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EDUCATION: A CHANGE AGENT FOR PROJECT FAILURE?

ANN STEWART[1], AYMAN NASSIF[2], and ANDREW STEWART OBE[1]

[1]*Faculty of Business and Law, University of Portsmouth, Portsmouth, UK*
[2]*School of Civil Engineering & Construction, University of Portsmouth, Portsmouth, UK*

This research paper seeks to critically assess the role of education in addressing the skills gap in managerial competences and resilience to project failure within the project management profession. In order to achieve this it will address issues relating to why projects fail. To conduct this research an unobtrusive approach is undertaken through the use of content analysis. Content analysis is used to examine the qualitative data drawn from 4 case studies on project failure. It will use a thematic approach and coding to identify emergent patterns and trends. This in turn will help to capture and identify lessons learnt that could be adopted to create a new model of educational and leadership competences for project managers. By encouraging more critical reflection in training and educational development programs, it is proposed that this will empower project managers towards a better understanding of their corporate social responsibility within their profession. This paper concludes that failure to properly educate project managers has serious implications on their professional identity and credibility as practitioners, as well as for future pedagogical practice.

Keywords: Training, Lessons learnt, Resilience, Reflective practice, Competences.

1 INTRODUCTION

A search of the literature in a quest to establish the reason for project failure gives no single answer. The reasons for project failure are diverse, ranging from the use of fixed price contracts as a single point of failure (Jørgensen *et al.* 2017), changes within the execution stage which can adversely affect project performance (Chen 2015), failure to address stakeholder complexity in large cultural building projects (Mok *et al.* 2017), or blamed on deficient management (Sage *et al.* 2014) to name but a few. As projects are unique and have a degree of complexity within the environment in which they operate (Bakhshi *et al.* 2016), this opens up the ongoing debate of what then is project success and what is project failure? Are these terms mutually exclusive? To answer these questions Alami (2016) suggests that project success is based on parameters. If the parameters are accomplished then the project can be considered as successful. However, failure to meet objectives within the defined parameters could ultimately lead to an unsuccessful project outcome and project failure. As far as Alami (2016) is concerned project success is about survival and how to manage change whilst trying to keep the "eco-system" balanced. Thus the outcome of a project will largely depend on the complexity of a project's "ecosystem" within which it operates.

In view of the recent project failure in Miami, USA, in March 2018, where a pedestrian bridge under construction commissioned by Florida International University collapsed killing 6 people and injuring at least 9 others, this research aims to critically assess the role of education as

a moral change agent to improve professional practice, in seeking to address the ongoing debate within the discipline of project management as to why projects fail. It is therefore hypothesized that there is a need for project management professionals to continuously reflect and critique their own practice, so that they would be better trained and equipped to deal with challenging circumstances that affect their professionalism, credibility and the safety of others. There are two research objectives. The first being to carry out an in-depth analysis of four different construction projects that hit the media within the past 5 decades over criticisms of project failure, in order to identify emergent patterns and trends. The second objective is to capture and identify lessons learnt from the case studies that could be adopted to create a new model of educational and leadership competencies for project managers.

2 RESEARCH METHODOLOGY

This research explores four case studies within the construction sector that are well known, as shown in Table 1. The reason for their selection is due to the fact that they have attracted widespread media attention as failed projects.

Table 1. Overview of case studies.

Case Study	What happened?
Grenfell Tower Block (London, UK) 14 June 2017	Fire broke out in a 4th floor flat of a 24 storey building and spread rapidly. It set the exterior cladding alight, which turned out to be flammable material with no clear evidence of pre-testing. 72 lives were lost, possibly more in the carnage. The cost of refurbishment in 2016 was £8.6 M
Florida Bridge (USA) 15 March 2018	The bridge collapsed while being assembled across a busy highway killing 6 people. Two days before the catastrophe a crack was detected by an engineer who reported it as not a safety concern to the Department of Transport. The message was picked up on the day of the disaster when a meeting was convened less than 5 hours before the bridge collapsed. Cost of the bridge USD 9.4 M with USD 2.4 M over budget.
Kutai Kartanegara bridge (Indonesia) 27 Nov 2011	The bridge collapsed while undergoing maintenance work killing 12 people and injuring dozens more. Poor quality of material was detected as well and criticisms were addressed against the working methods of the maintenance contractors. The cost of the bridge was USD 7.4 M.
West Gate Bridge (Melbourne, Australia) 14 Oct 1970	Whilst undergoing construction, the bridge collapsed on 14 October 1970. Thirty five construction workers lost their lives as they were trying to resolve a technical issue over a 4" camber through what was criticized as poor judgement and serious miscalculations. At the time of construction, the cost of the bridge was AUD 202 M.

