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# **LEARNING THAT CAN SAVE LIVES**

Psychological Perspectives on the Process of Learning Lessons from Major Incidents and Disasters

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## **PREFACE**

History demonstrates that the failure to learn and act upon lessons from major incidents and crisis exercises will undermine preparedness, leaving individuals, organisations, and institutions vulnerable to repeating past mistakes when the next disaster strikes. What lies at the heart of these failures? This paper explores that question from a psychological perspective, examining some of the challenges associated with the 'lessons learned' process and offering helpful insights that can be practically applied to improve preparedness.

## FOREWORD

In March 2021 the UK Government published a paper entitled 'Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy' in which it outlined a vision for the UK's role in the world over the next decade.<sup>32</sup> In the opening pages of the publication, the Prime Minister articulated a resolve to 'build back better' from the Coronavirus pandemic and ensure that the UK emerges '*stronger, safer and more prosperous than before*'. To achieve this, the Review sets out four key objectives in the context of a Strategic Framework to guide the government agenda between now and 2025. Amongst the objectives is an explicit commitment to 'build the UK's national resilience'.<sup>33</sup> Under this heading, the authors clearly indicate that the process of 'Learning the lessons of COVID-19' will inform the government's resilience-building strategy and support the development of improved national preparedness. In fact, the importance of learning lessons from the current crisis is made ten times within the document, arguably becoming a crucial theme that spans review sections and the overarching strategic objectives. Consequently, it can be said that the integrity of the foundations on which the UK intends to build strengthened national resilience in the post-pandemic era now depends, at least in part, on the effectiveness and application of that learning process.

Given that the process of learning and acting upon lessons from major incidents and disasters has proved to be a notable and persistent national challenge in a range of contexts, it is timely to consider how new learning perspectives can be practically applied to overcome key points of failure. In doing so, a range of stakeholders can build increasingly robust and resilient learning cultures that reduce future losses by preventing post-disaster lessons and reflections from falling by the wayside and embedding change to improve preparedness for future adversity. After all, '*there is little point in knowing how to prevent a disaster if no active steps are taken to prevent it.*'<sup>34</sup>

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## INTRODUCTION

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The adoption and application of a process for identifying and acting on 'lessons learned' from adverse events to inform future planning is a key characteristic of any preparedness system<sup>35</sup> It is also considered best practice in risk management, civil contingencies planning and international Disaster Risk Reduction (DRR).<sup>36</sup> The purpose of a lessons learned process is to identify new knowledge that has arisen from the experience of a crisis exercise or disaster event, and transform that knowledge into practical actions that reduce the risk of loss to lives, livelihoods and the environment in subsequent emergencies. In theory, this process results in practical, positive hazard adaptations, such as changes to policy, procedures or behaviours, that improve strategic, operational and tactical crisis preparedness and response when required.<sup>37</sup> When well designed, embedded and practically implemented, the preventative measures that result not only have the power to decrease the disruption associated with adverse events but also have the potential to reduce disaster mortality rates<sup>38</sup>, enabling the state to achieve its primary objective of protecting the welfare and wellbeing of its peoples.

The process of learning from adversity to inform plans and actions that improve future outcomes is nothing new. In fact, it could be argued that humans have been innately instituting informal, personalised lessons learned programmes for centuries, assessing threats and acquiring knowledge from the environment to inform adaptive, self-preserving behaviours that promote survival. As such, the propensity to leverage learning from adversity is quintessentially human, and the act of scaling it up in modern social contexts is a simple, common-sense solution to achieving improved preparedness. Paradoxically, however, it has become apparent in recent decades that the process of learning lessons from major incidents, crises and disasters does not come as naturally as one might hope, and often fails to be as straight forward as many would expect.

The challenge of transforming knowledge acquired in adversity into practical actions that strengthen future preparedness is so pervasive and persistent that it is acknowledged at a global level.<sup>39</sup> In the worst-case scenario this means that vital learning falls by the wayside, leaving plenty of scope for mistakes of the past to be repeated<sup>40</sup>. The extent of this problem has led some commentators to argue that 'we don't learn' the lessons from major incidents and crisis exercises which in an increasingly interconnected world with rising disaster prevalence gives cause for great concern.<sup>41</sup> However, as Le Coze rightly points out in the paper entitled 'What have we learnt about learning from accidents?', *'the claim that "we don't learn" is not based on in-depth empirical studies'*.<sup>42</sup> Instead, it represents a sweeping statement that condemns the process without investigating and addressing the real issues, limits and constraints in individual and organisational learning.<sup>43</sup> With the call to 'learn the

lessons of Covid-19' already ringing clear across contexts, countries, and continents, the need to identify, understand and address these limits and constraints has arguably never been so vital. As the United Nations Educational, Scientific and Cultural Organization on Human Futures in Learning recently put it: '*In a world defined by increasing complexity, uncertainty and precarity, we must urgently re-examine and reimagine how knowledge and learning can best contribute to the global common good.*'<sup>44</sup>

In the recent paper 'Building Better Resilience', the National Preparedness Commission highlighted three areas that are considered crucial in understanding how we can achieve better preparedness going forwards. These include: Active Resilience; Human Psychology and Complex Systems.<sup>45</sup> As learning is an inherently psychological process, this paper grounds the exploration and examination of issues associated with the lessons learned process in the common human psychology of people involved in that learning. As the scientific study of mind and behaviour, the psychological disciplines are well positioned to support an understanding of how people tick, and how this understanding can be applied to help address a range of issues in modern society.<sup>46</sup> With a rich legacy of research on the topic of learning and areas such as individual differences, motivation, persuasion, attitudes, values, brain function and behaviour change,<sup>47</sup> psychology can offer indispensable insights into theory and practice associated with human aspects of the lessons learned process.<sup>48</sup> In addition, psychology can also offer perspectives on the nature of groups, organisations, communities, and societal institutions in which the process is outworked.

Given that the literature and expertise on the topic of learning is vast, the content that follows does not aim to condense it into an ill-fitting space. Instead, the aim of the paper is to demonstrate that psychological perspectives can play a vital role in helping to unpick the challenge of learning from major incidents and disasters, providing important insights into aspects of mind and behaviour that can influence the learning process and impact preparedness outcomes. To achieve this goal the paper takes the idea of a lessons learned process back to its bare bones, acknowledging that learning must in fact first be realised in the brains of individuals long before it manifests *en masse* at the organisational or institutional level. In doing so the intention is not to reduce an acknowledged international learning challenge to a function of human biology but, on the contrary, to demonstrate that perhaps a re-examination of the issues and constraints associated with individual, and indeed group level learning in the disaster management context, might provide a missing piece in the much larger lessons learned puzzle that organisations and institutions have been trying to solve for far too long. Given that improvements in post-pandemic resilience now rely in part on a national

learning endeavour, getting the all the pieces of the puzzle in the right place has arguably never been so vital.

The paper goes on to conclude with a call to leverage the ever-expanding wealth of knowledge on aspects of individual and group learning to re-imagine and reinvigorate the lessons learned process. In doing so, there is significant potential not only to reduce the risk of past mistakes being repeated but also to improve performance and increase future preparedness, as we build towards an increasingly safe, secure and resilient society.<sup>49</sup>



The sweeping assumption that ‘we don’t learn’ from major incidents and disasters may not be entirely accurate but phrases such as these do not gain significant sustained traction in global disaster dialogues without good reason. In truth, the challenge of transforming lessons into practical learning that improves preparedness is prominent, persistent and pervasive. Therefore, it is essential to begin by extending sufficient space to review the nature of the problem before psychological perspectives are applied.

### 1.1 A LEGISLATIVE LEARNING CHALLENGE

The UK demonstrates an established institutional precedent for investigation into a range of disasters, accidents and emergencies to determine causes, identify lessons and make recommendations for improved preparedness. The importance and responsibility associated with this process is reflected in significant pieces of legislation, including the Health and Safety at Work Act 1974, and Management of Health, Safety Regulations 1999 and Inquiries Act 2005.<sup>50</sup> The Civil Contingencies Act 2004 adds further legislative weight to this responsibility in the emergency management context. As the single framework for civil protection in the UK, the CCA requires a range of responders (including the emergency services, local authorities, responding health bodies, government agencies, and critical infrastructures) to plan and prepare for emergencies. It also requires responders to regularly exercise those plans in collaboration with other agencies, putting procedures in place to record and capture lessons emerging.<sup>51</sup> This demonstrates that the process of identifying and acting upon lessons from major incidents and crisis exercises goes to the heart of UK governance. It also underscores the inherent connection between lessons learned processes and the fundamental protection of both people and place in the UK.

Although legislation promotes learning, it plays a limited role in the assessment of whether learning from major incidents and crisis exercises is practicably achieved. For example, the CCA (2004) does not: prescribe and/or institute a universal framework that the implied learning process to follow; make provision for quality control of learning processes across regions and localities; provide an auditing function to track the practical application of lessons that could save lives; or, unambiguously, allocate responsibility and accountability for the achievement of learning outcomes in context.

The CCA is, therefore, not a means for assessing or drawing conclusions about whether identified responders learn lessons effectively. It also allows for design and efficacy of learning programmes and processes to vary significantly across organisations, sectors and localities. This is not to say that relevant standards, best practice and examples of excellence in learning from adverse events are absent. It simply illustrates that the current learning landscape does not lend easily to an integrated analysis of progress and there is no singular piece of cross-sector research to support a generalised ‘failure’ to learn from disasters nationwide. Therefore, it is right to preface the problem by acknowledging that exceptional efforts in this area undoubtedly exist (but likely go underreported and uncelebrated) and that the intent in exploring the issue is not to undermine and demotivate the commitments of those working hard to address it.

## **1.2 A PERSISTENT LEARNING CHALLENGE**

In the absence of other means for comparative assessment, decades of post-event reports and investigations into high-profile disastrous incidents have been used to evidence the existence a persistent problem with learning lessons in the UK. These documents include a range of public inquiries and major incident reports which are purposed to establish causes of a disaster and recommend preventative measures for the future.<sup>52</sup> As these reports identify a range of lessons to be addressed by key responders and wider stakeholders, they can be viewed as *‘the most valuable source of information to help prevent recurrence of disasters.’*<sup>53</sup> From this perspective, they offer two things that the CCA and associated best practice guidance cannot: (i) a means for reviewing ‘evidence’ of contextualised learning based on whether key lessons identified seemingly resolve or recur in subsequent reports, and (ii) a means of comparing the recurrent nature of recommendations within and between specific categories of responders.

As Category One responders with key responsibilities for the provision of an emergency response, it is common for lessons identified to focus on the decisions and actions taken by the fire, ambulance and police services following a major incident. This has especially been the case following the introduction of relevant non-statutory guidance under the Joint Emergency Services Inter-Operability Principles (JESIP) which guide collaborative, coherent working between blue light services as a matter of course. With inquiry documents in the public domain and the specific remit around interoperability in place, comparative reviews of recommendations across reports have been undertaken to determine whether lessons identified have subsequently become lessons learnt.

One review carried out in 2013 on behalf of JESIP and the Cabinet Office examined 32 reports, (including public inquiries) pertaining to the ability of the emergency services to apply JESIP principles during major incidents.<sup>54</sup> The Pollock Review, tellingly entitled 'Persistent Lessons Identified Relating to Interoperability in Emergencies and Major Incidents since 1985' cited '*...numerous examples of inquiry reports identifying previous incidents where lessons were identified and recommendations made but not acted upon.*'<sup>55</sup> Examples included the failure to learn from no less than eight prior reports on crowd safety and crowd control spanning a 60-year period ahead of the fatal Hillsborough Stadium crush in 1989, and a failure to learn from the communication challenges between over and underground responders during the 1987 Kings Cross Fire in London, which meant the same problem was re-encountered 17 years later during the London 7/7 terrorist bombings response in 2005. This led Pollock to assert that: '*The consistency with which the same or similar issues have been raised by each of the inquiries is a cause for concern. It suggests that lessons identified from the events are not being learned to the extent that there is sufficient change in both policy and practice to prevent their repetition.*'<sup>56</sup> Seemingly, then, it is not simply the presence or absence of learning that determines whether a lesson is suitably learnt but perhaps that the extent of that learning must reach a critical tipping point to effect change.

### **1.3 A 'SUFFICIENT' LEARNING CHALLENGE**

Across the reviewed reports multiple factors appeared to limit the achievement of 'sufficient' learning from lessons identified. These included organisational failures, leadership inadequacies, poor working practices, the presence of bias and blame culture, insufficient resources and the absence of a framework for monitoring the active implementation of lessons.

