

# AN INTEGRATED APPROACH TO LEARNING FROM PROJECT-RELATED FAILURES

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Project Based Organisations (PBOs) are established to optimise project delivery. Unfortunately, as failures still occur on projects, the anticipated performance enhancements of PBOs have not lived up to expectations to date. This has led to interest in how PBOs learn from project-related failures. Regrettably, despite considerable financial investment on projects, particularly infrastructure projects, there is limited research on learning from project failures. Hence, the aim of this study was to assess the practices and behaviours of project-based actors and organisations towards learning from project-related failures. To achieve that, semi-structured interviews were conducted with construction project management practitioners. Results reveal that systematic attempts to learn from project-related failures are rare. Barriers relate to the temporary and fragmented nature of projects, the negative perceptions around failure, and the fear of being blamed or punished for failure(s). Where such learning exists within PBOs, mechanisms such as project reports and project review meetings are typically used. The cause of project failures ranges from the actions of project actors themselves such as the project manager, designers, contractors and the client, to external events such as financing and technological challenges. The implication for project actors is that instead of relying on ad-hoc learning mechanisms, systemic and sector-wide approaches should be encouraged. This is by integrating the following six facets in the process of learning from failures: structure; culture; psychological; safety; policy; context, and; technology.

Keywords: project failure, PBOs, learning practices, organisational learning

## INTRODUCTION

Projects are now ubiquitous in society due to their perceived efficiencies in benefits delivery. This, and the increased use of programs and portfolios in organising activities is being referred to as the projectification and programification phenomenon (Midler, 1995; Maylor *et al.*, 2006; Thuesen and Geraldi, 2016). Unfortunately, projectification has not optimised benefits delivery because 'failures' still regularly occur on projects (Maylor *et al.*, 2006). To counter this, learning from project-related failures is being encouraged in most sectors. Yet, learning from failures in the construction sector is rarely practiced or researched. Consider how the NAO (2020) recently reported on three nuclear projects under the Ministry of Defence (MoD) which are seemingly failing and face an estimated delay of 5 to 6 years and 115% cost

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overruns. Understandably, the NAO (2020) has asked why the MoD has not yet learnt lessons from each of these three projects, or from other nuclear related projects outside the UK. Equally OConnor (2020), observed that the construction sector is failing to learn from past projects with 61% of its clients' programs not reviewing their procurement process in light of lessons from past projects. Perhaps this is a common failing in the construction sector, because learning from failures is easier said than done. This may be due to several barriers including a lack of a standard approach. Instead ad hoc approaches to learning are believed to be more common. Hence the aim of this study was to assess practices and behaviours towards learning from failures with the following objectives being set: (a) review existing PBOs' approaches around learning from project-related failures (b) assess the barriers in learning from failures and (c) suggest a framework for learning from failures that can be adopted by PBOs. Acknowledging the non-agreement on the definition of 'failure', as a guide the study considers project 'failures' as any unintended outcome on a project which could be small or large. These may include cost overruns, delays, poor quality and client dissatisfaction.