The impact and cause of the failure will be assessed against 10 factors, for example, cultural, ethical, technological and legal; and 10 behaviours which includes driven to deliver, courage to challenge and accountability. These factors were carefully selected for the purpose of the research to give deeper insight and richer data sets for the case studies. An unobtrusive approach was used for this research using content analysis. Content analysis is used to examine the qualitative data from the case studies using a thematic approach and coding to enable the researchers to make inferences and draw meaningful conclusions (Graneheim *et al.* 2017). Inferential coding was selected. This method was chosen as a research technique to enable observations of content to be captured and codified using a coding sheet containing up to 10 sub categories of analysis in order to provide more in-depth, critical and objective data for analysis. Before the coding took place it was necessary to undertake a wide review of the case studies by consulting as many sources as possible ranging from the social media, professional Institutes, practitioner and government websites, books and journal articles, in order to gain an holistic and

more objective understanding of what took place, to reduce research bias. Table 1 provides a brief synopsis of the four case studies used in this research.

Having compiled Table 1 the next step was to review the case studies and source materials again and this time with 3 coders (authors) to systematically examine the factors that could have contributed to the project failure in each individual case study. Each factor was ranked using a scale of 0 to 10 where 0 represents no evidence available to suggest there was an issue, 1 suggests very little evidence, 5 represents a reasonable amount of evidence exists through to a score of 10 which indicates a very high amount of evidence exists. Three coders were chosen to ensure more validity and reliability of the data and to reduce subjectivity through individual bias. To help with the coding, definitions of each factor were established, to increase reliability and to help achieve a common frame of reference (Graneheim *et. al* 2017). This then took the coding to a different level which was more evaluative. Adopting an evaluative approach to coding helps to assess the quality of the content and then make a judgement. This judgement is then recorded using an ordinal rating which can help to capture behaviours. The coders then compared individual rankings and agreed the overall scores which are presented in Table 2 below. The two categories examined are "cause of project failure" and "impact of project failure." The maximum score for each sub category is a total of 40 points.

Table 2. Ranking of causes and impacts of failure, content analysis.

Criterion	Ranking of cause of failure					Ranking of impact of failure				
	CS1	CS2	CS3	CS4	Total	CS1	CS2	CS3	CS4	Total
1. Political	4	3	1	2	10	9	7	6	7	29
2. Legal	9	8	4	7	28	9	9	8	8	34
3. Economic (Financial)	10	4	6	2	22	9	7	8	7	31
4. Societal	6	4	3	2	15	9	9	7	8	33
5. Cultural	7	5	6	6	24	8	5	5	7	25
6. Environmental	4	4	4	1	13	4	6	6	4	20
7. Technological	9	9	8	8	34	9	9	6	8	32
8. Ethical (corruption)	8	3	8	2	21	8	2	6	3	19
9. Educational/Training	7	9	9	8	33	8	8	8	8	32
10. Lessons identified	10	8	7	8	33	9	9	9	8	35

3 RESEARCH FINDINGS

This section of the paper will discuss the overall results presented in Table 2 to identify the key factors that caused the projects to fail and to critically assess their impact.

Figure 1 illustrates that the three most significant sub categories, when combining the causes and impact of project failure are technological, educational/training and lessons identified. The least significant are environmental and ethical. The significant variances between causes and impact of failure are in the subcategories of political and societal. Taken individually, the highest impact of failure are lessons identified and legal issues. In contrast the highest causes of failure were technological, education/training and lessons identified. A discussion on the significant subcategories findings will now be evaluated.

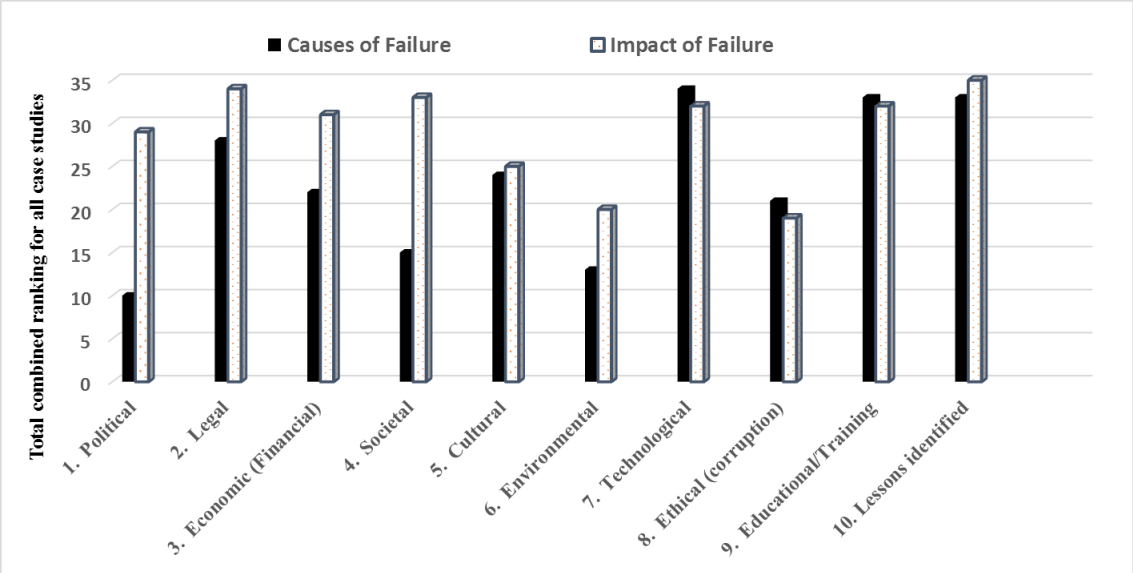

Figure 1. Comparison between causes and impacts of project failures.

