



LEEDS
BECKETT
UNIVERSITY

Citation:

Njuangang, S and Abanda, H and Liyanage, C and Pye, C (2023) "Exploratory Sequential Mixed Method Research to Investigate Factors Affecting the Reputation of PFI/PF2 Projects in the UK." In: Akotia, J and Awuzie, BO and Egbu, C, (eds.) Mixed Methods Research Design for the Built Environment. Routledge, London. ISBN 100320404X, 9781003204046 DOI: <https://doi.org/10.1201/9781003204046-14>

Link to Leeds Beckett Repository record:

<https://eprints.leedsbeckett.ac.uk/id/eprint/10144/>

Document Version:

Book Section (Accepted Version)

The aim of the Leeds Beckett Repository is to provide open access to our research, as required by funder policies and permitted by publishers and copyright law.

The Leeds Beckett repository holds a wide range of publications, each of which has been checked for copyright and the relevant embargo period has been applied by the Research Services team.

We operate on a standard take-down policy. If you are the author or publisher of an output and you would like it removed from the repository, please [contact us](#) and we will investigate on a case-by-case basis.

Each thesis in the repository has been cleared where necessary by the author for third party copyright. If you would like a thesis to be removed from the repository or believe there is an issue with copyright, please contact us on openaccess@leedsbeckett.ac.uk and we will investigate on a case-by-case basis.

CHAPTER 14

Exploratory Sequential Mixed Method Research to Investigate Factors Affecting the Reputation of PFI/PF2 Projects in the UK

Stanley Njuangang, Henry Abanda, Champika Liyanage and Chris Pye

SUMMARY

The UK Government introduced the private finance initiative (PFI) as a measure to work closely with the private sector in the provision of public projects. Despite its popularity in the 90s, it presently faces strong criticisms for failing to deliver value for money. Different measures, i.e. PF2, by successive UK Governments have not changed the situation. The exploratory sequential mixed methods research design applied to investigating the reputation of PFI/PF2 projects in the UK is presented in this research. Grounded theory was the primary method for conducting the qualitative research phase. Thereafter, the themes were distilled and constituted the basis of a questionnaire survey using a five-point Likert Scale. The questionnaire was despatched to selected stakeholders in the construction industry and the data was analysed using the Relative Importance Index (RII) and Kruskal Wallis Test. Using the results of the RII, the most important factors affecting the reputation of PFI projects were selected for the development of a theoretical framework. Despite what appears to be disagreements amongst researchers on the true value of mixed methods research, the findings from using this approach made it possible for conclusions to be drawn from multiple perspectives. Hopefully, issues regarding the paradigmatic position of mixed methods research will be overlooked in favour of its contribution to investigating contemporary issues.

Introduction

The private finance initiative (PFI) scheme remains the most used type of public-private partnerships (PPP) in the UK's National Health Service (NHS). The PFI involves an arrangement whereby a private consortium, i.e. a Special Purpose Vehicle (SPV), may be asked to build and operate a new or redeveloped facility for a period of up to 30 years. PFI provides the government with an opportunity to widen the scope of private sector involvement in the provision of infrastructure and public services (Mercer & Whitefield, 2018). In the healthcare sector, it was introduced to "... attract private sector finance, management skills and expertise into the provision of public sector facilities and services" (Akintoye *et al*, 1998: 9).

Despite the government's rhetoric about the potential benefit of the scheme, there was the aspect that the private sector was very reluctant to embrace the idea entirely. As a result, in 1994, the new Chancellor, Kenneth Clark, made it mandatory for all capital projects, requiring the approval of the treasury, to explore the option of PFI in their proposals. According to Broadbent *et al*, (2004), such a "universal testing" policy was adopted without due consideration of the cost involved (especially in terms of legal and financial advisory cost) or exploration of the true value of the newly introduced change. These reasons explain why the policy was abandoned by the Labour Government after they won the 1997 elections. The Labour Government regarded the time and money spent on trying to develop models for "universal testing" as being a waste of valuable resources.

