted. The analysis of the data using this framework draws attention to several important practical considerations. From a technical perspective, not all employees are identical, and their training needs and levels of competence may differ substantially. Current standardized safety training overlooks these increasingly important demographic considerations, and how this may impact training transfer. Moreover, current interventions to improve organizational safety that are the subject of safety training are often developed independently from existing processes. This creates potentially conflicting processes and additional work. Health and safety professionals developing new interventions should work in partnership with other functions to integrate improvements into existing processes to render deployment post-training more successful.

Organizational culture and the level of support given to safety are contextual factors that significantly influence safety training transfer. Regular audits of safety climate using existing cross-industry scales (e.g., Beus, Payne, Arthur, & Munoz, 2019) or industry-specific scales (Casey, Hu, Kanse, & Varhammar, 2022) and subsequent targeted interventions to enhance safety climate may also simultaneously encourage safety training transfer. Importantly, the framework also draws attention to the political nature of organizations. Adversarial relationships in an organization, between different groups having different agendas, have a significant impact on safety training transfer. Ultimately, they may result in divergent safety practices and safety performance across groups or units within an organization. Different perceptions and understandings of safety can also arise from differences in geographic location. Such variation makes the standardization of safety practices problematic, especially in organizations operating in multiple locations, or with a diverse workforce drawn from different cultural backgrounds.

In their review of the effectiveness of safety training interventions, Sinelnikov et al. (2020) drew attention to the lack of understanding behind the decision-making processes regarding training. This was commented upon also by interviewees in this study, who raised two important practical questions for organizations to consider. First, is the training effective? An evaluation by organizations of the effectiveness of safety training they provide in-house or outsource appears to be uncommon and may not be high. Albert and Routh (2021) note that "training interventions do not [always] yield tangible benefits and may sometimes simply reduce to wasted resources." An inquiry into the extent of the benefits achieved through training is often absent. This failure to evaluate effectiveness may conceal a significant unnecessary cost to organizations given the considerable budgets spent on training annually (Sitzmann & Weinhardt, 2018). According to an early Health and Safety Executive report (HSE, 2003), per capita expenditure on compliance with UK H&S regulations, including training, is disproportionately greater for employees in SMEs that can perhaps least afford to waste money.

Second, is training needed? Is it the most appropriate safety intervention for the particular situation? Interviewees in this study identified a variety of different motivations for training driven either by requirements of external stakeholders, or by a perception of need from within the organization. While providing safety training is a relatively easy and simple response to a safety issue, and one that can be adopted quickly and demonstrably, not all safety issues can be resolved through training. Some safety challenges may not be competence related, but rather issues of design to be better tackled by actions at different levels of the hierarchy of controls. Training is an example of administrative controls, at the lower end of this hierarchy. Changes in design, occurring further

up the hierarchy of controls, can isolate people from hazards (engineering controls), replace hazardous components or elements (substitution), or remove the risk (elimination), but require thorough and careful planning before implementation. This is likely to be complicated and take time and effort and necessitate organizational change, and, consequently, may be unpopular. Evaluating the choice of intervention implemented appears to be a vital requirement (Sinelnikov et al., 2020) if improvements in organizational safety are to be made.

4.3. Study limitations and future work

This study has several limitations. The data were collected from a limited number of respondents, albeit knowledgeable and very experienced trainers. Other trainers with different demographic characteristics and different levels of experience may identify different or additional factors that influence the training transfer process. Furthermore, the data presented come from the aggregation of factors identified from the interviews, during which each trainer considered different training interventions and their application to different contexts. This provides a generalized set of data, but provides no indication of the causality between the particular factors and the (un)successful transfer and subsequent adoption of a specific intervention. Finally, the focus of the interviews was on training interventions taught in classroom settings, meaning the transfer from classrooms to workplaces. Thus, this study did not account for factors that influence the transfer of online learning to the workplace, or 'workplace' learning or 'on-the-job' training (Cheng & Hampson, 2008), although the authors expect that many of the same factors influence transfer in these settings too.

