CHALLENGES AND OPPORTUNITIES OF LEARNING FROM FAILURE: LOOKING BACKWARDS TO MOVE FORWARD USING VIGNETTES

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Data collection on topics such as failure may be challenging due to their sensitive nature. Hence, as a way of 'looking backwards in order to move forward', this study adopted self-administered vignettes to review the topic of learning from failures by construction professionals. Findings reveal that efforts to learn from failures across the sector are hampered by the fragmented nature of the industry and divergent perception and values held by projects parties. To enhance learning from failure, the sector is encouraged to ensure that project parties have a common goal and are supported by openness and transparency. In addition, technological tools are to be considered for both capturing and sharing lessons from failure realising the complex and sensitive nature of failure. Implication for the academia and industry are that to understand failure, non-obtrusive research approaches are encouraged such as vignettes.

Keywords: learning from failure; challenges; vignettes; failure

INTRODUCTION

Reflecting on the past 40 years, the field of construction project management has made notable improvements. This is evident from several project management methodologies that have been introduced such as lean construction, agile. In addition, digital tools such as building information modelling (BIM) and artificial intelligence (AI) have been introduced to achieve project goals such as sustainability, cost control, and risk management. The introduction of such tools has not saved the industry from experiencing project-related failures such as poor quality, structural failures, persistent reworks, time and cost overruns (Love *et al.,* 2018).

Therefore, the sector is being encouraged to learn from past failures to improve project delivery. Realising that sharing lessons from failure is hindered by the sensitive nature of failure and fear of negative publicity, the study adopted vignettes which are non-obtrusive. Hence, the main objective of this is study is to encourage learning from failure by adopting non-obtrusive data collection methods. The study also responds to limited discussion and reviewing of methodological approaches used

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in construction management (Pink *et al.,* 2010) and failure-related research with majority being anecdotal. According to Loo (2002) vignettes are short text narratives on a particular matter used to stimulate responses and insights from participants. They include hypothetical persons, situations and other fictious material constructed in order to elicit responses on sensitive areas of study (Gledson and Downs, 2017). They vary in number, length, and complexity depending on the nature of the study (Poulou, 2003).

With ethnographic related studies being encouraged (Pink *et al.,* 2010; Sage *et al.,* 2014), and yet failure presents a challenge of capturing such due to its negative impact. Therefore, vignettes serve as a research tool adaptable to various research approaches. This aligns with Hughes and Huby (2002, 2013) who note that vignettes may also take the form of video recordings which offer a solid basis for simulating elements of real life and are regarded to be more meaningful, faster for prompting and unbiased. This may also involve video-taping the participants to capture their responses. However, written text type of vignettes was used in this study since they are faster and offer privacy to the participants instead of being filmed.

Use of Vignettes in Failure Related Research

Due to the distance and safety created between the topic and respondents, vignettes are favoured in sensitive and behavioural studies which seek to assess intentions, attitudes and emotions (Poulou, 2003; Gledson and Downs, 2017). Poulou (2003, 52) adds that vignettes "enable the researcher to exercise greater control over his/her variables and therefor increase the internal validity of the study". They are also used across several domains, for a range of purposes such as education (Poulou, 2003) to ethical dilemmas within project management (Loo, 2002). Yet, their use in construction-related research remains low compared to other sectors (Gledson and Downs, 2017). Particularly, they are rarely applied in failure-related studies in the construction sector unlike other sectors such as health studies who frequently seek to learn and apply lessons from failure (Bauer and Mulder, 2007).

Evidently, the research methods within construction and failure related as observed by scholars most take a positivist (quantitative) approach with data collected via a questionnaire (Saunders *et al.,* 2014, Chiponde *et al.,* 2023). For instance, Rabowiak *et al.,* (1999) and Carmeli (2007), earlier discussed error orientation and psychological safety respectively using a questionnaire with more recent studies such as Amini *et al.,* (2023) adopting the same. Qualitative studies use semi-structured interviews such as Chiponde *et al. (*2020) and Hagebakken *et al.,* (2024) with limited use of vignettes. Yet, vignettes are diverse and can be open ended (qualitative) or closes ended (quantitative) such as Likert scale (Gledson and Downs, 2017). Vignettes are also suited in both longitudinal and cross-sectional data collection approaches (Hughes and Huby, 2013). Therefore, the study adopted vignettes based on the following reasons. Firstly, Hughes and Huby (2002, 2013) note that vignettes use non-directive elements which enable respondents to form unbiased interpretations and responses.