Subsequent changes instituted by the Labour Government did not immediately stimulate PFI schemes in the healthcare sector (Broadbent & Gill, 2003). According to Patel and Robinson

(2010), it took ten years after the launch of the first wave of PFI hospitals in 1995 for the NHS to witness any significant amount of PFI activities. By the onset of the last financial crises of 2007/08, there were 728 PFI projects, with a capital value (total worth of infrastructure assets) of just over £56 billion (Booth & Starodubtseva, 2015). However, following the crises, the cost of private borrowing increased and parliament became critical of PFI schemes for failing to demonstrate value for money to the taxpayers (NAO, 2018).

In 2012, the coalition government introduced an amended form of the PFI scheme, called Private Finance 2 (PF2). Although PF2 maintained many of the features of the original PFI scheme (Mercer & Whitefield, 2018), it was supposed to improve transparency and enforce greater accountability in the procurement and operation of projects. Also, in the new scheme, the coalition government held a minority equity stake and reduced the provision of soft services, i.e. cleaning waste management by special purpose vehicle. Even the creation of the Infrastructure and Projects Authority (IPA) to provide support functions to government departments for infrastructure and projects met with some criticisms. The National Audit Office (NAO) (2020), in its review, found that NHS Trusts were strategically unprepared to assume responsibility over PFI projects at the end of contract terms.

Following the criticisms levelled against the PFI scheme, in 2018, the UK Government announced that it was going to disband its application. Therefore, the fundamental issue for this research study was to investigate factors that affect the reputation of PFI/PF2 projects in the UK. Past and present literature was examined in depth to identify reasons for the unpopularity of PFI/PF2 schemes in the UK Healthcare Sector. Previous research in this area was focused mostly on measures to improve the financial performance of PPP/PFI schemes. Li *et al.* (2005) identified effective procurement, favorable economic conditions, and available financial market as being key issues in the implementation of PPP/PFI projects. Conversely, Carrillo *et al.* (2008) conducted their research on the participation, barriers, and opportunities in PFI in the UK.

An Overview of PFI/PF2 Projects

In a typical PFI project, the public and private sectors enter into a long-term contractual arrangement for up to 40 years. The SPV is formed specifically for a single project and usually comprises a construction company, a facilities management function and financier. In a typical PFI arrangement, 90% of the finance is drawn from debt and 10% from equity (National Audit Office, 2010). Since the debt portion of the financing consists of bank loans and/or bonds, the SPV pays interest for the risk incurred. The supposed interest is usually divided into two, i.e. the interbank rate, reflecting the general market risk, and loan margin, reflecting the project-specific risk. As risk stabilises over time, the variable bank rates are replaced with fixed monthly payments. The variable rate is converted into a fixed, long-term, interest rate that is paid over the life of the project.

Although the introduction of the PFI scheme might have attracted private finance and resulted in the building of new public projects, there is no clear evidence that it was better than other forms of procurement. According to the UK Government, “it only uses PFI where appropriate, and where it can deliver ‘value for money’ benefit” (Hill & Collins, 2004). Both Conservative and Labour Governments have rebuffed the idea that PFI was introduced to secure “off balance sheet” treatment for some public projects. According to the government, the public sector lacked the sort of expertise, innovation, and project management skills required for the successful delivery of projects. As a result, most public projects that were delivered through the traditional route, incurred time and cost overruns. Therefore, through

PFI schemes, the government hoped to achieve better value for money for the taxpayers. With over 88% of PFI projects being completed on time and within budget, proponents of the PFI scheme claimed that it offered value for money to taxpayers (Roe & Craig, 2004). According to the NAO, the vast majority of PFI projects were constructed close to the required time frames and budget (House of Commons, 2015).

So far in the UK, there have been success stories since the adoption of the PFI scheme. Unlike in the healthcare sector, with complex projects, most of the PFI success stories were in transport and prison services. For example, HMP Rye Hill was built in 16 months; following the traditional procurement route, the same prison would have taken three years to construct (Roe & Craig, 2004). In the transport sector, the widening of the M40 was also an example of a PFI project that was delivered early. The suggestion that these projects were completed on time does not mean that they performed well during the procurement, maintenance and facilities management (FM) phases of the projects. The Mid Yorkshire Hospitals Trust (MYHT) was an example of a £311 million PFI hospital that experienced problems during its operational phase. Faced with inefficiency and tightening of government spending on public services, it became difficult for MYHT to maintain monthly unitary payments (UNISON, 2013). In the transport sector, the government has bailed out PFI/PPP projects such as the Channel Tunnel Rail Link and the Royal Armouries Museum.