Despite the presence of these limiting factors, a simple visual inspection of the language used to describe the persistent lessons identified in the Pollock Report supports the premise that learning is a root issue rather than a proxy for action or other process aspects. This can be illustrated by cross-referencing the persistent lessons with five indicators known to play significant roles in reduction of repeated mistakes and development of a robust safety culture and in organisations that continually mitigate major accident hazards.<sup>57</sup> (Figure 1) Across these indicators (including Leadership; Two-way communication; Employee involvement; Learning culture and Attitude towards blame), it is clear to see that most lessons cluster around the 'learning culture' indicator.<sup>58</sup>

Learning culture refers to the individual and organisational ‘*values, attitudes, perceptions, competencies, and patterns of behaviour...*’ associated with learning in any given organisation or context. Therefore, shortcomings related to teaching, training, monitoring, auditing and achieving ‘sufficient’ learning to effect change do all point towards a fundamental challenge with learning from major incidents and disasters.<sup>59</sup>

Figure 1: A comparison of persistent lessons identified in the Pollock Review with indicators influencing the development of wider safety culture in organisations.

| Indicators that Influence the Development of Safety Culture<br>(Gadd, 2005) | Persistent Lessons Identified<br>(Pollock, 2013)                                 |
|---|--|
| LEADERSHIP  | Lack of leadership   |
|   | Poor organisational planning   |
| COMMUNICATION   | Ineffective communication  |
| EMPLOYEE INVOLVEMENT  | Poor working practices   |
| LEARNING CULTURE  | No system to ensure <b><u>lessons learned</u></b> and staff <b><u>taught</u></b> |
|   | Failure to <b><u>learn</u></b> lessons   |
|   | Previous <b><u>lessons</u></b> /reports not acted upon                           |
|   | Inadequate <b><u>training</u></b>  |
|   | No <b><u>monitoring/audit</u></b> mechanism                                      |
| ATTITUDE TOWARDS BLAME  | Absence of no blame culture  |

#### 1.4 A 'WICKED' LEARNING CHALLENGE

Seven years after the Pollock Report, the learning challenge apparently shows little sign of abating.<sup>60</sup> Consequently, it may be time to conceive the broad generic challenge associated with lessons learned programmes as a 'wicked' problem.<sup>61</sup> By definition, wicked problems pose a significant societal challenge; are marked by 'complexity, uncertainty, and ambiguity'; lack a clear, singular cause; and often involve multiple stakeholders. These elements can be easily seen in the interoperability example which demonstrates the societal importance of an effective, integrated emergency response but perhaps leaves other complexities unacknowledged and under-explored; for example, whether recommendations are viable in real world settings and wider systems, or whether there is sufficient capacity and resource across multiple stakeholders to address large volumes of recommendations (which can run into the hundreds) and effect the required change in limited time frames.

The downside of conceptualising the lessons learned challenge as a wicked problem is that it would then join a range of other wicked problems such as poverty, obesity, energy security and global warming which can be as complex to understand as they are to solve.<sup>62</sup> Whilst the thought of adding another complex societal challenge to this list is unappealing, accepting an unattractive reality is often the first step on the path to progress. Accordingly, it may be high time to acknowledge: that progress in learning from disasters is urgently required to move forwards; that the phrase 'we don't learn' should perhaps be left in the past; and that the multi-faceted, non-linear and incremental nature of learning in the UK preparedness context deserves deeper research than it has been afforded. In doing so, key stakeholders may be better placed to consider learning limitations in context and begin incubating one of the vital ingredients required to address any wicked problem: *innovation*.<sup>63</sup>

## 2 CASE STUDY: INCREMENTAL LEARNING FOR IMPROVED PREPAREDNESS – COVID-19 IN TAIWAN

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In 2019 the Global Health Security (GHS) Index published a comprehensive benchmarking of levels of health security across the 195 World Health Organisation (WHO) member states.<sup>64</sup> Their findings stated that '*national health security was fundamentally weak around the world*'. With an average health security score across states of just 40.2 out of a possible 100, no single country was seen to be fully prepared for pandemics', although the UK was ranked in a seemingly comfortable 2<sup>nd</sup> place. What the world had not yet realised, however, was that the time to prepare for the next pandemic was up.



In some areas the threat of experiencing a catastrophic biological event had been steadily increasing for some time but the risk was felt particularly acutely in the province of Taiwan. Having suffered the SARS epidemic in 2003 and then the H1N1 influenza outbreak in 2009, the region had developed an in-depth understanding of the risks associated with infectious diseases. This meant that despite being ranked 30<sup>th</sup> in the GHS Index, Taiwan became '*a rare positive example of how governments can contain the spread of the new coronavirus disease*'.<sup>65</sup>

The strength and speed of the Covid-19 response was attributed to lessons learnt and acted on following the earlier health emergencies in the late 1990s and 2000s which had fostered a powerful combination of '*early preparedness, health expertise, government competence, and popular alertness*'.<sup>66</sup> A primary example of this can be seen in the establishment of the Taiwan Centre for Disease Control (TCDC) which was set up in 1997 following the H5N1 outbreak to address the identified need for advanced surveillance of new and emerging infectious diseases. Whilst this would seem to indicate a lesson learnt, continued commitment to incremental improvements in learning was required after enhanced surveillance at the TCDC seemingly failed to identify SARS before it arrived 'unexpectedly' in 2003, leading to 346 cases and 37 deaths.<sup>67</sup> By investigating the problem, it was found that front-line doctors struggled to achieve the hospital surveillance protocols in real-time practice. Consequently, a new 'automatic syndromic surveillance

protocol' was already in place in Taiwanese emergency hospital departments to monitor new suspected cases before the first indicators of an unidentified viral pneumonia outbreak in Wuhan were reported to the WHO at the end of 2019. This helped to identify, isolate and report back arriving Covid-19 cases to the TCDC. When used in tandem with a casualty 'Traffic Control Bundling' system that triaged patients before entering the hospital, it proved very effective in reducing transmission rates amongst health care workers compared with the SARS outbreak in 2003.<sup>68</sup> It was also credited for helping to protect the wider healthcare system, leading to the conclusion that: '*An integrated approach that incorporates public health, human services and healthcare systems can increase resilience and better prepare nations for future events.*'<sup>69</sup>

This case study demonstrates that although lessons can be identified and acted on in a linear fashion in theory, learning is often cyclical, incremental and more inter-connected in real-world practice. Solutions may also be subject to significant iterative improvements as learning is updated following subsequent experiences of adversity.

### **3 THE IMPORTANCE OF HUMAN PSYCHOLOGY IN LEARNING FROM MAJOR INCIDENTS AND DISASTERS**

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Lifelong learning has been described as a key to unlocking progress in the 21<sup>st</sup> Century. This is because it is one of the few means by which the '*challenges posed by a rapidly changing world can be met*'.<sup>70</sup> The reason that the psychological processes involved in learning can meet these challenges is found in the brain's incredible ability to acquire, accommodate and adapt to new information and learning throughout the lifespan. In fact, the ability of humans to outperform all other organisms when it comes to learning sets people apart and has led experts in educational neuroscience to conclude that our brains are optimised specifically for it.<sup>71</sup> Consequently, it has been said that to '*understand learning is to understand the brain*'.<sup>72</sup> This means that to make the case for the inclusion of psychological perspectives on learning from major incidents and disasters, a brief introduction to the brain as our learning apparatus is both necessary and helpful.

#### **3.1 FROM THE NEURON TO THE NATION: THE BRAIN AS CRITICAL INFRASTRUCTURE**

In an ever-changing threat landscape, the human brain can be conceived as an individual's 'critical infrastructure'. It may weigh just 2% of our body weight but every day the brain consumes approximately 20% of our energy, firing electrical impulses across billions of brain cells (known as neurons) at about 268 mph to inform everyday thinking and behaviours.<sup>73</sup> In doing so, it maintains the body's critical lifelines, navigates threats and opportunities, attends to salient information, and drives adaptations to support survival.

Extending the analogy a little further, when teams and organisations gather to deliver an emergency response or achieve preparedness goals, these individual units of critical infrastructure can be seen to connect, creating complex, interpersonal power networks that provide essential services to affected or at risk populations. When viewed from this perspective, the relevance of the micro in the macro begins to emerge. All parties, whether leaders, legislators or first responders, rely on these critical infrastructures – on people – to work efficiently, effectively and collectively to achieve key mission objectives. The process of learning lessons from crisis events and exercises to build better resilience is, therefore, one that connects the humble neuron to the welfare of a nation. But despite the critical role that human brains play both individually and collectively when it comes to unpicking the problems associated with learning from major incidents and disasters, they perhaps do not always attract the consideration they deserve. Consequently, a case for the increased inclusion of



psychological expertise and perspectives on learning in the civil contingencies' context can be made.

### 3.2 LEARNING ABOUT LEARNING

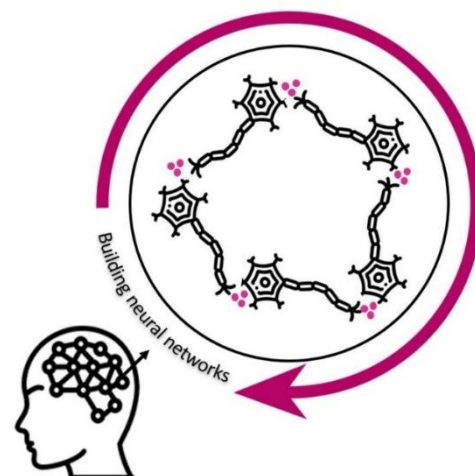
Thanks to a large and ever-increasing body of psychological literature, spanning developmental, social, cognitive, behavioural and neuroscientific domains, we have accumulated a wealth of information about how people learn, and even how one might learn to learn better. As such, it could be suggested that both the 'problem' of learning from major incidents and disasters and at least one part of the solution, are within our hands waiting to be connected. Put another way: *'If lifelong learning is absolutely essential and learning how to learn is feasible, then learning about learning takes on real importance.'*<sup>74</sup>

### 3.3 THE PSYCHOLOGY OF LEARNING

Behind the general conception of learning as a process in which knowledge is created and transformed into goal-directed behaviours<sup>75</sup> is the neurophysiological reality that learning involves a restructuring of circuits in the brain. The process of learning fundamentally initiates, strengthens and re-wires a person's neural networks in response to new or updated information, to *'inform and change the way we perceive, perform, think and plan.'*<sup>76</sup>

During learning these changes span multiple brain areas, including those involved in cognition, memory, emotion, motivation and movement. Together they form rich neural networks that work to encode, store, rehearse, retrieve and recall learning as required. The more that specific neural connections and networks associated with acquired learning are activated, the stronger and more efficient they can become. This process supports a range of learning outcomes, including the mastery of physical skills, the acquisition of knowledge in the workplace and the development of psychological 'scaffolds' (or cognitive schema), which help to organise thoughts and behaviours in particular situations or settings, such as the delivery of an emergency response.<sup>77</sup>

Figure 2: The learning process involves the development and restructuring of neural circuits in the brain.



The same process also supports the development of personal values, attitudes and beliefs, which are known to influence a range of key factors in the crisis management context such as perceptions of risk and decision making. This means that internal, individual learning processes are inextricably linked to collective preparedness activity and the achievement of learning goals within the lessons learned process.

### **3.4 LEARNING ABOUT THE LEARNERS**

The importance of human psychology becomes especially salient when we consider that no lessons will be learnt without *people*, remember that statistical projections of disaster mortality risk represent *people*, and that the ability to build better resilience relies on *people*. Of course, we do need additional measures to support and achieve safety and security in the modern world such as excellent emergency plans and sufficient technology or physical resource to deliver them – but no emergency plan or act of preparedness has a single ounce of agency until it connects with a person. Therefore, the idea that emergency exercises test ‘plans not people’, or that the lessons safely stored online in the cloud are learnt, are complete misnomers. It is impossible to learn and retain a lesson, test a plan, or even set up the technology to support it, without the inclusion of people.

Considering the ‘learners’ in any learning context is vital. People may be learners by nature, but they are also complex beings (Wopereis, 2020. Cited in Neelan and Kirschner, 2020). Consequently, part of the challenge associated with learning from major incidents and disasters is that complex beings now sit at the heart of many other complex systems which complicates things. Put differently, the ‘learners’ live in complex times, with competing priorities and ‘*an unsustainably high level of extreme risk*’ (Ord, Mercer and Dannreuther, 2021). This creates a range of environmental and performance influencing factors that can affect organisational attempts to ‘scale-up’ the process of learning from crisis events and exercises to meet present and future preparedness requirements.

### **3.5 THE PSYCHOLOGY OF LEARNERS**

The human brain has not been subject to the same kind of advances and progress that other complex, technological systems have made in recent years. It still has, and has always had, limited cognitive capacity. This means that the brain is always looking for short-cuts to conserve energy. It is also sensitive to real or perceived threats, driven by rewards and subject a range of stressors, from daily hassles to major life events. Consequently, people can: be disincentivised to learn (because it requires ‘effort’ or a reallocation of attention and cognitive

capacity); distracted by the need to achieve pressing tasks (which may be associated with punishments or rewards based on task outcomes); reluctant to relive experiences of past 'failings' (that may evoke negative feelings or even traumatic memories); prefer to prepare for 'the last war' (because the brain demonstrates increased sensitivity to past loss compared with future gains) and be uncomfortable considering future threats, whether realised or as yet unimagined, because it fosters unfavourable feelings of ambiguity and uncertainty. In combination, this means that some of the complexities associated with the act of transforming lessons identified into lessons learnt arise from inherently human factors, according to the nature of the learners themselves. Left unconsidered and/or unaddressed this can lead to negative attitudes towards work-place learning and poor engagement with (and tolerance of) intra-organisational training programmes which may then become even more problematic in inter-agency settings involving multiple stakeholders.<sup>78</sup> In some cases, it leaves those in leadership and management roles with the significant task of re-imagining, re-invigorating and re-incentivising engagement with the lessons learned process.