### **Barriers, Practices and Approaches towards Learning from Failures**

The regular occurrence of construction project 'failures' continues to generate interest in learning from them. The advantages in doing so are two-fold. First, there is the possibility of avoiding undesirable negative consequences, such as financial losses, environmental and physical damage, or injury/loss of life (Liu *et al.*, 2017). Furthermore, the assimilation of learning from past projects can enhance future performance, and mitigate against future failures (Cannon and Edmondson, 2005; Moore and Price, 2018). Regrettably, there is limited research on learning from failures, and where such studies have been done, they are rarely empirical (Liu *et al.*, 2017). The majority focus on organisational (rather than project-specific) learning and concerns of knowledge management. Such research includes Chan *et al.*, (2005) who looked at organisational learning challenges within a project, whereas Gameson *et al.*, (2008) focused on knowledge management through debriefing. Maqsood *et al.*, (2004) discussed techniques such as project reviews, project audits, after action reviews and post-project appraisals as means of collecting lessons on projects. Research that focuses on learning from failures within construction includes: the theoretical studies by Love *et al.*, (2011) who advocates for the adoption of a systematic approach; Baker *et al.*, (2018) who discusses attitudes and approaches of learning from failure, and; Velikova *et al.*, (2018) who developed a taxonomy of project failure as a way of enhancing learning from it. Use of Information Technology is also latterly being encouraged to assist in this, through automatic learning from construction injuries to using deep learning via artificial intelligence applications (Baker *et al.*, 2019b; 2019a). Barriers affecting learning from failures are identified as the temporary nature of projects, the involvement of a diverse range of professionals within teams, and the emphasis on constraints of the project time and cost targets. A lack of a standard definition of failure and approach to learning within projects and theoretical research have been cited as concerns (Chan *et al.*, 2005; Liu *et al.*, 2017). Cannon and Edmondson (2005) also observed a series of structural (organisational policies, procedures and complex systems) and social-related (senior management behaviour, negative perception and lack of owning failure) barriers. Others identify the poor management of emotions (Shepherd, 2003) and the chaos occurring during failures (Tainter and Taylor, 2014) as additional barriers. Such a

myriad range of challenges signify the need for a comprehensive, integrated approach to address them.

### **The Proposed Multifaceted Model of Learning from Project-related Failures.**

In order to review the learning approaches and behaviour, the study was theoretically informed by organisational learning. Several definitions of organisational learning exist. However, this study uses that provided by Lipshitz *et al.*, (2002, p. 82) who consider it as “a cyclical process involving the evaluation of past behaviour, the discovery of error or opportunity, the invention of new behaviours and their implementation”. Focusing on failures, one deficiency in the extant literature on learning from failure is a failure to address cultural and social factors, by relying on learning mechanism (Cannon and Edmondson, 2005; Carroll and Fahlbruch, 2011). Accordingly, Lipshitz *et al.*, (2002), subsequently supported by Chan *et al.*, (2005), identify five facets necessary for in-project learning. Rejecting a simpler 'two-fold' classification of structure and social systems (see Cannon and Edmondson, 2005), they instead argue that additional, contextual, psychological, cultural, and policy facets should also be considered. Hence, in order to obtain meaningful lessons from failures on projects, an integrated approach, which takes cognisance of the five facets instead of only relying on the learning mechanism, is proposed. This is by building upon the five-facet identified Lipshitz *et al.*, (2002). The five facets, and their relevance to learning from project failures, are as follows:

- A) Structural Facet - which addresses learning mechanisms, and the individuals involved in the detection and correction of the failure, and the organisational sub-systems involved in learning from failures. Mechanisms include post-action-, and project-, reviews.
- B) Cultural Facet - this provides the norms that are needed to create an environment fit for commitment to learning from failures, namely: transparency, integrity, inquiry and accountability. This encourages openness, and a sharing of information regardless of its implication, and assumes responsibility for the whole process of learning.
- C) Psychological Facet - this facet enhances psychological safety, whereby actors take risks that are necessary for learning and sharing information, and lessons from failure achieved by reducing threats while increasing trust.
- D) Policy Facet - this relates to the formal and informal measures put in place by management to encourage learning from failures through rules, budgets, procedures and policies. These are grouped into three: commitment to learning; tolerance for error, and; commitment to the workforce.
- E) Contextual Facet - this reviews the contextual nature of a failure such as its criticality, and its impact, i.e., the costs or losses suffered from a failure event manifesting. The feasibility of getting valid information on a failure is also considered.

Therefore, the rationale considered herein is that these five facets by Lipshitz *et al.*, (2002) create a more favourable environment for capturing and sharing lessons, unlike past studies that simply focus on failure identification, analysis, and learning mechanisms.