From the foregoing discussion, it is evident that the story of the success of PFI projects is a mixed one. In a separate report to HMP, the NAO (2003), cited by Edwards *et al.* (2004: 20), noted that “the use of the PFI is neither a guarantee of success nor the cause of inevitable failure. Like other forms of providing public services, there are successes and failures ...”. One thing is certain, even with the abandonment of new PFI schemes, the UK Government will still need the participation of the private sector to finance its infrastructure projects that currently amount to between 1.0% - 1.2% of the GDP each year. With the last PFI project set to end by 2050, relevant stakeholders must seek to manage its performance successfully. In 2016-17 alone, the total unitary charge payment made by the health bodies was £2 billion, representing 1.7% of the total cash budget for the Department of Health and Social Care (NAO, 2018). In the next section, the focus is on discussing the research methodology used to identify factors that affect the reputation of PFI/PF2 projects in the UK.

Research Methodology

As shown in Figure 14.1, exploratory sequential mixed methods research was used to investigate factors that affect the reputation of PFI/PF2 projects in the UK. According to Teddlie and Tashakkori (2008), this approach involves the analysis of qualitative data with the aim of developing a quantitative instrument to explore the research problem further. Although exploratory sequential mixed methods research has been applied differently by many authors, its primary purpose is to identify variables for use in quantitative measurement (Edmonds & Kennedy, 2017). This research was consistent with this purpose, where grounded theory was applied to identify and categorise factors that affect the reputation of PFI projects in the UK. Using the findings of qualitative research in the development of a quantitative research instrument increases the validity and reliability of the results (Shiyanbola *et al.*, 2021).

Although results based on the qualitative data are “exploratory” in nature (Creswell & Clark, 2018), they provide useful information for the interpretation of the overall results of the research. The results obtained from the qualitative content analysis are shown in the subsection about grounded theory, together with the Pearson Correlation Coefficient, which

shows mainly the similarity of the material coded in the different nodes. The primary purpose of conducting these analyses was to gain preliminary knowledge to inform further investigation. In the quantitative phase, data was analysed using Cronbach's alpha, RII and the Kruskal Wallis Test. Of importance is the level of integration between the qualitative and quantitative research methods. In this case, the point of interface between the qualitative and quantitative research phases was in the development of the research instrument for conducting the quantitative research and development of the theoretical framework. The list below shows the different stages in carrying out the qualitative and quantitative phases of the research:

- **Qualitative research phase:**
 - Grounded theory and selection of relevant research material:
 - Open coding: developing the themes
 - Axial coding: developing the parent and child nodes
 - Development of the research instrument
 - Selective coding: development of the theoretical framework
- **Quantitative research phase**
 - Demographic analysis
 - Quantitative data analysis and results
- **Joint display of the qualitative and quantitative results**