To support this task, the following section presents and visualises the lessons learned process as a continuous cycle. Common points of process failure and some of the known limitations and constraints associated with both learning and the learners are outlined. It is proposed that the consideration and inclusion of psychological perspectives in the process can help those involved to achieve improved outcomes by designing with people (and the brain) in mind. Practical tips to support associated progress in policy, pedagogy and practice are then presented in Section 4, with the goal of helping to mitigate risks associated with common process failures and support organisations in maximising the achievement of key learning outcomes.

## 4 THE 'LESSONS LEARNED' PROCESS

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*'The illiterate of the 21st Century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn'. Alvin Toffler, Future Shock (1970)*

In 2006 a paper exploring the challenge of learning from major incidents and disasters in the US, it was stated that addressing the *'lack of a formal, rigorous and systematic methodology for learning and understanding how people learn and retain information'* would be of *'major importance'* to achieve progress in this area.<sup>79</sup> Similar sentiments were made in a short review of existing literature on the learning of lessons from major incidents in the UK, suggesting that an inability to understand *'the whole by breaking down/considering the component parts'* was likely to be contributing to a continued national learning problem.<sup>80</sup> In response, this section aims to do four things:

1. Provide a fresh **definition** of the lessons learned process that speaks to the psychological aspects involved.
2. Break down the lessons learned cycle in to **11 active processes**.
3. Propose a theory of **four process failures** that can contribute in isolation or combination to the notable challenge of transforming lessons identified into lessons learnt.
4. Present a new visual representation of the lessons learned cycle, with active process stages, common process failures and **six central psychological components** that can influence progress towards the achievement of learning goals.

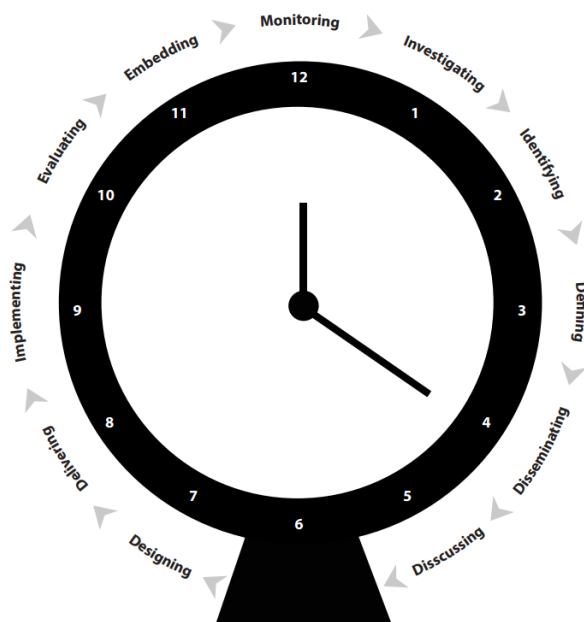
The aim in doing so is not to prescribe a one-size fits all model. On the contrary, it is recognised that unlike the 'all-hazards' approach used in risk planning, an 'all lessons' solution is unlikely due to the contextual nature of learning. Instead, the following content provides an attempt to connect the dots across academic disciplines and domains to: (i) bring fresh insight and renewed attention to a complex problem, and (ii) begin to provide a methodical approach that could be applied to address key points of failure in varied learning contexts.

#### 4.1 DEFINING AND VISUALISING THE LESSONS LEARNED PROCESS

Formal definitions of the lessons learned process and the steps or stages thought to be involved in it have been investigated, described and articulated by a number of academic authors, organisations and institutions.<sup>81</sup> Some are context specific and others more generalised. Whilst steps or stages vary, there is consensus that the ultimate purpose of any lessons learned processes is to effect and achieve individual and organisational change in response to new and updated information from real or rehearsed crisis events. This means that learning lessons from major incidents and disasters is not a single, linear event but a continuous cycle which, from the psychological perspective, can be defined as:

***The process of identifying, transforming, and implementing learning from experience to change the way individuals and organisations perceive, think, plan and perform, for the purpose of achieving persistent, measurable improvements in knowledge, competence and collective preparedness.***

This definition helps to ground the process in a psychological understanding of learning. It also details the types of change it aims to achieve, sets expectations for measurable outcomes, and provides a superordinate, overarching goal of improving collective preparedness. This speaks to the fact that intra-organisational learning should not be isolated or siloed but connected and contributing to wider resilience goals for the common good.



**Figure 3:** Eleven active parts of the lessons learned cycle.

#### 4.2 ACTIVE COMPONENTS OF THE LESSONS LEARNED PROCESS

In terms of the defined activities involved in the process, this paper reaches across contextualised models to suggest 11 specific stages of the learning cycle. These have been visualised using a clock face. This is to recognise that unlike other change programmes which

aim to achieve transformation over a suitably defined timescale, the lessons learned process is always under pressure, working against the clock as time ticks down to the next emergency event. This impresses the importance of keeping the learning process moving and can be used to help identify – for reasons to be explored in due course – when the hands on the lessons learned ‘clock’ have become stuck, or stopped moving altogether.

The active processes articulated in this model include:

- **Monitoring** – on the basis that organisations who are committed to learning are always looking at how existing risks, mistakes, errors and near-misses can be used to improve preparedness rather than waiting for a major incident to trigger learning.
- **Investigating** – to understand the what and why of challenges arising from major incidents and crisis exercises.
- **Defining** – to ensure the right lessons have been identified and are well understood.
- **Disseminating** – to share new learning identified with relevant stakeholders and support wider opportunities to address associated challenges.
- **Discussing** – to consider how the lesson identified impacts the organisation(s), agree the changes or outcomes that are desired as a result, and consider how they can best be addressed to effect change.
- **Designing** – to support the informed development of specific learning interventions, methods or practical changes that will achieve the desired change.
- **Delivering** – presenting and communicating the deliberately designed learning or change programme to relevant groups.
- **Implementing** – putting new policies, plans, knowledge and competencies to work.
- **Evaluating** – to measure whether the changes have been, or are being, achieved, in line with learning outcomes.
- **Embedding** – diffusing learning methods and/or interventions that demonstrate efficacy in achieving measurable improvements in preparedness across the organisation and ensuring that learning is sustained.

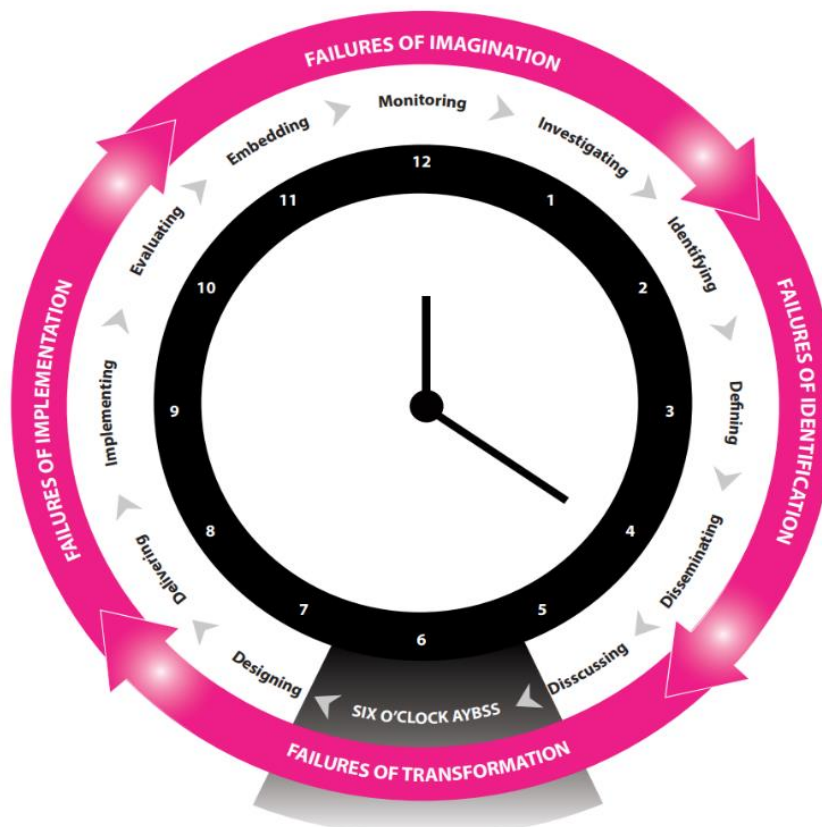
#### **4.3 A THEORY OF FOUR PROCESS FAILURES IN THE LESSONS LEARNED CYCLE**

In a recent white paper on ‘Learning from Adverse Events’, the Chartered Institute of Ergonomics and Human Factors (CIEHF) demonstrates that learning process requires an organisation to do two things: *(i) To identify and extract the right learning from the adverse events it experiences, and (ii) to use that learning to make changes to the way it organises*

and controls its activities that are effective in reducing or preventing the recurrence of similar events.’<sup>82</sup>

Considering these two key elements in relation to the process actions on the Figure 2 clockface, it could be suggested that the former relates to the first half of the cycle (12 to 6 o'clock) which could be grouped broadly as 'Identification' activities and the latter to the second (6 to 12 o'clock) that refer more readily to activities of 'Implementation'.

By conceptualising the process in this way, it is possible to begin considering common areas where the process could conceivably breakdown or fail. By leaning into noted failures in the Pollock Review and wider lessons learned reports, four common types of failure can be proposed. These include: Failures of Imagination; Failures of Identification; Failures of Transformation and Failures of Implementation. These failure types can be visualised by adding an outer layer to the process diagram which aligns each with stages at which the risk for each failure maybe most significant.



**Figure 4:** Four common process failures in the lessons learned cycle

#### 4.3.1 Failures of Imagination

The impact of failures to imagine potential threats and security scenarios, for example the use of planes as weapons, was raised in the 9/11 Commission Report in to the 2001 attack on The World Trade Centers.<sup>83</sup> Similar short-comings could be said to have occurred in significant efforts to plan extensively for pandemic flu, but not the emergence of novel coronaviruses, and perhaps be evidenced in the UK's development of the 2011 Pandemic Flu Response Plan, which assumed a worst-case scenario of 210,000-315,000 additional deaths in the space of 15 weeks<sup>84</sup> but not the protracted nature of infection long-term impacts and mortality experienced during Covid-19.

These types of issues have also been described as 'failures of foresight' which refers to the inability '*to plan and think systematically about future scenarios in order to inform decision-making in the present.*'<sup>85</sup> In this model the phrase Failures of Imagination is adopted to encompass both this systematic use of prediction to inform preparedness and the need to engage people in the creative generation and application of mental ideas and images associated with potential scenarios.<sup>86</sup>

Failures of Imagination can, therefore, be broadly referred to as:

- Absent or inadequate creation of meaningful, imaginative opportunities to consider, explore and exercise for future threats.
- Absent or inadequate perception of changes in the threat environment resulting in failures to update futures thinking and mitigate associated risk.
- Absent or inadequate attention to new and/or existing threats and impacts due to distraction or overt focus on present goals and concerns.

#### 4.3.2 Failures of Identification

Failures of identification refer to the problem of perceiving or identifying what lesson(s) need to be learnt. With hundreds of recommendations and lessons identified from years of major incidents and disasters in the public domain, this type of failure may appear to be rarer than others. There are two possible explanations for this. First, language and direction in current policy and best-practice guidance on the lessons learned process emphasises and, in some cases, institutes the inclusion of lessons identified or recommendations in the production of crisis exercise and major incident reports.<sup>87</sup> Consequently, the identification process tends to be more systematic and accountable. Secondly, the human brain is designed to identify inconsistencies and errors. This stems from the fact that the brain is always making implicit



predictions about what will happen next, to foster an internal sense of certainty about the future and assess upcoming behavioural requirements. As a result, people develop expectations based on their beliefs and knowledge about the way someone or something should happen and can register an error or conflict when expectation and reality do not converge.<sup>88</sup> In combination, the administrative processes involved in lesson identification and the inclination of the brain to detect conflict and error may be working hand in hand, resulting in a more consistent and evident ability to identify lessons than to apply them actively.

Despite these positive factors in lesson identification, we know that many lessons identified in the UK repeatedly surface in subsequent disasters. By reaching across into Safety Science research, this can be taken to indicate that failures of identification are more of an issue that they appear. Research in high-hazard settings finds that the *'repetition of events usually indicates that the fundamental cause or causes of the problem were not identified properly.'*<sup>89</sup> Lesson identification, therefore, carries the risk that the 'right' lessons are missed or miscomprehended. This can potentially lead to the development of a learning process that attempts to address a proxy problem without taking a deeper dive into the issue and addressing the root of problem.