Secondly, vignettes are un-obtrusive as they are impersonal and 'detached' from the participants. Therefore, they are useful for sensitive studies such as failure-related by offering safety and privacy to the participants (Poulou, 2003). Vignettes allow respondents to provide responses without devaluing their own personal self-image(s) and avoid any negativity associated with personal failures. Since vignettes use narratives, they are better understood and enable collecting standardised and uniform feedback by acting as a framework for data analysis (Hughes and Huby, 2002). They

also trigger imagination, problematisation and interest when compared to 'yes' and 'no' responses (Poulou, 2003). They are also economical, easier and faster to administer (Hughes and Huby, 2002). However, vignettes are limited since they focus on one, or very few aspects of a problem. Narratives or hypothetical vignettes do not provide sufficient information on the real world they attempt to simulate (Hughes and Huby, 2002, 2013). Therefore, responses obtained using vignettes may not truly reflect the intentions or behaviours participants would do in real life. Thus, findings from vignettes are not generalisable (Poulou, 2003). Nonetheless, realising the sensitive nature of failure and viewed negatively, vignettes were adopted since they are non-obtrusive which does not damage participants' image or safety.

Learning from Failure and Related Challenges

Sectors such as aviation and health are known to have improved their operations by learning from failures (Bauer and Mulder, 2007). In particular, the health-related studies encourage developing psychological safety among professionals so that they can share the failures openly and without fear (Edmondson, 1999). Equally, the construction industry is being encouraged to learn from such occurrences, essentially looking backwards to move forward. This has seen studies encouraging the use of digital tools such as machine learning and artificial intelligence (Baker *et al.,* 2020). Other studies have argued for a multifaceted approached which covers factors such as structural, cultural, technological, policy, context, psychological safety, governance (Lipshitz *et al.,* 2002; Chiponde *et al.,* 2020; Chiponde, 2023). Ming (2018) also suggests vicarious learning via observation and networking.

Recently, Chiponde (2023) echoed for an institutional approach that does not only focus on the project-based organisation but also key actors within the sector such as professional bodies, regulatory bodies, and suppliers when learning from failure. Even with such encouragement, the industry mostly relies on lessons learnt meetings and project reports which according to Sage *et al.,* (2010) are rarely referenced after project completion. This is because, learning from failures is hampered by several factors which Cannon and Edmondson (2005) categorised into two groups, (a) technological factors which include project poor planning, time constraints; and (b) the social-economic factors (fear of failure, blame culture, and the negative impact of failure) with those sharing their failures risking their competitiveness.

Temporal teams, competition and the fragmented nature of the sector have also been cited as barriers. Other barriers include varying needs amongst project parties such as profitability and a good reputation for the contractor whilst the client is focused on cost saving (Chiponde *et al.,* 2020; Chiponde, 2023). From a research point of view, the positivist approach based on quantitative methods is mostly adopted which do not allow for an in-depth review and understanding of project-related failures even when it is known that failure is contextual and subjective (Sage *et al.,* 2014). Equally, majority of studies focus on 'the learning mechanisms' without discussing or exploring other ways of collecting data on failure. Hence, this study adopted vignettes as a way of collecting data on failure. Note that the study does not recommend the solely adoption of vignettes but echoes for their (vignettes) versatility and compatibility with other research methods such as interviews and case studies. With questions being either open ended or closed ended, this also presents researchers with the opportunity of adopting a mixed research method.