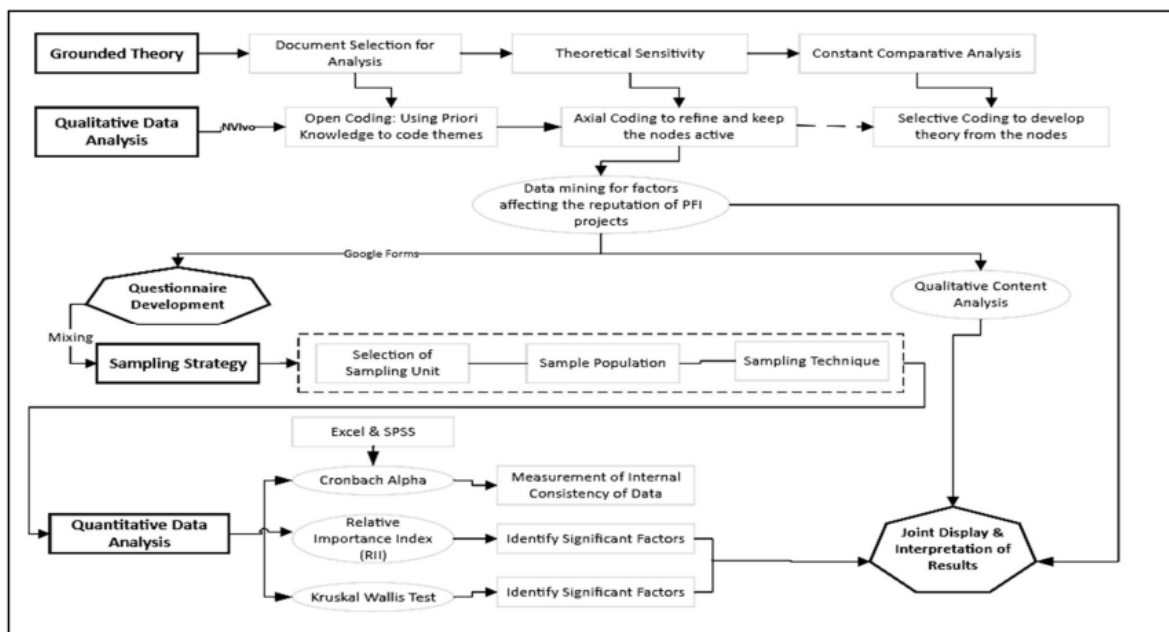


Figure 14.1: Exploratory sequential mixed methods for identifying factors affecting reputation of PFI/PF2 projects (Source: Original)

Qualitative Research Phase

In the current study, qualitative research was conducted using the grounded theory method, involving open, axial, and selective coding of themes in selected research materials. The process of coding the material into the different “parent” and “child” nodes was done using the application of qualitative QSR NVivo 12 Software. The themes coded in the nodes were refined and analysed using exploratory content analysis. These processes are explained in-depth in the following sub-sections.





































Grounded Theory and Selection of Research Materials

Developed by Glaser and Strauss in 1967, grounded theory (GT) is regarded by many as the metaphor of qualitative research. This is because GT allows for critical thinking and discovery without prior knowledge (Mengye & Simon, 2021). Irrespective of the strand of GT, there are three fundamental principles for the development of theory (Bulawa, 2014). The first, which is called theoretical sensitivity, enables the researcher(s) to become deeply immersed in relevant research material to understand salient issues about the research topic. On the other hand, theoretical sampling allows for the coding of data into different categories and sub-categories for the development of theory. Based on constant comparison, as new material emerges, the researcher moves forwards and backwards, refining the codes for sufficiency.

In similar research, in which literature was analysed using GT, Wolfswinkel *et al.* (2011) set the inclusion/exclusion criteria for the research material. For example, in the current research, all material for conducting GT analysis has relevance to PFI/PF2 projects in the UK. Databases, from which research materials were obtained, included Science Direct, Emerald, and Google Scholar. Some of the research materials were also drawn from relevant government bodies and online sources. The process of sourcing the research material for coding started with basic searches using words such as “PFI”, “procurement”, “reputation”, and “PPP”. This produced a list of materials about PFI, but did not reveal sufficient information about factors that affect the reputation of PFI projects in the UK. As a result, the search criteria were broadened to include words such as “criticism of PFI projects in the UK”, “growth of PFI in the UK” and “popularity of PFI in the UK”. Even then, the materials that were produced were not directly related to the research topic. Nonetheless, the search resulted in the identification of additional material from which the relevant issues could be inferred.

In total, 39 documents were selected for the next phase of the research that involved coding using QSR NVivo. Out of this number (see Table 14.1), 9 documents were drawn from journal papers (represented by green icons), 13 from UK Government Departments (red icons), and 14 from other professional organisations (purple icons). Only 25 of these documents contained material that was directly related to factors that affect the reputation of PFI projects in the UK. Information contained in the remaining 14 documents was used to support key arguments and facts in the literature review process. How these documents were analysed using the Straussian GT – open, axial and selective coding, is shown in the following sub-section.