Failures of Identification can therefore be referred to as:

- Failures to identify the right lesson(s) due to faulty assumptions, inadequate investigation into an incident, or an unwillingness to examine and address enduring sub-surface issues that underlie issues arising.
- Failures to recognise and/or draw out the specific and applied relevance of broader, overarching lessons at the individual, organisational level, for example where national lessons have local implications.
- Failures to recognise that specific, organisational lessons have isomorphic qualities that apply across stakeholders and could be 'passed up' or 'passed across' to enhance wider preparedness capabilities and build increasingly resilience industries.

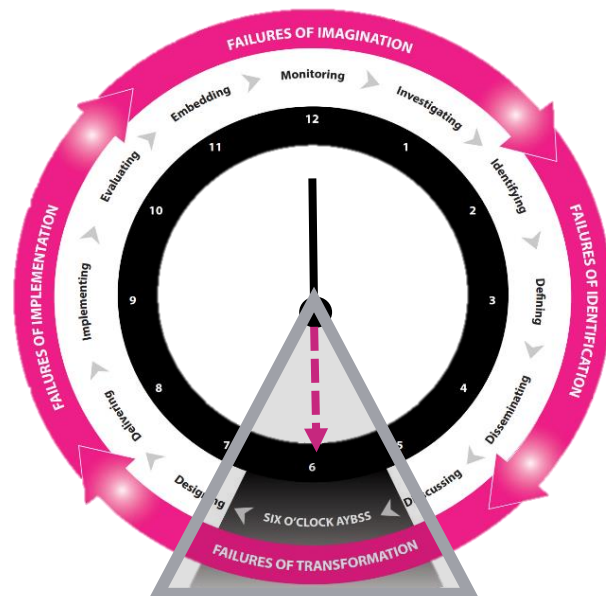
### **4.3.3 Failures of Transformation**

Failures of transformation get to the heart of the challenge in changing lessons identified into lessons learnt. This type of failure can occur at any point in the lesson learned cycle but the risk maybe particularly significant around the 6 o'clock point on the clock-face diagram as this represents the crux of the change process. This is the time when administrative activity and discussion conclude to make way for the heavy lifting of practically transforming past experience into future preparedness.

Transformation is the process of moving or changing something from where it is to where it needs to be. In the lessons learned context this makes the process of transformation a practical, strategic hazard adaptation, designed to mitigate an identified vulnerability. Initially, it requires relevant stakeholders to move from a place of ‘passive learning’ and ‘active learning’. Respectively, these two types of learning have been defined by Toft and Reynolds (2005) as ‘knowing’ about something, and ‘*knowing about something, and then taking remedial action to rectify the deficiencies that have been uncovered.*’<sup>90</sup> The difference between the two was illustrated in their book using the case of the NASA space shuttle Challenger which was passively known to be compromised when launching in colder temperatures due to issues with the now infamous ‘O rings’ but not actively rectified ahead of the shuttle’s fatal launch in 1986. Clearly, lives can quite literally depend on this critical transition between passive and active learning which (as will be explored in Section 4) can then be progressed further through co-operative and collaborative methods to achieve consolidation and integration within and between stakeholders.

The risk of lesson loss, degradation or stagnation in learning between lesson identification and implementation may be heightened around the 6 o’clock point on the lessons learned cycle. It can be suggested that this is due to the simultaneous requirements for individuals and organisations to embrace and navigate change and the need to designing effective, psychologically informed programmes that promote learning progression. When the challenge in either regard proves difficult to overcome, this model proposes lessons identified run the risk of falling into a sort of ‘6 o’clock abyss’, based on position of transformation failures on the clock face, and the fact that lessons seemingly lost to it rarely resurface until the next disaster and investigation begins. (Figure 5)

In summary, Failures of Transformation include:



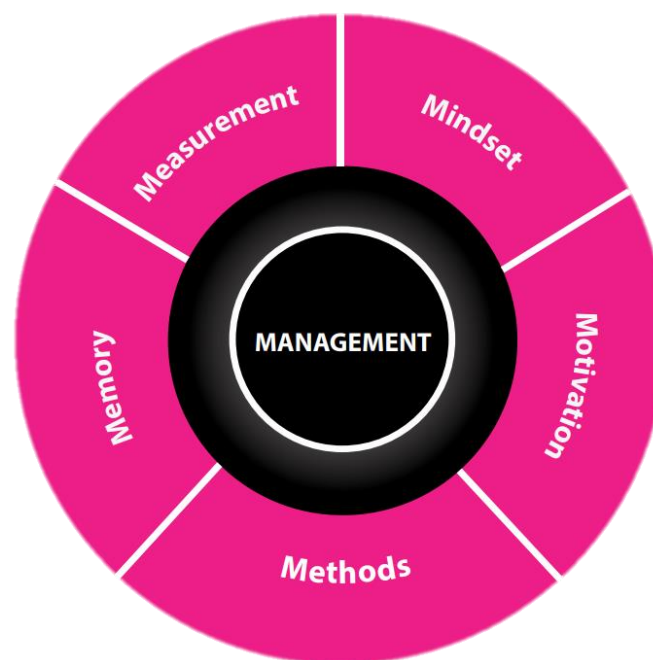
**Figure 5:** The 6 o’clock abyss

*A representation of the risk of lesson loss or degradation between processes of identification and implementation on the lessons learned cycle.*

- Failure to identify or accept the need for change and/or effectively engage others in the process of change to embed learning.
- Mistaking passive, perceptual learning for active learning due to familiarisation with key lessons and/or normalisation of identified risk.
- Failing to progress learning along the transformation continuum, resulting in stunted or 'insufficient' learning due to failures or inadequate use of active, co-operative and collaborative teaching and training.

#### 4.3.4 Failures of Implementation

Failures of implementation result from issues that limit or constrain the active learning process. This paper proposes that key constraints in learning from major incidents and disasters can be attributed to one (or more) of the Six M's: Management; Mindset; Motivation; Methods; Memory and Measurement. (Figure 6)



**Figure 6: The Six M's**

*Psychological perspectives on the limitations and constraints in learning lessons from major incidents and disasters.*

These potentially limiting factors have been placed at the heart of the cycle on the basis that they can undermine progression of learning at any stage, and are as follows:

## **4.4 CONSTRAINTS AND OPPORTUNITIES IN LEARNING: THE SIX M'S**

### **4.4.1 Management**

*'Board-level involvement is an essential part of the 21st Century trading ethic. Attitudes to health and safety are determined by the bosses, not the organisation's size.'*<sup>91</sup>

Leadership and management sit at the heart of the limitations and constraints in organisational and individual learning. This is because corporate attitudes and beliefs associated with learning, such as the importance given to a lessons learned process and its efficacy in achieving change, set the psychosocial tone for the engagement with, and management of, learning across the organisation. In other words, leaders and managers are responsible for determining and demonstrating the learning culture they want others to carry. They also influence key decisions about learning and development more generally, such as how much resource (human and financial) is allocated to achieving or improving outcomes in this area. Accountable management structures also provide systematic oversight of programme deliverables, individual and team learning progression and, ultimately, whether the required actions drawn-out from lessons identified are implemented at all.

Given the wider societal importance and implications of insufficient learning from major incidents and disasters, it may be helpful to consider the task of leading and managing the lessons learned cycle in the context of 'Health and Safety', rather than 'Learning and Development'. This might influence perspectives on the importance of the process and support a case for the inclusion of lessons learned aspects as integral in daily, internal operations rather than something additional to address when things have not gone plan during an adverse event.

### **4.4.2 Mindset**

*'The future is commonly viewed as something to be managed and planned for rather than something to be actively shaped. The aim is not just to confront new challenges, but also to imagine and create a world for all. The future is a set of 'imaginative, material and political processes already in development, in which it is both possible and ethical to seek to intervene.'*

<sup>92</sup>

The word 'mindset' describes the set of beliefs and attitudes that shape how a person thinks about themselves and the world around them. In addition to the wider influence of these aspects amongst leadership and management, mindset can also create a learning limitation within and across individual team members.

According to leading work of Stanford psychologist Dr Carol Dweck, our mindsets fall into one of two categories: 'fixed' or 'growth'.<sup>93</sup> People with a fixed mindset believe that character, intelligence and abilities are static and unchanging. People with a growth mindset believe that these things can be changed, shaped and strengthened throughout the lifespan. Interestingly, those with a growth mindset – who believe that change and growth is possible through application and experience – tend to experience greater successes and achieve improved learning outcomes when compared to those of a fixed mindset.<sup>94</sup> This means that when it comes to learning lessons from major incidents and disasters, everybody's perceptions, perspectives, beliefs and attitudes towards the process matter. Promoting a growth mindset amongst individuals and wider teams supports persistence in the face challenges and obstacles, gives meaning to effort, fosters a perspective that sees failures as opportunities for growth, and considers excellence in the learning of lessons as inspirational. In the absence of a commitment to grow, implementation efforts may be undermined by an unwillingness to change, constraining the potential for new knowledge and skills to be adopted, applied and effect change.

#### **4.4.3 Motivation**

*'The better we can understand what energises and directs us to behave in particular ways, the better we can arrange things to make our actions more adaptive: avoiding harmful behaviours ... and promoting behaviours that benefit ourselves or society.'*<sup>95</sup>

It has been suggested that motivation is the first step in the learning process<sup>96</sup>. However, some research demonstrates that it is possible to learn in a demotivated state and that internal motivation does not always predict the attainment of learning goals.<sup>97</sup> This means that motivation does not *cause* learning. What it does do, however, is support progress towards learning goals, influence how people respond to a learning experience and play a key role in achieving behaviour change.<sup>98</sup> This makes understanding what might motivate or demotivate people to engage with learning lessons from disasters important. Three key aspects that may influence motivation in this context include:

1. Perception of Risk: a strong perception of risk can increase motivation to make necessary hazard adaptations or learn in response to mistakes.
2. Threat and Reward: Perceptions of personal or departmental threat and reward in the workplace, such as the negative use of blame or positive recognition, can influence an individual's approach and motivation towards learning.<sup>99</sup>

3. Control and Application: Clearly articulating the applicability of learning from the past in the present and providing self-directed learning opportunities that afford people some control and responsibility for achieving learning goals have been shown to support motivation amongst adult learners.<sup>100</sup>

#### 4.4.4 Methods

*'...one of the key messages from psychology is the benefit of testing for recall rather than merely familiarizing yourself with material, which seems to create overconfidence.'*<sup>101</sup>

Learning methods refer to the practical ways in which efforts to increase or improve knowledge skills and capabilities are implemented. In the lessons learned context, various methods can be applied at either the individual and/or organisational levels. These include:

- Teaching – imparting knowledge.
- Training – equipping with applied knowledge and practical skills.
- Exercising – rehearsing knowledge and skills to develop capabilities, confidence and professional mastery.
- Testing – assessing the quality, performance, or reliability of knowledge, skills and capabilities in various environments.

The literature and expertise available on methods and practice in teaching (referred to as pedagogy or sometimes andragogy in the adult learning context) and the science and design of learning are extensive and interdisciplinary.<sup>102</sup> However, given the persistent challenge of achieving sufficient learning from major incidents and disasters, it seems plausible that this wealth of knowledge remains inadequately accessed and/or inconsistently applied to support improved learning in the preparedness context. This assumption can be supported according to the persistent issues with 'inadequate training' and a 'failure to learn' as identified in the Pollock Review.

Each of the methods listed have their own purpose and benefits as part of an integrated approach to learning in an organisation. However, assuming it is prefaced by the other methods, testing can have particularly significant psychological benefits for individuals and groups of learners.<sup>103</sup> This is because it requires the recollection and articulation of previous learning (whether in word or action) which help to strengthen and retain connections and memories associated with a particular learning outcome.

When coupled with practical exercising, testing can be a doubly useful endeavour because the term can be applied as a direct action and a descriptor of activity. This means that, in line with the definitions below, explicit 'testing' (verb) can be used to provide quality control,

requiring individuals to articulate and reliably demonstrate learning. Secondly, it can be used to place learners in a deliberately 'testing' (adjective) situations that will raise stress levels within reasonable limits to challenge their capabilities.

1. **Testing (verb)** *'take measures to check the quality, performance, or reliability of (something), especially before putting it into widespread use or practice'*.
2. **Testing (adjective)** *'revealing a person's capabilities by putting them under strain'*.

In the absence of testing elements, there may be less ownership and accountability associated with individual learning goals. At the group or organisation level, a failure to test as part of a wider monitoring and evaluation framework will mean that progress towards collective learning aims cannot be reliably tracked. As such, testing provides an essential but sometimes overlooked or under-used opportunity to embed learning, as well as apply periodic checks and balances on the effectiveness of any lessons learned process.

#### 4.4.5 Memory

*'...institutional memory affects an organisation's ability to both prevent the repetition of errors and increase operational effectiveness'.<sup>104</sup>*

As in the case of motivation, memory and learning are not synonymous. However, our ability to learn relies heavily on internal memory processes to retain, rehearse and recall information acquired during teaching, training and real-world experience. Therefore, the development of a wider institutional memory for lessons learned from adverse experiences relies in part on the embedded learning held in individual memories across the organisation. Consequently, memory should be a core psychological consideration when preparing for and practically delivering the implementation phase of the cycle.