## **RESEARCH METHOD**

This exploratory study uses a purposive sampling method, with 7 carefully selected, appropriate construction professionals participating in semi-structured, mixed-mode interviews. In order to improve the quality of responses owing to the small sample size, consideration of the power of information was made by selecting participants with prior information on failure (See Malterud *et al.*, 2016). This was by drawing participants from diverse professions within the construction sector involved in management positions or higher with over 10 years of experience. The participants were also involved in building and infrastructure related projects such as commercial, education and health facilities. These included: 3 directors; 2 project planners; 1 electrical engineer/project manager, and; 1 civil engineer. Five of the interviews were face-to-face while two were telephone interviews in order to reach wide dispersed participants (Bryman, 2012). Due to the nature of the area of study, instead of the naturalised (verbatim) method of transcribing, a denaturalised method (focusing on accuracy instead of transcribing word for word including involuntary vocalisation such as sighs) was used (Oliver *et al.*, 2005). The average length of the interviews was 25 to 48 minutes. Thematic analysis supported by narration was used to analyse the findings which involved identifying the key themes arising from responses and relating them back to the guiding theory (Bryman, 2012). Questions were coded as main themes, whilst responses produced further sub-themes. The facets of organisational learning as proposed by Lipshitz *et al.*, (2002) were also considered as a basis for analysis, and for developing a subsequent framework.

## **FINDINGS**

The main themes from the findings were, as follows:

### **Causes of Project Failure**

In response to questions on the common causes of failures, participants variously advised of a lack of coordination, incorrect information, continuous technological changes, growing project complexities, and the too rushed process of establishing adequate project teams. Inadequate planning, employee turnover, lack of understanding project deliverables and financial problems were other causes variously identified the participants. From this, it was observed that participants tended to externalise the causes of failures. For instance, Participant 6 indicated that “When I took the job, the program was already in place... there was a lot of items missing on the program that wasn't detailed enough. We swallowed up 6 weeks of extra work”. This perhaps reveals reluctance to accept any ownership of failures: instead they are externalised by blaming predecessors or the wider supply chain.

### **Assessing Current Learning Practices and Behaviour**

When asked how organisational learning occurs, most participants cited a use of past project reviews and project 'lessons learnt' reviews involving key project team members. For example, Participant 6 stated that: “We have a lessons learnt meeting... with the director, the project manager, myself, the foreman, the QS team, the designers... got to come forward with our own [thoughts on] why we didn't hand over on time”. Participants 2 and 6 cited the use of intranet portals for uploading lessons from past projects. When asked who should participate in learning from failures, participants used terms such as “everyone” and “top to down[sic]”. Participant 6 supported engaging everyone as this offers every team member an opportunity to say what went wrong which is good for failure analysis. In contrast, Participant 4

favoured only key project members participating (the definition of 'key' being decided based on the nature and size of a project and the failure). Additionally, unlike most cases where PBOs themselves were the focus, Participant 7 included the client. Similarly, Participant 2 argued for the inclusion of project governance bodies (or, indeed, that government) as they also have to learn from failures. Amongst failure-types, similar to the findings by Baker *et al.*, (2018), health and safety related/types of failure were the most frequently referenced as being necessary for learning purposes. Per Participants 2 and 3, this was linked to health and safety management having systems in place for reporting and enforcing within organisations and the sector.

### **Lack of Cross-Organisational Willingness to Share Lessons from Failures.**

Interviews revealed little evidence of sharing failure lessons between organisations. Participation in such cross-organisational or external learning was restricted only to traditional government training programs. However, such learning hinges on the willingness to share failure-related information. Hence, when asked about willingness to share, Participant 5 submitted that it exists but is hindered by external pressures such as political influence, especially on projects funded by government or local authorities. In contrast, Participant 7 reasoned that willingness to share at a personal level is higher than at organisational level, and with bigger firms perceived as being less than willing. A similar unwillingness was observed by Participant 4 between departments within organisations. Such unwillingness to share, as noted by Participant 2, is influenced by the negative impact of failure on the image of an organisation (or a project or a department) while individuals fear any negative repercussions. This is because a common response to failure, as observed by Participants 4 and 5, is the blaming and dismissal of employees. Participants 4 and 6 also noted that 'willingness' is also influenced by individual behaviour, management style and the nature and severity of the failure, all of which can be linked to contextual and cultural facets.