Table 14.1: Selected documents with coding references and nodes

Name	Codes	References	Modified On	Modified By
 Bing Li et al. (2005)	3	6	16/06/2020 03:18	SN
 Carrillo et al. (2008)	8	12	16/06/2020 03:19	SN
 Hill & Collins (2004)	4	11	16/06/2020 03:28	SN
 Jaw-Kai Wang	0	0	16/06/2020 03:23	SN
 Neufville et al, 2007	0	0	16/06/2020 03:30	SN
 Parker (2009)	0	0	16/06/2020 03:31	SN
 ar2004-1269-1279_Akbiyikli_and_Eaton	1	8	16/06/2020 03:18	SN
 Gao et al. (n.d)	1	1	16/06/2020 03:26	SN
 Ning et al. (2004)	0	0	16/06/2020 03:35	SN
 House of Commons (2008)	8	172	24/06/2020 18:58	SN
 House of Commons (2003)	3	33	24/06/2020 17:29	SN
 House of Commons (2011)	7	23	24/06/2020 17:29	SN
 National Audit Office (2008)	2	6	24/06/2020 17:29	SN
 House of Commons (2011b)	1	1	24/06/2020 17:29	SN
 Northern Ireland Assembly (2011)	1	4	24/06/2020 17:30	SN
 National Audit Office (2010)	6	10	24/06/2020 17:30	SN
 National Audit Office (2009)	6	15	24/06/2020 17:34	SN
 HM Treasury (2003)	1	1	24/06/2020 17:34	SN
 House of Commons (2015)	8	24	24/06/2020 17:43	SN
 HM Treasury (2016)	0	0	24/06/2020 17:44	SN
 National Audit Office (2018)	12	52	24/06/2020 17:44	SN
 House of Commons (2003a)	0	0	24/06/2020 17:44	SN
 McKee et al. (2006) - WHO	8	23	24/06/2020 18:57	SN
 Roe & Craig (2004) - CPS	10	52	24/06/2020 17:33	SN
 Pollock et al. (2013)	3	4	24/06/2020 19:05	SN
 Hellowell (2014) - CHPI	3	6	24/06/2020 17:35	SN
 DeadWeight - Unison	3	4	24/06/2020 19:05	SN
 Edwards et al. (2004) - ACCA	5	13	24/06/2020 19:03	SN
 Lister (2003) - UNISON	2	4	24/06/2020 17:35	SN
 European Services Strategy Unit (2017)	6	10	24/06/2020 17:42	SN
 NHS Support Federation (n.d)	4	5	05/05/2020 23:40	SN
 PFIreport	0	0	05/05/2020 23:40	SN
 Broadbent et al. (2004) - CIMA	0	0	24/06/2020 19:04	SN
 PricewaterhouseCoopers	0	0	24/06/2020 19:08	SN
 CHPI-PFI-Return-Nov14-2 (2)	0	0	24/06/2020 19:05	SN
 Walker & Tizard (2018) - Smith Institute	0	0	24/06/2020 17:44	SN

Source: Original

- Coding and Development of the Research Instrument
Strauss and Corbin (1990: 61) defined open coding as “... the process of breaking down, examining, comparing, conceptualizing, and categorizing data”. In the present research, open coding was used primarily to identify and code materials for the development of categories and sub-categories. The process was assisted by “broad-brush” coding using qualitative QSR NVivo Version 13 Software. The software was

selected because it allowed for creation of “parent” and “child” nodes. Figure 14.2 shows the coding of materials from Carrillo *et al.* (2008) and European Services Strategy Unit (2017) into the “parent” node, called “procurement”.

With regards to the factors that affect the uptake of PFI projects in the UK, material was coded initially in seven parent nodes, namely: administration of contracts, controversies, financial factors, operation, risk allocation, staffing issues and sustainability. Interrogation of the nodes suggested the need for refinement and re-categorisation of parent nodes. In other areas, nodes were created, i.e. “definition of PFI”, “benefits and merits of PFI”, “PFI cases with issues” to help with the literature review process. Figure 14.2 shows a view of the material and percentage that was coded from two different sources (Carrillo *et al.*, 2008 – 0.47%; European Services Strategy Unit, 2017 – 0.41%) in the parent node called “procurement”.