As the human brain is a limited capacity processor, the requirement for memory in learning places some 'natural' constraints and limitations on different aspects of the process, for example, the amount of information people can reasonably absorb during a training day. In addition, all learning carries inherent risks of individual and institutional forgetting. This may be a more significant risk than many appreciate as a seminal study on the ability of people to retain arbitrary information demonstrated that people stand to lose 42% of what they have learnt in 20 minutes, 67% in 24 hours and 79% in one month<sup>105</sup>. Whilst not necessarily generalisable across all learning scenarios, these percentages provide a helpful reminder that the process of planting learning in long-term memories of individuals and organisations is likely to require more effort than perhaps hoped or expected. It is also a reminder that lessons previously learnt, such as those relating to the retention of emergency plans and procedures,

must be regularly revisited to mitigate the risk of learning decay which can then negatively impact confidence and competence when disaster strikes.

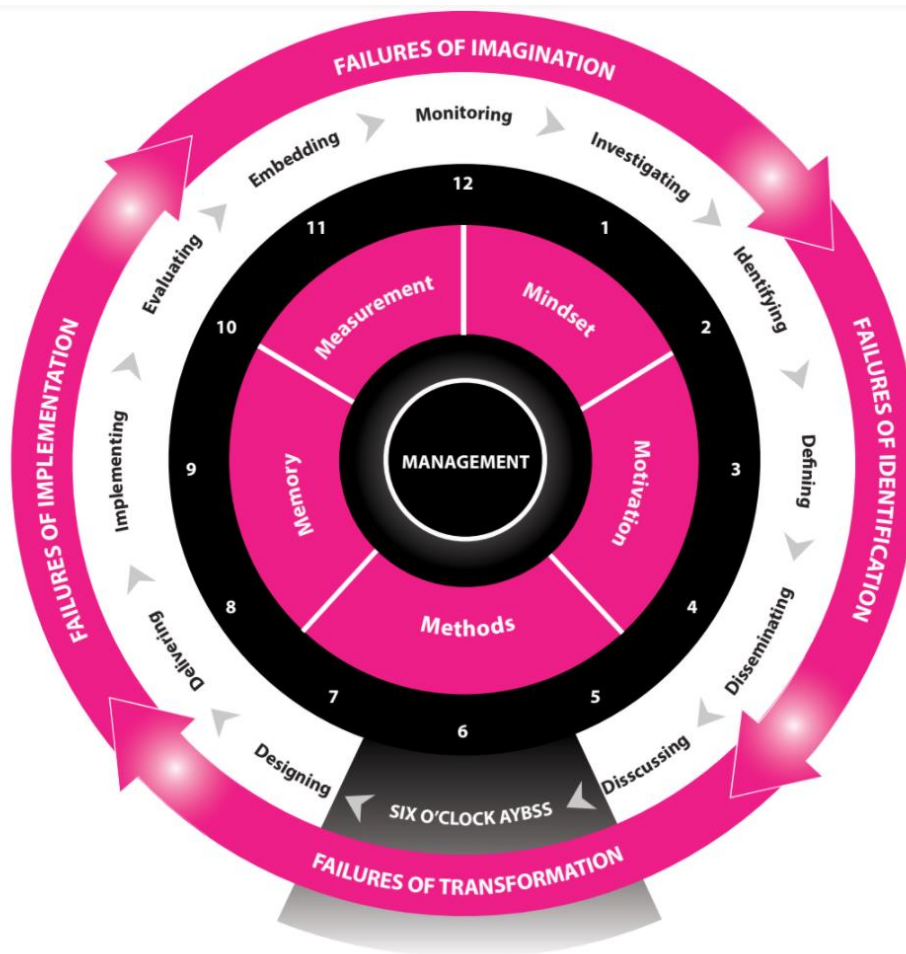
#### **4.4.6 Measurement**

In the inaugural paper on strategic preparedness issues, the National Preparedness Commission defines preparedness as ‘*a very concrete evidence-based set of actions that are taken as precautionary measures in anticipation of potential crises or disasters.*’<sup>106</sup> By this definition, the act of preparing should produce measurable change which in terms of the lessons learned process means actively tracking and accounting for learning progress rather than waiting to see whether mistakes of the past repeat themselves. This would also align with recommendations in the SENDAI International Framework for Disaster Risk Reduction, which states that risk reduction policies should ‘*...define goals and objectives across different timescales and with concrete targets, indicators and time frames.*’<sup>107</sup>

Indicators of learning progress and achievement of learning outcomes require monitoring at both individual and organisational levels. However, according to the Pollock Review, the absence of a ‘monitoring or audit mechanism’ for learning remains a persistent issue in the lessons learned process.<sup>108</sup> At the individual level, the importance of measuring change is covered largely in the act of testing as discussed. However, predetermined measures could be used to determine whether key learning objectives are internally understood, can be externally articulated, and/or practically demonstrated through co-operative and collaborative application. Corporate monitoring is equally essential to capture indicators of progress and determine whether learning is being embedded in organisations. By predetermining and applying appropriate and proportionate measurement in the lessons learned context, organisations not only benefit from more accurately assessing the knowledge, skill and competence of individuals but also have the opportunity to track progression in learning attitudes, activities and collective preparedness improvements at the strategic level.

In summary, the Six M’s complete the integrated, visual representation of the lessons learned cycle, including active process stages, four common failures and six central psychological components that can present limitations and opportunities across the learning cycle.





**Figure 7:** *The Lessons Learned Cycle (Roast, 2021).*

Failures of Implementation across the Six M's include:

1. Failure to lead learning and manage the change involved in the lessons learned process from the top-down.
2. Failure to adopt and develop positive mindsets about the potential to practically achieve learning goals at both individual and corporate levels.
3. Failure to foster informed perceptions of risk, a positive learning environment or an understanding of how past learning applies in the present.
4. Failure to adopt and apply an informed, engaging approach to learning design that recognises the limitations of learners and the opportunities to maximise outcomes.
5. Failure to repeat and retain learning from adverse events at individual or institutional levels.

6. Failure to measure and monitor progress towards the achievement of key learning outcomes due to the absence of a robust monitoring and evaluation framework or a preoccupation with measuring other proxy indicators, such as 'number of training session delivered'.

## 5 CASE STUDY: PSYCHOLOGICAL LIMITATIONS IN LEARNING — THE MAN WITHOUT A MEMORY

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<sup>109</sup>The story of Henry Molaison was one that made a lasting memory across the psychological disciplines. In 1953 Henry, or patient H.M. as he was anonymously known for many years, underwent brain surgery to try and curb unrelenting epileptic seizures which had left him with a very poor quality of life<sup>110</sup>. During the operation a small area of brain was removed, including parts of a neural structure called the hippocampus, which is now known to play a key role in human memory formation. As he recovered



from the operation, it became clear the procedure had successfully brought his seizures under control. However, the surgery had left Henry with an additional, entirely unexpected and devastating outcome: he had lost the ability to form new memories. Over the five decades of observation and enquiry that followed, the extent of his impairment became

***“Every day is alone in itself... at this moment everything looks clear to me, but what happened just before? That’s what worries me. It’s like waking from a dream; I just don’t remember”.***

(Milner, 1970, p37.)

clear. Henry could remember past events and people that he knew prior to the operation but not anything that happened or anyone he met thereafter. He could attend to new information, hold a conversation in the present, complete directed tasks, and – with the opportunity to continually rehearse it over and over – remember some things for up to 15 minutes. But a second’s distraction and it was all gone. His inability to form new memories seriously impacted his ability to learn. And when he did show some improvements in tasks that he had been given previously, he could never remember having seen them

before.<sup>111</sup>

Thankfully, Henry did go on to live a reasonably well-adjusted life, demonstrating an unimpaired sense of humour, enjoying television shows and the repeated reading of books and magazines. Clinically, however, the damage was irreparable and Henry spent the rest of his life in the perpetual present. By the time he died in 2008, Henry had ‘*inaugurated the modern era of memory research*’, leaving an unprecedented legacy in our understanding of

the neural basis of memory and the critical role that it plays in the learning process<sup>112</sup>. Today, Henry's story serves as a poignant reminder that the ability to access memories past and use memory structures to achieve learning can be a privilege taken for granted. Where the ability to harness human memories and learn from them exists, and that ability can be used to protect lives it should not be overlooked or under-utilised.

## 6 APPLYING PSYCHOLOGICAL PERSPECTIVES TO SUPPORT THE LESSONS LEARNED PROCESS

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This section considers how psychological perspectives can be applied in policy, pedagogy and practice to improve the lessons learned cycle and help to mitigate the process failures. This is outworked using be considering practical aspects associated with each of the Six M's that can limit or constrain learning at any stage of the lessons learned cycle. Key messages in each case are summarised in Figure 8.

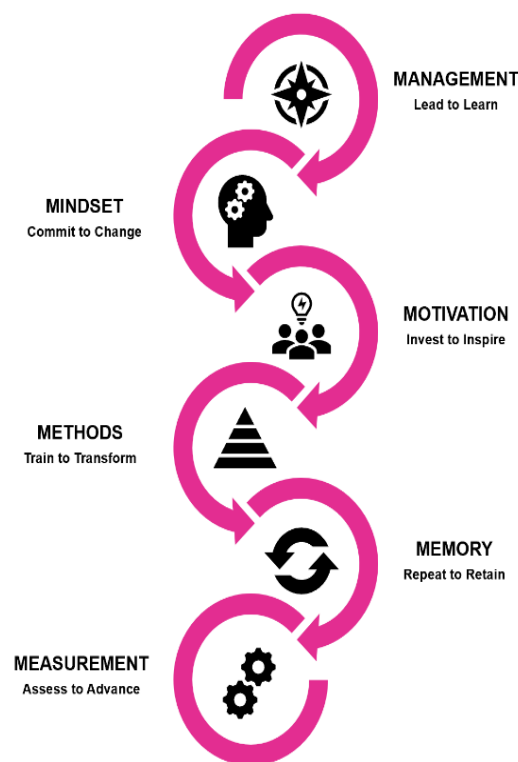


Figure 8: Key messages associated with the Six M's

### 6.1 MANAGEMENT

Leadership and management set the organisational atmosphere for learning from adverse events. They are also practically responsible for the provision of structural frameworks and policy to guide the process. Specifically, organisations are responsible for:<sup>113</sup>

- Providing strategic leadership for learning.
- Establishing systems to capture and share learning.
- Ensuring sufficient resource to achieve learning goals.

- Connecting the organisation to its environment which provides context and application for that learning.

Therefore, learning from major incidents and disasters must be actively and effectively *led*.<sup>114</sup>

Figure 1. Nomological Network of the Dimensions of Learning Organization and Performance Outcomes

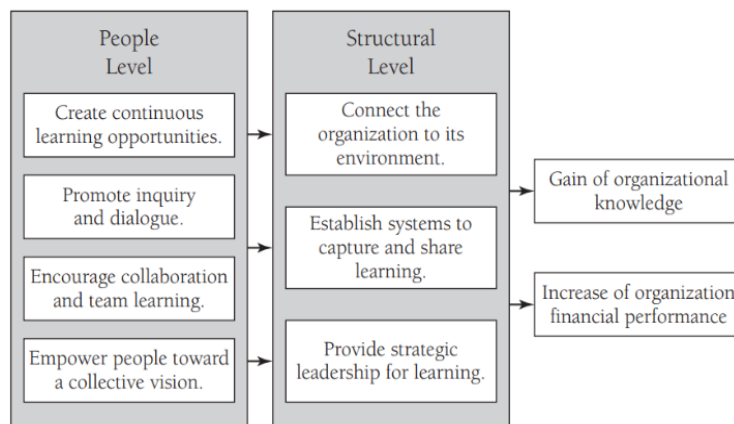


Figure 9: Taken from Yang, Watkins, Marsick, 2004, p41.

A robust commitment to both wider learning and the responsibility for the lessons learned process should be evident and embedded at the board and senior management levels. As learning involves a range of active processes that will need to be overseen, this same commitment to the process should also be evident across individuals operating in line management roles.<sup>115</sup>

The benefits of an active, engaged senior management team that leads learning from the top has been demonstrated in the Health and Safety context. For example, in their publication 'Leading Health and Safety at Work' which provides actions for directors, board members, business owners and organisations of all sizes, HSE demonstrates how a management emphasis on safety processes, coupled with positive workforce engagement and effective leadership when implementing systematic safety procedures can lead to significant reductions in workplace injury and absence, and ultimately financial savings.<sup>116</sup>

### RECOMMENDATIONS: POLICY

1. The lessons learned process is fundamental to the protection of people and place in the UK. It also plays a key role in the achievement of larger resilience goals. Legislation and best-practice guidance frameworks should be designed to afford the process sufficient priority and consistent accountability in the civil-contingencies context.