Organisational and Management Research

Romme (2003) earlier observed that research in organisations is primarily pluralistic in nature by involving both natural and social sciences. Similarly, Koskela (2017) reasons that both technical and social aspects should be considered if production in both project and construction management processes are to improve. Equally, Pink *et al.,* (2010) have also called for ethnographic related research approaches with construction for more a better understanding of the industry's problems and context. This remains key for learning from failure realising the social and moral impact failures has on individuals. Accordingly, Holzmann (2013) recommends that knowledge and information research should endeavour to understand how social aspects influence the processes and tools for knowledge transfer on a project. This assumes the social-constructivist nature of knowledge by trying to understand and explain the human experience and influence on organisational practices (Karataş-Özkan and Murphy, 2010). This also aligns with Sage *et al.,* (2014) who echo dynamic approaches in reviewing failure. Thus, from a social context of learning from failure, it is worth realising how the sensitive nature of failure impacts on collecting failure related data. Hence, the study proposes the use of vignettes which are non-obtrusive.

METHOD

Due to the limitations of time and the nature of the subject matter, the study adopted open ended questions to gain an in-depth understanding of the subject of learning from failure. Open ended approaches are recommended in vignettes in the study of failure since closed ended responses may not capture socially embedded factors. This aligns with Bryman (2016) who reason that qualitative methods give in-depth and meaningful interpretation of the phenomenon being studied. Therefore, the study adopted an exploratory approach with an interpretive philosophical stance being taken which is deemed valuable for problem identification, conceptualisation, articulation and establishing ‘meaning’ or understanding a phenomenon (Aken, 2004). This was achieved by using vignettes as the method of collecting data.

Construction of Vignettes

To avoid ambiguity and at the same stimulate insightful responses on learning from failure, the designed vignettes were short, simple and as realistic as possible to the phenomenon of failure (Poulou, 2003). Generic roles involved in project delivery and known to every participant such as the 'project manager', 'quantity surveyor' and ‘contractors’ were used. The vignettes were informed by extant literature; vetted by experts; and piloted to remove ambiguities (Hughes and Huby, 2013). Considering limited time for audio and since participants in the study were fully conversant with text-based approaches, text vignettes were used. These were self-administered to provide privacy, adequate time and conveniency to participants. The narratives were also ‘depersonalised’, to create distance between the participant and the study of failure (Hughes and Huby, 2002, 2013; Gledson and Downs, 2017).

An example of a vignette developed for this study is given as follows: “Having noticed an increased trend of failures on government funded projects and the construction sector at large, a taskforce has been constituted to see how such experiences can be harnessed as lessons for improving the delivery of future projects. Members of the task force were drawn from three main groups in the sector: Professional bodies; Contractors and suppliers, and Government departments involved

in delivering infrastructure." The following open-ended questions were asked: (1) What roles would you consider each of the categories will play in the process? (2) What are some of the limitations or challenges that can be associated to each of the group in learning from project failures? (3) Which group would you consider having more influence in enhancing learning from failures and why? (4) Which other category would you consider adding to the three suggested categories and why? In total, 5 responses were obtained. The low rate also gives insights into the limitation of using vignettes.

FINDINGS AND DISCUSSION

To understand and encourage 'looking backward to move forward' by learning from failures, the findings from the vignettes are divided in the following: (a) the impact of failure and barriers associated with learning from failure (b) Current practices being applied (c) How to improve the process and (d) the key parties to be involved in learning from failure.

Impact of Failure and Unexpected Events e.g., Covid

In response to a vignette on the experience of an unexpected event, such as the COVID-19 pandemic, participants cited several impacts on the organisation with insolvency being one of them. Participant 3 further added that "Remedying defects is hugely expensive". Interestingly, besides the negative impact of failures and related events, Participant 3 noted that such events do not always act as barriers but also an opportunity to bond: "Loss of site supervision and loss of site labour due to isolation hasn't been as big a factor as I expected... Initially it was shortage of materials due to factory closures. But as the pandemic has continued Statutory supplies (gas water electricity) have increasingly been a problem.