Four avenues for further research present themselves from this study. First, and following the earlier noted limitation, the factors that influence the effectiveness of workplace learning to improve safety merit thorough investigation. A recent study showed that workplace learning can unwittingly promote unsafe work practices preventing necessary safety improvements (Grytnes, Nielsen, Jørgensen, & Dyreborg, 2021). The contextual factors that influence the effectiveness of this learning process may differ from those that affect the adoption of classroom-based training. Second, online training is relatively more standardized than classroom-based training. This may make the transfer of what is trained more vulnerable to a wider range of contextual factors. With the growth in this mode of delivery of safety training, further investigation of enabling and limiting factors for transfer of online training is warranted. Third, this study identified a small number of characteristics of successful trainers. These included experience of the industry and similar demographic characteristics to the participants, as well as training experience. Building on the work of Freitas and Silva (2017), the contribution trainers make to effective and successful training requires more extensive investigation to generate a more comprehensive set of essential characteristics or core competencies. Their role in the contextualization processes should also be investigated further. Finally, transfer is a dynamic process that unfolds over time (Blume et al., 2019) and warrants a systematic investigation of the evolution of 'fit' through the design, delivery, and on-going implementation of safety training interventions. This may contribute to a deeper understanding of 'far transfer' (Barnett & Ceci, 2002).

5. Conclusion

Training is a commonly deployed safety intervention. However, its purpose is often ambiguous, designed to satisfy external stakeholders or to meet internal needs, and surprisingly its effects are not commonly evaluated. Effective training depends on the successful transfer of what is learned in the classroom to the workplace. A process that is influenced by a variety of contextual factors. This study re-conceptualize training transfer using the notion of 'fit' from innovation adoption studies, allowing the authors to categorize influential contextual factors into technical, cultural, and political categories and to discriminate them according to their level of influence: individual/intra-organizational, organizational, and supra-organizational.

The substantial, if not fully comprehensive, set of contextual factors identified by 12 experienced safety trainers highlights, for the first time, the importance of supra-organizational factors on training transfer. The categorization also draws attention directly to the political nature of organizations and how this shapes what is and is not acceptable to different groups, and so whether adoption of trained practices in the workplace is likely. Greater awareness of these factors and their relationships to the design and delivery of safety training may improve the subsequent adoption of the taught practice or intervention, minimizing the training transfer problem, and more importantly, improving safety outcomes in the workplace.

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Appendix A. . Interview questions.

1. Please could you briefly describe your experience of delivering training in Occupational Safety and Health.
   - What topics do you mainly focus on?
   - What sectors / industries?
   - What level do you train?
   - Are there particular interventions / practices / methods you train?
2. In your training
   - Do you consider how context might influence the performance of these interventions?
   - Do you consider whether the interventions might need to be changed in some way to be effective?
3. ***IF YES (to Q2)***: Where it is considered, why does this occur?

- Is this consideration of 'contextualisation' included in the formal design (curriculum) of the training courses you offer? OR does it 'happen' (through discussion/conversation) informally during the training event?
- What contextual factors do you consider in the design of the training course? Or during the training event? Why these in particular?

4. ***IF NO (to Q2)***: Where it is not considered, please explain why you think this is the case?
   - Would it make a difference to the people you train if it were considered? Why?
5. As far as you are aware, to what extent does H&S training take account of contextual influences?
   - Why do you think this is the case?
   - Can you provide some examples of where it does and where it does not?
6. Based on your experience, do you think it would make a difference to organizational safety outcomes (such as OSH performance, safety behaviours) if contextualisation was considered in training on particular safety interventions? Why?
7. Based on your experience, what are the contextual factors someone should consider when designing and implementing a safety intervention? Why these?

8. Based on your experience, what are the most important aspects of organizational context that influence the effectiveness of safety interventions? Why? How?

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