Name: Procurement

<Files\\PFI\Carrillo et al. (2008)> - § 1 reference coded [0.47% Coverage]

Reference 1 - 0.47% Coverage

The figures show that the majority of client and construction organizations believe that the bidding costs of PFI are higher, regardless of project size, whereas only a third believe these costs are higher for the design and construction phases. The main reason for this is the cost of the specialist expertise required during the bidding stage and the lengthy negotiation periods for PFI projects.

<Files\\PFI\European Services Strategy Unit (2017)> - § 5 references coded [0.41% Coverage]

Reference 1 - 0.05% Coverage

Abandoned projects
Sixteen PFI/PPP projects were cancelled at a cost of £114.3m. The cost would be significantly higher if information was publicly available for other cancelled projects.

Reference 2 - 0.14% Coverage

A large and complex contract is at the centre of every PFI/PPP project. A standard draft contract is amended and developed as procurement proceeds up to the point of financial closure. The final contract or project agreement can range from a few hundred to several thousand pages. But no matter how comprehensive they are, virtually all contracts are incomplete in practice (Hart, 2003), because they cannot predict future events and changing economic and social needs. Tirole (1999) identifies three reasons for incomplete contracts:

Figure 14.2: Sample of themes coded in node, called “procurement” (Source: Original)

The process of axial coding involved working through the nodes looking for similarities, relationships and opposites of factors that affect the reputation of PFI projects. Through constant comparison, i.e. moving forwards and backwards to update and keep the nodes active, the decision was taken to split some of the nodes. For example, the child node called “administration of PFI contracts” was cascaded under the parent node called “Procurement”. Similarly, re-financing was added as a child node under the node called “Finance”. So far, the factors that affect the reputation of PFI projects in the UK were grouped under seven parent

nodes, i.e. procurement, administration, finance, operation, staffing, risk, and sustainability (Table 14.2 shows a list of factors under “Procurement”).

Whilst QSR NVivo Software is used mainly for qualitative data analysis, it nonetheless provides a function for cluster analysis, using similar words and attributes coded in the different parent and child nodes. Given the subjectivity of the results, the use of clusters in this research, and those of the qualitative content analysis, was mainly exploratory. The results of the Pearson Correlation Coefficient showed correlation between “finance and administration of PFI contracts” ($p = 0.768$); “staffing issues” and “procurement” ($p = 0.707$) (refer to Table 14.3).

With the help of qualitative content analysis, raw data in the different nodes were distilled and consolidated as variables in the questionnaire. In total, 91 factors were identified and categorised into the initial parent nodes as follows: procurement (23 factors), administration (15 factors), finance (23 factors), operations (7 factors), staffing (6 factors), risk (9 factors), and sustainability (8 factors). Table 14.2 shows a list of documents (PR1, PR2, PR3, PR4, PR5) from which factors related to procurement were taken. The table also shows the number of times a factor was coded from each of these documents.

Table 14.2: Refined factors in the procurement nodes

Primary Nodes	Factors Affecting uptake of PFI Projects in the UK (n = 23)	References (x) (n = 31)							%
		PR-1	PR-2	PR-3	PR-4	PR-5	PR-6	PR-7	
Procurement	1. High bidding prices regardless of project size	X							14
	2. Abandonment & cost terminating of PFI projects		X				X		29
	3. Lack of public information about cost of project		X						14
	4. Over specification & complexity of projects that are difficult to understand thus deterring potential bidders		X	X		X			43
	5. Difficulty predicting demands, changes in economic & social needs		X						14
	6. Revision of public policy priorities, technologies and operations		X						14
	7. Performance of private sector consortia (construction, banks, facilities management contractors)		X						14
	8. Emphasis on achieving project outcomes rather than quality of inputs, processes & outputs		X						14
	9. Inability to resolve & enforce terms of contract without courts		X						14
	10. Cost on specialist expertise (i.e. legal fee) to advice on contract	X						X	29
	11. Lengthy contract negotiation periods	X		X					29
	12. Incentives that are unconnected to value for money & flexible designs			X	X				29
	13. Weak assessment criteria resulting to unsuitable PFI projects			X		X			29
	14. Failure to compare PFI projects against government borrowing			X					14
	15. Increased cost for PFI projects at the stage of financial close			X					14
	16. Run-down public-sector departments i.e. architecture & planning to handle procurement				X				14
	17. Public sector inability to provide complete drawings & specifications of end product				X			X	29