There are positives, remote working being properly available and encouraged by employers. In our experience, much closer relationship with our clients/employers 'we're in it together' attitude". Participant 2 also noted that Covid 19- has also influenced how businesses are structured and operate "Working from home, new normal, social distancing, working guides, listening to feedback, investing in online tools to stay connected, training and tutorials on new tools, mental health support". Thus, unexpected events or failures, offer an opportunity to identify and form supportive relationships with a possibility of sharing lessons. However, such opportunities are hampered by several factors cited by participants such as fragmented parties, different values among stakeholders. Participant 3 indicated that "This is fundamental problem with construction. Three disparate bodies with opposing agendas for a project. There needs to be a common goal for the project that respects each bodies agenda. I'm a contractor, my aim is to make a reasonable profit. Yet in government projects, particularly framework projects the contractor is actively encouraged to not make a profit". Hence, establishing a common goal among project parties cannot be over emphasized.

Current Practices on Learning from Failure

Lessons learnt meetings and reports remain the common means of learning from failure. This was observed from Participant 1 "Lessons learnt means documenting the specific problems a project had, and looking at what needs to be looked at in the future. This usually takes the form of a short report looking at different aspects and metrics of the project". This highlights how even with many years of encouraging learning from failure, systems or practices are not well established within

organisations. "It's quite an involved process, not fully implemented but being developed. Another solution is analysing project reports to find trends. Currently done manually" (Participant 1). Wash-up meetings were cited too whose objectives are rarely achieved as noted by Participant 3 "…framework has wash up meetings. I'm not convinced that the lessons are truly learnt though. As a business we have completion reviews, which meant to be a no holds barred discussion, but they rarely are" Participant 3. Typically, such learning or looking backwards mostly takes place at the end of a project based on the participants. However, Participant 5 suggested considering every stage of a project "Identify the main causes and trades involved and increased site checking at every stage of the project".

Improving and Encouraging Learning from Failure

According to Participant 4, proper documentation of failure-related information is key. Participant 1 also stated that "I would analyse the meeting and document key findings. These key findings would be discussed internally, and an action plan created. The findings and future actions would be disseminated, along with information about any organisational or process change". In addition, Participant 1 encouraged "Whole company briefing not just managers". Generally, everyone must be involved, not only senior managers as echoed by Participant 1 "you normally introduce everyone, ensure everyone is familiarised with why they're here and what our objectives are. Then you open the floor for comments and encourage contributions, further encouraging others to comment…. Creating a relaxed atmosphere and encouraging contribution hopefully means that people share their concerns and knowledge".

The major themes arising from the participants are: The first theme is 'openness' "again openness and confidentiality is needed to draw out the true story, not a sugar-coated marketing one" (Participant 2). Participant 3 also indicated that "Honest, unbiased, open minded, healthy discussion". The second theme is incentives to help with identification and reduction of defects supported by Participant 2 who noticed a reduction in errors and improved identification of defects: "Reviewed the defects list, challenged the team and supply chain as to why it occurred. developed a strategy with this information to ensure its not repeated… Introduced an incentive scheme for defects [identification]". The third theme was engaging third parties to avoid biasness "I would probably use a facilitator with no knowledge of the project to jaundice the review". To support the process, digital tools are also encouraged "An online library of lessons learned - categorised for future teams to research a past project" (Participant 3). The fourth theme is reviewing contractual provisions as indicated by Participant 2 "Robust contractual wording to protect all parties". Participant 4 also recommended "An auditing process for the risk management and mitigation plan".

Roles of Key Parties and Who Else to Consider

Answering the question of who should be involved or may have influence the process of learning from failures, essentially 'looking backward', participants argue against the typical construction team solely learning from failure. Instead, end users and the public are being encouraged. In addition, "All groups must be overt about their agenda and others acknowledge and respect it" (Participant 3). This is supported by Participant 2 who suggested "Public consultation groups - Openness Treasure - to monitor expenditure and drive efficiency saving". Taking an organisation level, Participant 4 suggested that "Inside an organisation of the contracting company I believe the technical office, quality control and contracts departments are the highest influencing department". However, majority of the responsibility is placed upon the

contractors and the supply chain who are mostly involved in lessons learnt meetings and post project reviews. In contrast, Participant 3 submitted that "I think… all [contractor, professional bodies, client] have equal influence". Clearly, learning from failure, including 'looking backward to move forward', is not a role by one person and needs the involvement of all key parties at various stages of a project as noted by Participant 5 "We carry out checks at every stage of the project with regular inspections and contact with trades, subcontractors, and client groups".