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2. Learning organisations are those that '*facilitate the learning of all of its members*' and continuously transform themselves to meet strategic goals.<sup>117</sup> As such any organisation committed to building better resilience should embed strategic policy, procedure and accountability for the learning of lessons from adverse events.<sup>118</sup>
  3. Clearly defined roles, responsibilities and lines of accountability for identifying lessons, implementing active processes and achieving learning outcomes should be evident at every level to drive required changes following a major incident.

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### RECOMMENDATION: PEDAGOGY

The presence of a positive learning culture in an organisation can be an indicator of a wider, maturing safety culture in which the risk of repeating past mistakes is typically reduced. Existing academic frameworks can be practically applied by organisations to assess progress towards becoming an effective 'learning organisation'. For example, current strengths and weaknesses in learning can be assessed using a measure developed by Watkins and Marsick (2004), which assesses progress across seven key dimensions including: continuous learning, dialogue and inquiry, team learning, empowerment, embedded systems, system connection and strategic leadership, current and future learning levels.<sup>119</sup> Further information on Safety (and learning) cultures can be found on the Health and Safety Executive's website:

<https://www.hse.gov.uk/foi/internalops/fod/inspect/mast/safetychecklist.htm>

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### RECOMMENDATION: PRACTICE

In an article for Harvard Business Review, Garvin and colleagues emphasise that 'organizational learning is strongly influenced by the behaviour of leaders'.<sup>120</sup> Leadership signalling and behaviours that encourage others to learn include: the practice of actively engaging with and listening to employees, proactive communication regarding the importance of transforming passive knowledge into active learning, demonstrating an openness to new ideas, encouraging people to offer alternative points of view, and promoting reflective working practice. In consistent combination, these factors can increase levels of 'psychological safety' in the workplace which means that people are more likely to share ideas and raise concerns over risks without the fear of blame.<sup>121</sup>

## 6.2 MINDSET

Managing transformative changes in an organisational setting can be difficult. This is because 'significant organisational change or layers and layers of small changes are seen by our brains as a threat'.<sup>122</sup> As perceptions of threat can induce feelings of stress, uncertainty and anxiety, people may be naturally resistant to change, preferring to maintain the status quo or find a quick-fix solution rather than instigate the wider organisational change sometimes needed to address persistent problems. This might especially be the case if individuals or groups manifest a 'fixed mindset', which as Figure 10 demonstrates, can create a preference to avoid challenge, change, effort and criticism.

Fostering a growth mindset at the individual and organisational level can be a positive, cost-effective way of re-framing change. This is because it can support individuals to reappraise (or take a new perspective) on change that views the process as a 'challenge to be embraced' rather than a 'threat'. It is an important skill to develop, because stress induced by the threat response can cause the suppression of a neurochemical called dopamine which plays a key supporting role in learning and motivation.

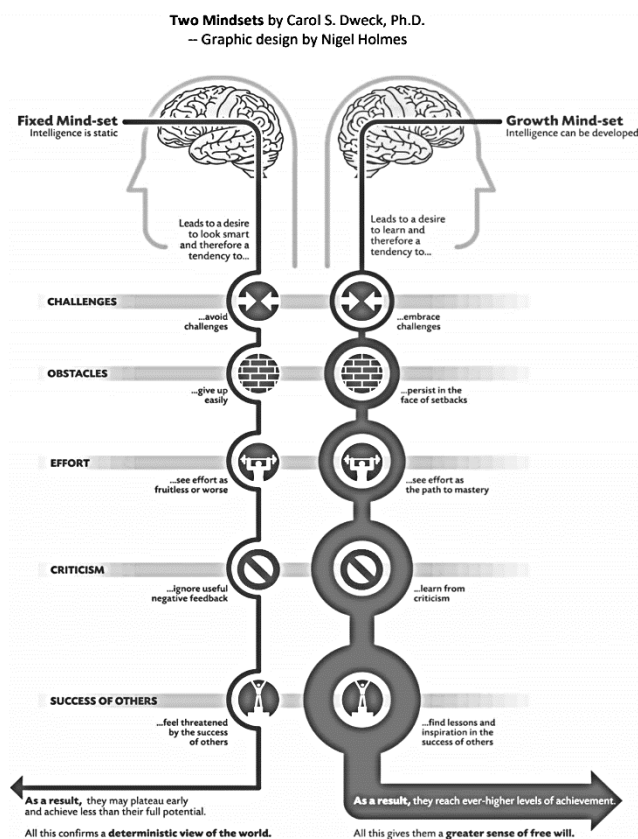


Figure 10: Design: Nigel Holmes, in Dweck, C. (2006). *Mindset: The New Psychology of Success*.

A growth mindset is available to all, can be taught and is supported by neuroscientific research, which demonstrates the 'neuroplastic' or malleable nature of the brain in response to experience and learning.<sup>123</sup> The presence and development of a growth mindset may also help to mitigate failures of imagination as it can help to release individual potential and support approaches that embrace challenge and change.



## RECOMMENDATIONS: POLICY

1. More is currently known about the learning problem than the best-practice solutions for addressing it in the civil-contingencies' context. Where nations, institutions and organisations demonstrate excellence in learning from incidents, accidents and disasters, the UK should be inspired, collating expertise and experience to develop innovative, psychologically informed, world-class solutions. A review of factors that influence 'Good to Great' progression learning from major incidents in wider settings, such as healthcare or industries managing major accident hazards, could help to connect the dots across domains to reduce risk and improve preparedness.
2. This paper has presented the lessons learned process as a 'wicked problem'. This means that innovative research and policy making should be cultivated to inspire new solutions to address the problem at all levels.

## RECOMMENDATIONS: PEDAGOGY

1. A growth mindset can be taught to individuals, fostered within a lessons learned programme, or developed across an organisation more generally to inform changes in learning culture. Just telling people about the brain's ability to change and adapt or informing learners about the benefits of a growth mindset can shift perspectives on the engaging with learning content and the development of new skills. Consider building in opportunities to teach or remind learners about the importance of a growth mindset, perhaps during the induction process, at the beginning of a training session or within the context of a team meeting. It can also be useful to ask people to recall a time when they have overcome an obstacle in the workplace or in their personal life and consider or share how they navigated that process to achieve a positive outcome.
2. For any interested in further reading on the practical integration of psychological and neuroscience perspectives to inform organisational change, the following book from Hillary Scarlett provides an excellent synthesis of applied research:  
<https://www.koganpage.com/product/neuroscience-for-organizational-change-9780749493189>

## RECOMMENDATIONS: PRACTICE

1. Reimagining failures as learning opportunities can be challenging, especially when decisions carry serious consequences, and/or a blame culture is present. But when failure is reframed as an opportunity for growth, there is significant scope for learning. This is supported by studies that demonstrate the ability of learners who 'fail' at a task, receive feedback and have the opportunity to correct their response, to go on to and build stronger, richer neural connections than those who actually got it right first time. It is, therefore, important to do two things in practice: a) create practical learning opportunities such as co-operative table-top scenarios and collaborative training exercises which deliberately predispose individuals to 'failure' and provide subsequent opportunities to correct mistakes. This fosters experiences of failure in a safe environment and allows experiences of failure to be fed back into the lessons learned cycle; and b) always provide constructive feedback and explain the correct or desired actions at an individual and team level following testing. This adds meaning to the 'failure' and provides a vital ingredient for improved progression next time.
  2. At the organisational policy level, consider using the quote below to stimulate a discussion-based activity during a meeting with policy and/or senior team members: *'The future is commonly viewed as something to be managed and planned for rather than something to be actively shaped. The aim is not just to confront new challenges, but also to imagine and create a world for all.'*<sup>124</sup> Encourage participants to consider and reflect on how their own beliefs, values and attitudes towards the lessons learned process might have shaped current individual and organisational mindset towards achieving measurable change and improved preparedness. Ask groups to feedback and use the finds to inform the develop further training and communications regarding the process and positive opportunities it offers for change.
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## 6.3 MOTIVATION

Those with responsibility for a lessons learned programme should always seek to underpin and improve motivation amongst learners because it plays a significant role in supporting engagement with learning activities and the achievement of behaviour change.

It is especially important to consider motivational aspects in associated with learning from adversity because some of the usual workplace rewards may be less overt in the civil contingencies' context. For example, celebrating success in preparedness is very challenging, given that success is often silent (having perhaps unknowingly prevented a major incident) or pending following investment in future defences and safeguards against yet unrealised threats. When added to the frequency and demand of relatively minor incidents and issues occurring between major incidents and disasters, opportunities to foster any sense of reward and acknowledge positive progress (which would ordinarily support motivation in learners) in learning lessons from past events are understandably lacking.

In Section 3, three aspects that can influence motivation were highlighted. These included perceptions of risk, aspects associated with perceptions of threat and reward in the workplace, the need for learners to have opportunities for autonomy and to understand the immediate relevance and applicability of learning in the present. Although these aspects by no means cover the breadth of factors that can influence individual motivations, they do provide a starting point for applied practice and the following suggestions:

### RECOMMENDATIONS: POLICY

1. Policy activity can become removed from frontline response. Opportunities for connecting policy makers with the experiences of first responders and stories of victims or who have been directly involved and impacted by adverse events can be a powerful tool for motivational engagement. It can also strengthen learning associated with the event and inform innovative policy design.
2. New policy should be inclusive, authentic and grounded in the practical, lived experience of front-line workers to ensure the feasibility and acceptability of proposed changes.
3. When designing policy frameworks and best practice guidance at institutional or organisational levels, invest time in defining what success looks like in context at each

of the 11 stages of the lessons learned process. This enables those managing the process to identify a clear break-down of smaller goals associated with specific elements of the lesson learned cycle. Achieving these goals can then create opportunities for rewarding the progress of individual learners and team wins along the way. This can then inspire motivation for subsequent process activities.

## RECOMMENDATIONS: PEDAGOGY

1. When delivering teaching and training, invest in the design and integration of opportunities for self-directed learning in which learners can take some control (self-manage) and responsibility (self-control) for achieving learning goals rather than being exclusively directed in a lecture-style format.<sup>125</sup> This supports the individual psychological need for autonomy and affords individuals the time and space to develop their own learning which is typically more rewarding.<sup>126</sup> Examples include: the use of independent or small group problem-solving tasks; a request for learners to undertake independent research within a specified time scale and present findings to a line manager or the wider team; and the use of imaginative exercising techniques (for example, red teaming) in which learners adopt an alternative, adversarial role in a crisis scenario to develop increased understanding of vulnerabilities and risk from an alternative perspective.<sup>127</sup>
2. Rather than out-sourcing teaching and training associated with the lesson learned process, consider investing time to develop in-house learning expertise amongst interested employees. This can motivate advanced practitioners to engage in the development and delivery of meaningful, contextualised learning experiences which, in turn, supports even richer connections with associated knowledge across brain regions. Where it works, those in the earlier stages of their career stand to benefit from the experience of leaders and peers as the development of neural networks, memories and cognitive schema (mental scaffolds) is more advanced in practitioners with developed expertise compared to relative novices in context.

## RECOMMENDATIONS: PRACTICE

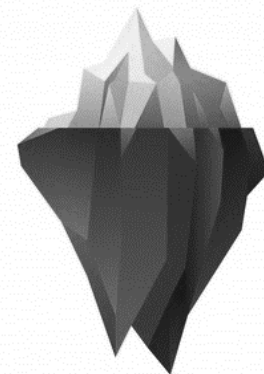
1. Integrate lived experience and stories, whether live or recorded, from the trainers themselves, peer practitioners or victims to support an understanding of real-world risks. This may engage areas of the brain involved in emotion which can then strengthen memories and enhance neural connections in learning. The same method can be used to show case stories where learning resulted in a positive impact in future practice.
2. The nature of preparedness activity requires an ability to delay present rewards in favour of future payoffs. Always identify and articulate how the delivery of learning directed at future preparedness integrates into present operations, to add meaning and avoid learner disengagement.

### 6.4 METHODS

Applied methods in the lessons learned process should be purposed to effectively transform lessons identified into lessons learnt through teaching, training, testing and exercising to achieve transformative change. Adopting a 'Train to Transform' approach helps to mitigate failures of identification, transformation and implementation by encouraging individuals and organisations to assess and articulate the change they want to achieve. Accordingly, practical considerations regarding methods are broken down into three parts: Train to Identify; Train to Transform, and Train to Implement.

#### TRAIN TO IDENTIFY

During the identification process there is a risk of: identifying lessons without interrogating the underlying assumptions on which they are based; failing to identify or prioritise the right lesson(s) to build actions on going forwards; and/or failing to acknowledge the implications of the type of lesson one has in hand to inform next steps. To illustrate how this can happen, Toft and Reynolds (2006) helpfully delineate between three types of lesson that may be identified as below:



**Iconic lessons** represent the broadest, overarching lessons, including those identified and grouped like for like in an executive report summary. Examples include lessons such as 'poor

communication', 'issues of interoperability' and 'failure to learn lessons'. To use an iceberg analogy, these lessons protrude above the surface and are easy to see but they may only be the tip of the problem. Practitioners working on the lesson identification process should be willing to do a deeper dive to tease out any potential learning below the surface. Focussing on iconic lessons in isolation allows an expert perspective on the 'ocean landscape' to develop, and can be easier to manage mentally but does not typically support a clearly articulated requirement for change.