### **Barriers to Learning from Failures**

In response to questions on the barriers to learning from project-related failure, participants variously cited: the lack of an agreed definition of failure; time pressure on projects, and; fast changing technology and teams involving different professions. Participant 7 highlighted the lack of time for adequate reflection and a lack of failures to learn from, which can be associated to unwillingness to share failure information. Others include employee turnover; challenge of new staff accessing information on past failures, and; the non-integration of project information in organisational learning (Participant 4). Participant 4 also observed that punishing and blaming employees, e.g., the PM, for failure(s) often leads to their departure thus depleting an organisations knowledge base. Linked to 'blame', a lack of ownership of failure remains a huge barrier because it is difficult to consider learning from failures without acknowledging them. This 'non-acceptance' issue was revealed by Participant 1 who stated: "its [failure] usually on site as opposed to the design concept ... its usually when you get to site and there is [a] coordination issue with different disciplines.... that's the bit where you tend to find there is a failure". Lack of ownership is also linked to the commercial nature of the industry as "any business open enough to talk about failure in a direct way risks the opportunity of working with that client" (Participant 2). Besides, Participant 5 noted that, low profit of the sector, lack of trust and wanting to just have things done does not afford the time and resources needed for investment in learning. Additionally, institutionalised behaviour or rigid beliefs (i.e.

of not accepting failures) as a barrier was also observed in some of the participants. This was when they externalised failure as being only site-related (Participant 1) or how their organisations (may) have not experienced failure due to having robust risk and PM systems (Participant 2). In both cases, no consideration for learning was apparent.

### **Enhancing Learning from Failures**

In response to a question on how to enhance the process of learning from failures, the need to create an environment with a culture of sharing failure information based on transparency within and across PBOs was highlighted. Participant 6 suggested being proactive and “shouting out” before the project fails. Accordingly, Participant 4 suggested that management and leadership should be open and engaging when handling failure. In addition, Participant 2 stressed the need to allow “room for failing”. Participant 7 also submitted that the industry needs to accept that certain lessons can only come from failures, and from people acknowledging failures. Taking advantage of technological advancement and its opportunities for learning from failures was also identified. For example, Participant 2 suggested use of a portal for submitting project reviews with the possibility of machine-learning and artificial intelligence. Fundamentally, since project-related failures are subjective, instead of taking a universal approach to failure, each organisation should pay attention to the key stakeholders' needs on each project and its overall delivery process (Participant 2 and 4). Participant 1 also stressed the need for inter-discipline learning because it is “dangerous to concentrate just on your expertise”. Thus, with reference to Bakker *et al.*, (2011) the unique, inter-disciplinary and transient nature of projects can be considered as hubs for knowledge creation and learning instead of being barriers. Essentially this calls for a change in culture as echoed by the participants. For instance, Participant 2 submitted that the need to change culture by moving away from a notion of: “we produce deliverables, towards we produce a landscape of information that everyone uses”. Hence, instead of focusing on project outputs and on completing the 'job' alone, consideration should also be given to capturing lessons and allowing for meaningful reflection during project delivery. On that basis the study argues for a systemic and integrative approach as discussed in the following section.