Source: Original

Table 14.3: Correlation between the different nodes (QSR NVivo Version 12)

Code A	Code B	Pearson correlation coefficient
Financial factors	Administration Contracts	0.768
Staffing Issues	Administration Contracts\Procurement	0.707
Administration Contracts\Procurement	Administration Contracts	0.691
Administration Contracts\Procurement	Financial factors	0.530
Risk Allocation	Administration Contracts	0.477
Staffing Issues	Administration Contracts	0.397
Risk Allocation	Administration Contracts\Procurement	0.313
Operation	Administration Contracts	0.250
Risk Allocation	Operation	0.250
Risk Allocation	Financial factors	0.233
Staffing Issues	Risk Allocation	0.215
Staffing Issues	Financial factors	0.211
Administration Contracts\Procurement	Operation	0.195
Administration Contracts\Procurement	Controversies	0.182
Financial factors\Re-Financing	Financial factors	0.171
Staffing Issues	Operation	0.147
Operation	Financial factors	0.133
Sustainability	Staffing Issues	0.099
Operation	Controversies	0.060
Sustainability	Controversies	0.041
Sustainability	Financial factors\Re-Financing	-0.066
Staffing Issues	Controversies	-0.088
Financial factors\Re-Financing	Operation	-0.098
Controversies	Administration Contracts	-0.137
Risk Allocation	Controversies	-0.137
Financial factors\Re-Financing	Administration Contracts\Procurement	-0.141
Sustainability	Operation	-0.142
Staffing Issues	Financial factors\Re-Financing	-0.156
Financial factors\Re-Financing	Controversies	-0.187
Financial factors	Controversies	-0.195
Financial factors\Re-Financing	Administration Contracts	-0.204
Risk Allocation	Financial factors\Re-Financing	-0.204
Sustainability	Administration Contracts\Procurement	-0.204
Sustainability	Administration Contracts	-0.295
Sustainability	Risk Allocation	-0.295
Sustainability	Financial factors	-0.385

Source: Original

Unlike in open and axial coding, the material used in the selective coding was refined i.e. 91 factors that affect the reputation of PFI projects. Following interrogation, the lists of factors in the different categories were integrated into a central concept for the development of theory. In this research, the core category or central concept was the category or node called “procurement of PFI projects”. Given the number of factors involved, they were analysed for level of significance, using the Relative Importance Index (RII). In terms of selective coding, the refined list of factors and results of RII were used in the development of a theoretical framework of factors that affect the reputation of PFI/PF2 projects in the UK (see Figure 14.2).

Quantitative Research Phases

Quantitative research involves subjecting quantitative data to rigorous quantitative analysis in a formal or rigid fashion (Goddard & Melville, 2004). Quantitative research can be subdivided into simulation, experimental and inferential methods of research (Goddard & Melville, 2004). Experimental research involves research in which the researcher has greater control over the research environment. The simulation approach is appropriate for researchers interested in building models for the understanding of future conditions. In this study, inferential research was applied based on a survey. This involved conducting an in-depth study of a sample of the population (through questioning), with the intention of inferring the characteristics of the rest of the population.

With the use of questionnaires, enabled by Google Forms, the 91 factors that were found to affect the reputation of PFI projects, were presented in a five-point Likert Scale. Google Forms made it easier for the questionnaire to be circulated electronically to a wider audience. Out of the 250 questionnaires distributed through LinkedIn, and Facebook groups for construction professionals, i.e. quantity surveyors, construction project managers, building surveyors etc., only 26 were returned successfully. Without being able to increase the number of responses, the decision was taken to analyse the data using a non-parametric test. According to Pett (2016), a non-parametric test could accommodate small sample sizes and data with irregular sample distributions. It is not uncommon for mixed methods research to have varied response rates (Abowitz & Toole, 2010). Most of the respondents (56%) had working experience of 11+ years, working in the construction industry. They were mainly quantity surveyors, project managers, building surveyors (working in different areas of the construction industry) and academics. In the next section, the quantitative data analysis and results are discussed.