**Isomorphic lessons** refer to lessons that are transferrable and could apply in a range of settings. The identification of an isomorphic lesson demonstrates that somebody has noticed shared features across 'icebergs' or peered beneath the surface to realise sub-surface similarities that can be leveraged across contexts to reduce risk, improve performance and strengthen inter-organisational resilience. Good examples include lessons of health and safety which can apply across society or lessons identified in one hospital that apply regionally.

**Specific lessons** refer to those identified as relating to a particular organisation. These lessons are equally essential to address when building resilience but tend to be more unique in their applicability, perhaps only relevant in specific settings or discrete, intra-organisational groups. An example of this might be seen in the case of a business that recognises the need to update its business continuity policy and the subsequent need to roll out refreshed training to staff.

This typology can be used to help determine what kind of lessons are emerging from inquiries, investigations or after-action reports by drawing out the associated iconic, isomorphic and specific learning associated with a broad lesson identified. Lessons can then be interrogated and underlying assumptions critically considered before those involved in planning a learning intervention draw out specific learning requirements that the lesson identified will place on the individual learners.

## **TRAIN TO TRANSFORM**

Once a lesson identified has been used to articulate a desired change in policy, practice or procedure, the planning triangle below can be used to support the breakdown of learning into meaningful, manageable chunks or goals that can be practically addressed. This part of the process also involves deliberately selecting and designing the correct learning intervention (or 'vehicle') to achieve the learning aim as well as ensuring that a chosen intervention will be acceptable and achievable given the time and resource available to them. Examples of learning interventions may include:<sup>128</sup>

- An education intervention, to impart new information and increase knowledge.
- A training intervention, to model actions and improve practical skills/performance.
- An enabling intervention, to reduce barriers in the working environment that decrease the likelihood of knowledge and/or skills being reliably applied and increase opportunities for the desired outcome to result.

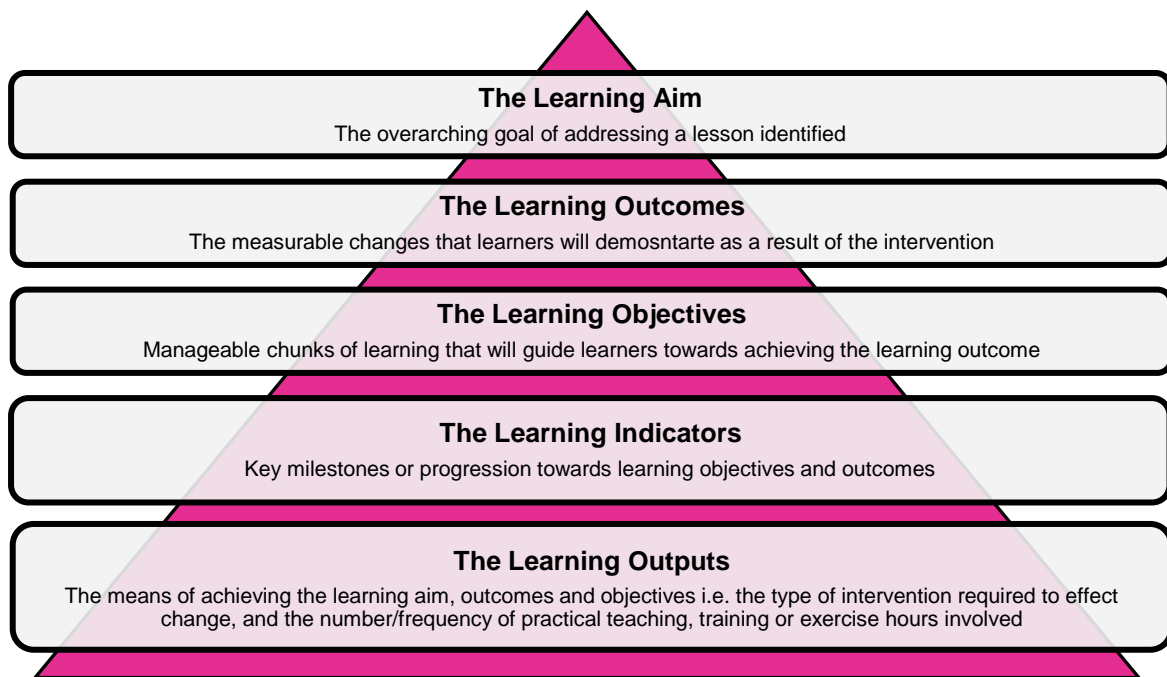


Figure 11: A planning pyramid to support lesson identification and learning design

## Further Information

Several practical and scientifically informed behaviour change models are available to support the design and examine the suitability of interventions to achieve the outcomes required. One behavioural model that has been used extensively in Public Health and local government settings is the Behaviour Change Wheel (Michie and West, 2016). Further details on the Behaviour Change, including application of The APEASE criteria for assessing interventions, intervention components and ideas to examine the Acceptability, Practicability, Effectiveness Affordability, Side-effects and Equity of an Intervention can be found at:

- <http://www.behaviourchangewheel.com/>
- [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/875385/PHEBI\\_Achieving\\_Behaviour\\_Change\\_Local\\_Government.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/875385/PHEBI_Achieving_Behaviour_Change_Local_Government.pdf)

## TRAIN TO IMPLEMENT

Implementation requires a transformative progression in learning along a continuum from passive ‘perceptual’ learning through to active application, co-operative consolidation and, finally, on to collaborative integration. This progression can help mitigate the risk of stagnated learning and lesson ‘loss’ at the 6 o’clock abyss. Every stage of this progression is important, including passive learning, because it creates the potential for action.<sup>129</sup> This progression can be visualised in Figure 12 below. A simple worked example of learning progression in communication is also provided:

Figure 12: A Proposed Transformative Learning Progression.

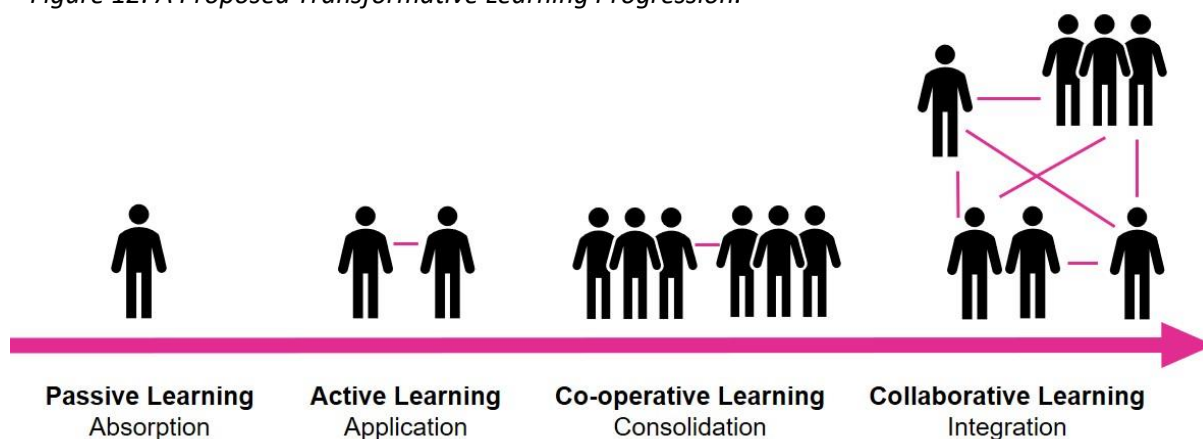


Figure 13: A Worked Example: Learning progression in JESIP Communication Protocol

| Passive Learning   | Active Learning   | Cooperative Learning   | Collaborative Learning  |
|--|---|--|---|
| <p>Knowing the M/ETHANE protocol for communication a major incident:</p> <p>Major incident Declared.<br/>Exact location.<br/>Type of incident<br/>Hazards.<br/>Number &amp; severity of casualties.<br/>Emergency services required.</p> | <p>Recalling the M/ETHANE protocol mnemonic from memory and practicing using it to relay information to colleagues during initial training.</p> | <p>Applying and rehearsing the M/ETHANE protocol in exercise scenarios and real major incidents to cooperate and achieve effectively intra-agency communication with colleagues.</p> | <p>Applying and rehearsing the M/ETHANE protocol in exercise scenarios and real major incidents to achieve effective inter-agency communication and collaboration with multiple stakeholders, to inform rich situational awareness, using shared meanings and symbols e.g. in hazard identification and casualty estimates.</p> |



The addition of co-operative techniques in which learners work together in small groups on focussed problem-solving activities, such as table-top exercises, further encourages the application of learning in context. This supports individuals to add associations and meaning to the learning which can be strengthened when rewards or positive recognition is available based on the group's performance.<sup>130</sup>

Finally, opportunities for collaborative learning (as seen in multi-agency exercising) that involves groups of learners, '*working together to solve a problem, complete a task, or create a product*' increase opportunities for contextualised learning application.<sup>131</sup> Co-operative and collaborative learning opportunities can be especially helpful from both a psychological perspective because the social information and interpersonal connections made when people share learning experiences can help to make learning stick.<sup>132</sup> From an emergency management perspective, they can also serve to develop relational capital, foster trust and support interagency communication.

### RECOMMENDATIONS: POLICY

1. Training to transform begins with the successful identification and articulation of the right lessons. This part of the process has been described as passive learning, and it puts transformative progress on the starting blocks. Failures of identification, therefore, undermine the transformative learning process. A consistent best-practice methodology for interrogating underlying assumptions in lesson identification and delineating different types of lessons is needed to ensure the right lessons are consistently identified, articulated and communicated
2. Lesson identification should draw on the widest possible experience and welcome diverse, critical perspectives from within and beyond the individual organisation to counter parochial practice and mindsets.

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### RECOMMENDATION: PEDAGOGY

At the individual level, learners can passively absorb learning through the dissemination and presentation of information such as that delivered via face-to-face lectures or online training. Active learning requires an individual to do something with that passive knowledge in order to progress the learning. Methods such as testing individuals on what they have absorbed using quick-fire, multiple-choice quizzes can be an under-utilised but

effective tool. Alternatively, individuals may be asked to actively demonstrate what they have learnt during an informal discussion with a supervisor or peer or in a practical training exercise.

### RECOMMENDATION: PRACTICE

1. Break down any lessons identified according to the typology from Toft and Reynolds, as outlined above, then apply the planning triangle to articulate key learning outcomes before deliberately designing a programme for how this can be achieved.
2. Consider using the APEASE grid to examine the suitability of proposed learning interventions

## 6.5 MEMORY

Memory is widely viewed as an information processing model with three elements of storage: the sensory memory store (SMS) which receives incoming information from the environment and can hold it for up to 3 seconds, the short-term memory store (STM) which has the capacity to hold between 5-9 items or 'chunks' of information<sup>133</sup> for approximately 15 seconds, and the long-term memory store (LTM) which can potentially retain an infinite amount of information indefinitely. However, a risk of forgetting spans all three memory stores. This means that if

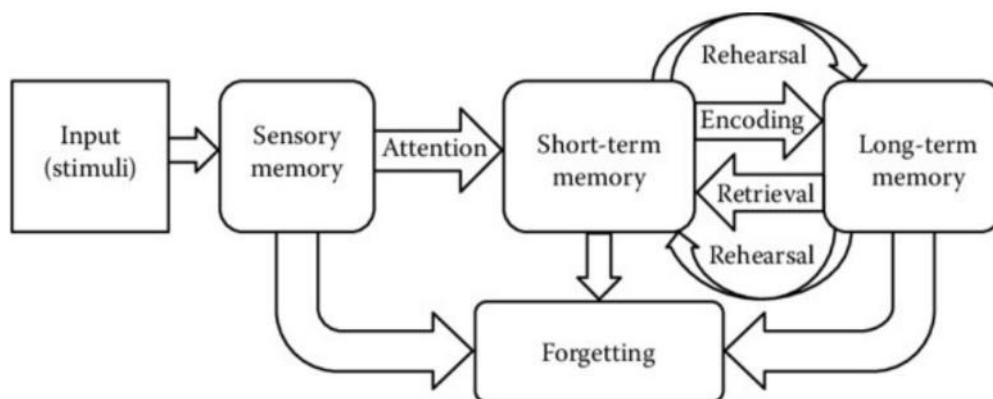


Figure 14: Atkinson and Shiffrin memory store model (From: Atkinson, R.C. and Shiffrin, R.M., 1968. *Human memory: A proposed system and its control processes*. In *Psychology of learning and motivation* (Vol. 2, pp. 89-195). Academic Press.)

information is not periodically retrieved, recalled or rehearsed failures of implementation can result. This has two consequences for the implementation phases.