3.1 Technical Issues

The technological issues revealed in the case study analysis were due to the following observations, failure to test building equipment and materials and implement an overall strategy for fire safety evacuation (e.g. Grenfell, cladding); overcomplicated concrete mix (Florida Bridge); poor quality material which adversely affected the structure and lack of understanding and knowledge of the structure (Indonesian Bridge, nuts and bolts), poor judgement and serious miscalculations (West Gate Bridge). These issues identified were all preventable and highlights the need for more critical reflection to learn from failure (Mann 2008).

3.2 Political and Legal Issues

Politically there was a lack of leadership in decision-making by the government over the banning of combustible materials which meant there was little respect for compliance from industry (e.g. the Grenfell, cladding). Legal aspects include breach of fire safety regulations with direct criticisms addressed to the fire service for failure to implement PLAN B evacuation policy (Grenfell) and compliance with health and safety legislation (in all four case studies). All the case studies involve manslaughter offences either individually or corporately and highlights the need for tighter regulation (Bridle and Sims 2009) and governance.

3.3 Economic (Financial Issues)

Evidence suggests that there are several compromises in the case studies to reduce costs either in the short term or long-term as in the Florida Bridge example of self-cleaning concrete whilst this was an innovative concept it was largely untested. Other examples include cheaper products being used in both the cladding (Grenfell) and cheaper material such as the bolts and nuts and lack of regular inspection checks (Indonesia Bridge). This suggests financial compromises have been made but it does not take into account the economic loss when things go wrong (Wong *et al.* 2005).

3.4 Societal and Environmental Issues

There is an emergent trend that society trusts the "Brand name "of the recognised Designers and Construction companies. This is validated from the case studies. Therefore nobody questioned the Designers competence and thus blindly accepted their work without question even when flaws were detected as in the cases of the West Gate and Florida bridge designs. This then challenges the behaviour and thinking of society as a whole and suggests that the failure can be attributed to societal failure (Brady 2014, 2015, 2016).

3.5 Cultural and Ethical Issues

Industry wide there appears to be a general acceptance of non-compliance with regulations, codes and safety standards especially where they were not evident (Grenfell, Indonesia Bridge, West Gate and Florida Bridge). When faults were suspected there was a general lack of interest to follow up with concerns (Grenfell, West Fate and Indonesia Bridge) or where this was evident (Florida Bridge) it was not diligently pursued. This shows a lack of corporate social responsibility and accountability (Mok *et al.* 2017, Victoria 1971).

3.6 Educational and Training Issues

There was a lack of training for complex fire scenarios and guidance for the Public on the "stay put" policy (Grenfell). There was also a paucity of training on the importance of adherence to regulations, codes and standards as evident in all 4 case studies. There needs to be more education in the importance of mutual interdisciplinary respect between the technical stakeholders, e.g. Designers, Engineers, Construction specialists, Consultants and regulatory bodies. Education of project managers must include these aspects and competences to understand and interpret complex structures and their performance through rigorous testing methods before materials are approved as safe for construction projects (Terwel *et al.* 2014, Collings 2008).

4 CONCLUSIONS

In response to the research aims and objectives this paper has identified that there is no single factor that can be taken in isolation for project failure. Although there are lessons to be learned from each case study, history repeats itself and therefore there appears to be little learning actually taking place. Therefore this paper concludes that it is not enough to focus on regulated behaviour and the "academisation" of professionals through simply equipping them with tools and techniques and the technical 'know-how' to manage projects and teams. It has to be reinforced through sustained education. Thus it is argued that education must play a central role to act as a moral change agent. Evidence from this research demonstrates that failure to properly educate project managers has serious implications on their professional identity and credibility as practitioners. This can be alleviated by way of encouraging all PMs to engage in continuous learning and education through Continuing Professional Development (CPD) programs and become members of the professional body such as the Association of Project Managers (APM, UK), or the Project Management Institute (PMI), which gives international recognition. For aspiring PMs they should be encouraged to obtain professional qualifications and membership in project management in order to practice. This paper further concludes that professionals should be continually tested against the professional standards and behavioural competences as set out by their respective professional institutions. In this respect they will remain current with emergent knowledge, professional standards and legislation in an attempt to be held more accountable for their corporate social responsibility not only to their stakeholders but also to the

wider society. It is recommended that following further research, supported by empirical evidence, a new model of educational and leadership competencies for project managers could be developed.

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