Reflecting on how vignettes influenced the data collection process and revealing nuances on learning from failure, it is worth noting the low response rate due to the nature of questions on vignettes which are longer compared to closed-ended questions with a 'yes' or 'no' type of answer. However, even with such limitations, participants responses to vignettes reveal two different perceptions of failure (a) being a negative, (b) with others regarding failure as an opportunity to bond. This is based on responses to vignettes on unexpected events such as the COVID-19 pandemic which revealed a resilient and supportive attitude referred to as a 'we are in it together attitude' by Participant 3.

However, the common reference to 'profit', 'shortage of materials' and 'delays' echo a rational normative (positivist perception) of failure which is focused on the iron triangle (cost, time, and quality). Thus, this study echoes call for a more critical perception of failure which embraces socio-political aspects instead of the managerial/functional (positivist) approaches (Sage *et al.,* 2013). In response to failure and learning from such experiences, the vignettes also reveal a reactive approach (mostly at project completion) instead of a proactive approach since systems are not fully developed within organisations (relying on lessons learnt meetings). With responses to vignettes recommending 'a relaxed environment' and 'offering incentives' for effective learning from, highlights how actors are demotivated and not free to share lessons from failure. Thus, responses from the vignettes further echo the need to develop psychological safety (actors to state freely situations as they are) among project actors for the sector to move forward by looking backwards.

DISCUSSION

For an industry that is highly competitive with firms thriving on a good reputation, research and the bid of looking backwards to move forward requires using different methods besides the typical questionnaire or interviews. The implications for project parties are that to effectively look backwards and get meaningful lessons from failure calls for creating a conducive environment and blameless culture. This also aligns with Edmondson (2019) who encourages developing psychological safety among team members to discuss failures freely. In addition, parties are encouraged to consider using research methods which limit the damage failure has on participants, such as vignettes which create a distance between the topic and the respondents. Accordingly, responses from the vignettes have provided insights of how over the years, learning from failure on projects takes the form of reports and lessons learnt minutes.

Yet scholars such as Sage *et al. (*2010) contend that such reports are rarely used and do not cross project and organisational boundaries. Beyond such reports, findings highlight the need to review contractual clauses to encourage learning from failure. Additionally, the advancement in technology should be considered for capturing and sharing lessons from failure. Parties involved in learning from failure should include other project stakeholders (e.g., client, regulatory bodies, public, end users) instead of

focusing on project team members. Besides that, transparency, confidentiality, and openness remain important. As a limitation, it is worth acknowledging that no single research method can sufficiently create a full image or reality (especially that the responses were low). Hence the study does not recommend the use of vignettes solely but suggests that such methods can be used with other methods (interviews, focus group) to collect data on sensitive studies such as failure. Accordingly, Hughes and Huby (2013, 46) observed that "Rarely are vignettes used as a means to simulate complete reality.

Rather vignettes are used to simulate partly elements of the topics under study". Hence, these findings should stir discussion and research around project failure. Thus, areas for future studies may include addressing how project parties such as the client and professional bodies could encourage learning from failure and means of incentivising those learning from failure. The study also suggests further research using vignettes alongside other methods such as surveys and interviews.

CONCLUSIONS

Looking backward to move forwards is an opportunity for the sector to build better. However, considering topics such as failure, the sector is presented with challenge of collecting sensitive data. Importantly, for effecting learning from failure, creating an environment that encourages open discussion of failure remains essential. Taking a holistic approach that does not only place a responsibility on the contractor but engage other parties such as the client and end users to have a wider view of improving the delivery of projects is encouraged.

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