First, those leading teaching and training initiatives must proactively design learning in a way that maximises the chances that learning will stick or in other words make it to the LTM. Several authors have come up with helpful mnemonics to support trainers in this endeavour. One example of this is found in the **LEARNS** example which highlights the ‘*six memory aids*’ to support ‘sticky learning’.<sup>134</sup> These include providing: **L**inks to real-life analogies and everyday activities; integrating **E**motional aspects in learning activities; **A**nchoring new learning in pre-existing knowledge; employing **R**epetition to retain information; providing **N**ovelty to capture attention via curiosity; and weaving in **S**taories that add meaning to the learning. Other models also highlight the importance of considering the constraints of human attention which is limited to approximately 20 minutes before needing to change focus, and the effectiveness of ‘spaced’ learning which builds in carefully calculated gaps to let new learning to be digested before recall is requested.<sup>135</sup>

Secondly, learning requires significant opportunities for recall and rehearsal. The impact that these reminders to recall learning can in mitigating the forgetting curve are significant, effectively reducing the loss of arbitrary information to just 10% when four reminders are applied over a two-month period (Figure 15).

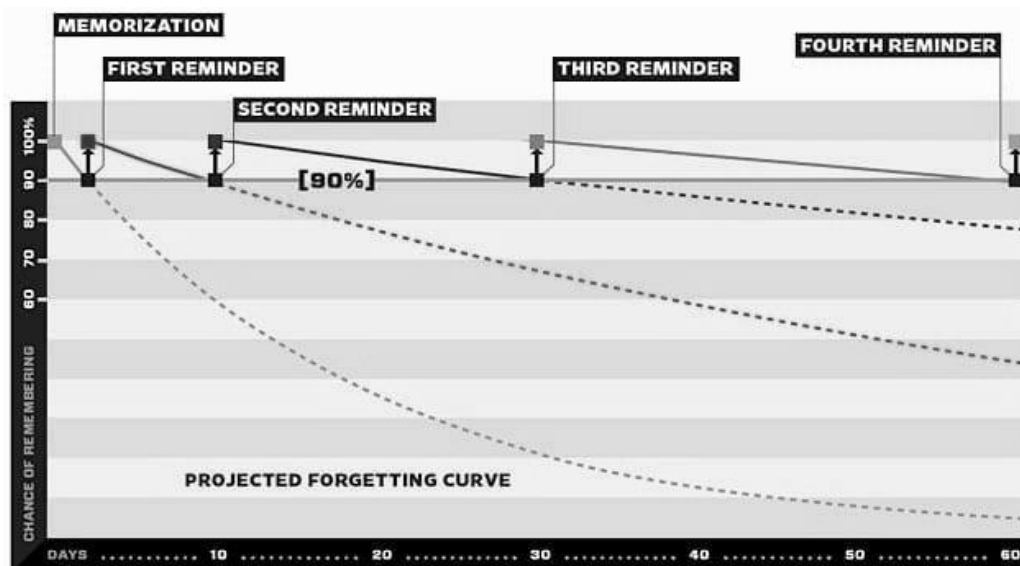


Figure 15: The Ebbinghaus Forgetting Curve (in Colins, 2019. Neuroscience for Learning and Development. London: Kogan Page)

Regularly testing and exercising people plans and procedures during the implementation phase of the lesson learned cycle provides a key opportunity for recall and rehearsal or

knowledge and skills. It is also an effective means of achieving richer information generation due to the opportunity to cooperate and collaborate with others during the exercise.<sup>136</sup>

To maximise the effectiveness of testing and exercising the emergency response, it should be prefaced with teaching and training. This means that jumping straight into to an exercise without progressing sequentially through the learning progressing in Figure 15 is not generally recommended. This is because testing and exercising places learners in a situation that is deliberately designed to raise stress levels within reasonable limits, and challenge individual capabilities. In the absence of pre-existing capabilities and knowledge of policies, plans and procedures, stress levels may be additionally increased and negatively impact the potential to achieve learning. The impact of this is clearly captured in the UK Cabinet Office best-practice guidance, which states:

*'Exercises are not the ideal training environment. Throwing untrained people into an exercise predisposes a plan to failure and may make it difficult to establish whether plans and procedures themselves are valid.'*<sup>137</sup>

Accordingly, testing and exercising is not a magic wand for retention but an essential, integral part of a planned learning progression, to support lesson implementation.

## RECOMMENDATIONS: POLICY

1. Policy regarding responsibility and best practice for testing and exercising the emergency response often cites periodic intervals between exercises of one to three years. This will be insufficient for embedding learning long term. Policy makers should set an expectation for increased frequency of smaller-scale crisis simulations. Whilst there remains an essential role for large-scale exercises, leading researchers in the field of decision-making suggest they are an inadequate substitute for the more frequent opportunities to practice skills: 'Decision-making, like any skill, is a matter of practice...too often, we rely on scale and immersion rather than frequency, resulting in an inability to apply the lessons learned when the scenario becomes real life'.<sup>138</sup>
2. Emergency plans and policies should be regularly revisited to improve retention or re-learned following updates and changes. Where lessons have isomorphic qualities that make learning applicable at both local and national levels, such as the safeguarding lessons identified following the tragic case of Victoria Climbié, an increase in the repetition and frequency of learning and re-learning for people in relevant roles

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should be instituted on a regular basis. In the case of changes to safeguarding, national and organisational policy has helped to build and embed national learning in individual and organisational memories.

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### RECOMMENDATIONS: PEDAGOGY

1. People are limited capacity processors.<sup>139</sup> This means that if information imparted during teaching and training is not periodically retrieved, recalled or rehearsed, failures of implementation can result.<sup>140</sup> An applied understanding of human aspects in teaching and learning, such cognitive processing, memory, decision-making and the development of expertise, will support improved learning outcomes
2. Design learning interventions with psychological needs and limitations in mind. Apply the LEARNS mnemonic to design effective materials and engaging activities that can help make learning stick. For example, consider trialling an online training intervention that involves 20 minutes of remote content every day for five days, rather than blocking out a two-hour training afternoon, and use an online survey or quiz at the end of the week to test retention and recall. The online aspect reduces issues of release from other activities to attend, the length suits naturally with individual attention capacity, the requirement to engage for five days in a row increases recall opportunities to mitigate forgetting, and the 24hrs of spacing between each session gives time for the learning to sink in.

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### RECOMMENDATION: PRACTICE

1. Capturing, storing and sustaining long-term institutional memory can be a notable challenge, especially when staff changes are frequent or turnover is high. Studies show that the development of institutional memory relies on both formal and informal learning processes. In addition to the use of technology to support lesson storage and digital retention, consider creating informal lessons learned activities, groups and networks that give people time to connect, share and discuss learning from adversity. This may spark new innovations and insights, as well as build relational capital across individuals and agencies.<sup>141</sup>

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2. When designing exercise scenarios, consider utilising a range of modern technologies, such as virtual reality, electronic exercising platforms and relevant simulation expertise to diversify exercise experiences and drive engagement.
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## 6.6 MEASUREMENT

The development of a robust monitoring and evaluation framework to assess measurable progress towards clearly articulated goals is an essential component of any change programme. It is also crucial in the lessons learned context.

Monitoring and measuring change is important from a psychological perspective because it provides feedback in response to associated efforts and activities, generating self-awareness around learning progress. This can help organisations to gauge how far they have come on the lessons learned 'clock' in the process cycle diagram or identify when learning has come unstuck. It can also be used to evaluate the efficacy of pilot programmes and processes *before* embedding them organisation wide. This means that learning must be assessed before an individual or organisation can advance. Where assessment is absent or lacking, gaps or inconsistencies in learning can go unchecked, creating weaknesses and vulnerabilities amongst individuals, in teams and across wider systems.

In line with the planning triangle, once learning outcomes, indicators and outputs have been determined, they can all be measured and assessed. However, it is important to remember that the outcomes represent the desired change in policy, individual attitudes, knowledge, skills and competencies. It can be easy to fall into a trap of measuring learning inputs (i.e. fiscal resource poured into learning programmes) and learning outputs (i.e. the number of activities or learning hours generated) that could be seen to indicate sufficient learning when in fact there is no record of personal performance improvements, transfer of learning into workplace procedures or real tangible progress in efforts to transform passive learning into active, cooperative or collaborative learning.

The difference between actual learning and the feeling of learning can also confuse matters during assessment. For example, in a recent study of learning comparing the use of passive lectures and active learning strategies, researchers found that students in the active learning group learnt more but felt that they had learnt less than in traditional lectures.<sup>142</sup> Similar discrepancies between perception of learning and actual performance were found in a study

comparing the effectiveness of a spaced learning intervention with cramming. Results showed that even though 90% of learners performed better after spaced learning, 72% still believed cramming was more effective. <sup>143</sup>

### **RECOMMENDATION: POLICY**

Provision for the robust monitoring, measurement and evaluation of learning activity should be evident at national and organisational levels. To support this, policy makers might consider where and with whom responsibility for the assessment of action and implementation of lessons from major incidents and disasters lies. Aspects of Learning and Development (L&D) Policy and Health and Safety management could be drawn upon to inform the development of a consistent, coherent assessment framework.

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### **RECOMMENDATIONS: PRACTICE**

1. A common, but sometimes misleading, way of evaluating training is to gather feedback from learners about what they enjoyed or how much they had learnt by the end of the session. Whilst this can be a helpful to gain insights about what the participants thought of the event or exercise, research suggests that learners' feelings about learning (perceptions) do not always correlate with actual learning in reality. The use of objective measures of learning will likely be more accurate than relying on learners' perceptions of it.
2. A range of methods can be applied to assess learning progress. These include, but are not limited to, standard testing, observations, professional performance reviews, the use of individual learning plans, interviews and the collation of qualitative data such as case-

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study reports. The method of measurement selected should relate to the learning aspects drawn down from the planning triangle.

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## 7 CASE STUDY: ACCOUNTABLE FOR CHANGE – MEASURING WHAT MATTERS IN THE VOLUNTARY SECTOR

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During the 1990s many charities lost substantial amounts of core funding as the sector landscape shifted towards contracting which meant that voluntary organisations had to be more accountable than ever. This involved becoming increasingly able to design projects that delivered real, measurable change or outcomes for the people involved. In the voluntary sector, outcomes refer to *'the effects of changes brought about by the activities undertaken by the organisation'*.<sup>144</sup> This is what funders wanted to invest in – projects that delivered measurable change for people that had a positive impact on local communities and that produced a social return on investment. The challenge was that success was often associated with outputs; for example, the number of community learning sessions delivered or the number of people who accessed an organisation's drop-in services. The focus had not been on measuring *outcomes* which, for example, indicate whether individuals involved are becoming less isolated and more confident as a result of engaging with a particular organisation or activity rather than just recording their attendance at a group session.

Conceptions of success had to be *un-learned* to make way for measuring what really mattered. For many organisations, this meant *re-learning* how to monitor and evaluate their services. Planning triangles, such as those used by the Charities Evaluations Services (CES), were used to support organisations to design activities with outcomes in mind. Some voluntary organisations also adopted the use of individual learning plans from the education sector to monitor individual progress in developing skills for employment, or progression in computer literacy. Organisations continued to gather a range of qualitative insights from focus groups and informal interviews to understand better the root causes of local community issues, how services could be shaped and how the beneficiaries thought change should be achieved.

***“our greatest fear should not be of failure but of succeeding at things in life that don't matter”.***

Francis Chan, 2021.

The ability to design for and measure change, was – and still is – essential to secure funding in the sector. However, many organisations have since found additional benefit of the outcomes approach: for example, they are often better placed to communicate their impact to wider stakeholders and to demonstrate the measurable outcomes that their services achieve to potential beneficiaries. In hindsight, the shift in thinking from outputs to outcomes caused many organisations to measure more meaningful change and demonstrate the

progress that mattered. One could say that the lesson that many charities in the voluntary sector have learnt is – if you want to change something, you have to be able to measure it.

## 8 CONCLUSION

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In summary, this paper reviewed persistent challenges in learning lessons from major incidents and disasters in the UK. It provided psychological perspectives on the lessons learned process and interwove these with existing concepts in crisis and disaster management to provide novel insights on a national challenge. In doing so, it was demonstrated that: human psychology can provide important insights into the challenges associated with lessons learned process; help to identify and deconstruct lessons identified; support an understanding of the learning and the learners involved; guide the identification of barriers to learning; and provide practical strategies for maximising the achievement of related learning goals. The importance of learning about learning and leveraging existing knowledge in this area to improve preparedness was also outlined in the context of global perspectives on human futures in learning.

In an increasingly interconnected world with known, evolving and currently inconceivable threats, it is now time to connect the dots between lived experience, academic expertise and industry domains in order to drive preparedness forwards. If we are united in a relentless pursuit to leverage the very learning that our brains were designed to do, and to scale it up at organisational, national and international levels, perhaps the mistakes of the past could be prevented – and we could focus instead on preparing to save lives.

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### Images

Iceberg Image: [https://img.freepik.com/free-vector/iceberg-white-background-polygonal-illustration\\_68633-55.jpg?size=338&ext=jpg](https://img.freepik.com/free-vector/iceberg-white-background-polygonal-illustration_68633-55.jpg?size=338&ext=jpg)

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