### **Framework for Learning from Failures and Discussion**

Considering Lipshitz *et al.*, (2002) five facets of organisational learning, though measures for enhancing learning from project failures were provided, current practices are ad hoc and isolated with a focus on Structure (learning mechanisms). Evidently, little or no attention is given to the other facets such as: Policy (rules encouraging learning); Culture (support given to allowable failures), and; the Psychological (how safe employees feel to experiment). Consequently, such ad hoc means do not address the social related barriers such as the negative perception of failure, blaming and non-acceptance of failure. To counter that, the study favours an integrative and systemic framework by building upon the works of Lipshitz *et al.*, (2002). Such integration is viewed from two perspectives: the level of analysis (or learning) itself, as from either the organisation, project or individual actors (see Goodman *et al.*, 2011), and; the learning facets/disciplines advocated by Lipshitz *et al.*, (2002). This is in line with Participant 3 who recommended that organisations need to encourage the acceptance of failures among their employees through various possible ways such as organisational culture and policies. Therefore, aligning with Davis and Marquis (2005) and the participants perspective of involving everyone, integration has to be

both at the level of analysis (or learning) and the facets instead of a simplistic approach focusing on one facet. However, from the data analysed, one limitation associated with model by Lipshitz *et al.*, (2002) is that it does not explicitly consider technology which was recommended by Participants 2, 3 and 6. Accordingly, in developing the framework, besides the 5 facets by Lipshitz *et al.*, (2002), the technological facet is included for capturing and sharing failure related information as shown in Figure 1.

	Individual Level			
Sectoral level	Structural	Cultural	Policy	Project level
	Psychological	Contextual	Technological	
Organisational level				

Figure 1: Integrated Framework for Learning from Failure (Adapted from Lipshitz *et al.*, 2002)

From the interview data analysed, though some facets in Figure 1 were highlighted, they were presented or applied singly, and the majority remain unaddressed or lacking in practice. For instance, focusing on the Cultural and Psychological facets, Participant 2 indicates that employees are scared to speak when something goes wrong fearing both being punished, and the negative commercial impact on their business. The Policy facet is equally lacking in practice as only two participants indicated that they have deliberate measures in place for capturing lessons. Participant 4 also indicated that mostly they rely on individual initiative with Participant 1 admitting that “We don't really have anything internally; we don't really do things for that stuff [learning from failure]”. The Contextual facet also received little consideration even though Participant 4 suggests that the nature of failure should dictate who participates in the learning and the willingness to share failure information. Additionally, though organisations argue that it is not possible to learn from other projects and PBOs due to aspects of uniqueness, Participants 5 and 6 indicate that common failures are encountered on similar projects. Hence, based on Figure 1, the Structure facet should encourage cross-organisational learning as advocated by Stead and Smallman (1999). Thus, the four levels of leaning in Figure 1 also serve as sources of failure lessons. This is in order to avoid the myopia of internal (organisational level) learning as discussed by Chan *et al.*, (2005). Similarly, Sydow *et al.*, (2004) advocated for sector wide 'Competence Networks' as a means of learning across organisations or projects.

Therefore, Figure 1 reveals that for PBOs to learn from failures, in addition to the learning mechanisms they should have: A culture committed to learning from failures; policies to support this; participants enabled and encouraged to take meaningful risks; contextualised failures, and; they should take a sector wide perspective. Thus, instead of relying on learning mechanisms solely (structural facet), the study calls for the integration of the six facets in order to mitigate a myriad of barriers associated with learning from failures which in most cases are associated with the cultural and behaviour factors (Cannon and Edmondson 2005; Love and Curtin, 2019).

## CONCLUSION

When examined through a lens of organisational learning, and based on the work of Lipshitz *et al.*, (2002) the construction industry, if it engages at all in learning from project failures, relies mainly on the structural' facet. However, failures in projects are complex with varied causes, and there are barriers to capturing lessons from them. Simply relying solely on mechanisms such as post-project and post-action reviews alone will not permit meaningful learning to take place. Besides that, project

environments have seen an increased use of networks and alliances (Davis and Marquis, 2005; Maylor *et al.*, 2006). Therefore, it is imperative that the sector considers cross-organisational learning with practitioners taking a wider view and embracing the idea of a community of learning amongst PBOs supported by all six facets, instead of focusing on only project outputs and relying on ad-hoc learning mechanisms. One immediate limitation of the study recognised is that, owing to the current small sample size, the findings herein cannot be generalised. It is therefore recommended that similar future studies consider these issues, testing them against a bigger sample size.

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