Quantitative Data Analysis and Results

Data was analysed using quantitative Microsoft Excel and SPSS Software. While the former was used to analyse the relative importance index (RII) of factors that affect the reputation of PFI projects, the latter was used to examine the level of statistical differences between the different sub-groups. According to Johnson and LeBreton (2004, cited by Somiah *et al.*, 2015: 120), “RII aids in finding the contribution a particular variable makes to the prediction of a criterion variable both by itself and in combination with other predictor variables”. The results for RII were in the range $0 \leq \text{RII} \leq 1$, with higher scores indicating higher levels of relative importance. The formula below was used to determine the RII:

$$\text{RII} = \Sigma W / (A \times N) \qquad \text{(Equation 1)}$$

Where, W = weighting given to each statement by the respondents and ranges from 1 to 5; A = higher response; integer (5); and N = total number of respondents.

Table 14.4 shows the results of the RII for some of the factors in the financial category. Out of the 91 factors, failure of government departments to recognise the complexity of refinancing emerged as the 5th most important factor affecting the reputation of PFI projects. The Kruskal Wallis Test was used to establish the level of disagreement between the different groups of respondents according to type of organisation, experience, and profession (see Tables 14.4 and 14.5). The test could be used to compare the mean of three or more distinct groups. In the current research, under organisation, there were 4 groups – client, main contractor, sub-contractor, consultancy, and academia. Conversely, under profession, there

were 6 groups – director, building surveyor, project manager, quantity surveyor, and academics. The test made it possible to establish whether significant differences existed in the way the different groups rated factors that affect the reputation of PFI projects. *Post hoc* analysis involved using the mean scores to indicate groups with higher and lower levels of consensus. The level of statistical significance for this research was set at $p = 0.05$.

Given the scope of this research, it was not possible to discuss all the results of the quantitative analysis. However, under the category called “administration of PFI contracts”, there were significant differences ($p = 0.027$) between the different groups of professionals regarding “lack of public scrutiny of PFI on grounds of commercial confidentiality”. Disagreement on this issue was mainly between academics (mean = 4.30) and QS (mean = 2.50), and PM (mean = 2.50). On the issue of “lack of information sharing and transparency”, there was lack of consensus ($p = 0.030$) between the different groups of respondents. On this factor, there was a stronger level of agreement between academics (mean = 4.29) and QS (mean = 4.25); there was a lower mean score for project managers (mean = 2.3) and directors (mean = 3.00).

Joint Display of the Qualitative and Quantitative Results

The results of this research include those of the qualitative and quantitative data analysis. The key results of the qualitative data analysis include those for the identification of factors that affect the reputation of PFI projects. Table 14.4 shows how the list of factors under “financial category” was used in the development of the questionnaire and analysed using RII and the Kruskal Wallis est. This represents the first point of integration that is crucial for qualifying mixed methods research (Schoonenboom & Johnson, 2017).

Table 14.4: Financial factors that affect the reputation of PFI projects

	Likert Scales						RII	Ranking for Category	Overall Ranking	Kruskal Wallis Test						
	1	2	3	4	5	Experience				Organisation	Profession					
Financial Issues (N = 23)						0.681 (4)										
FI-1	High cost involved in the tendering process					2	6	8	9	0.762	3	9	0.793	0.139	0.390	
FI-2	Cost constraints initiating innovation in PFI projects					3	6	11	4	0.677	11	46	0.330	0.323	0.259	
FI-3	Failure of government departments to recognise & understand the complexity of refinancing					1	8	4	12	0.785	1	5	0.876	0.336	0.881	
FI-4	Financial bailouts that benefit PFI NHS Trusts					1	2	9	10	3	0.669	14	52	0.349	0.806	0.732
FI-5	Financial consequences resulting from changing scope of project					1	6	10	8	0.769	2	8	0.259	0.424	0.460	
FI-6	Requirement for private sector to keep more than 50% of refinancing gains if making less profit					1	2	12	6	4	0.654	16	65	0.096	0.637	0.376
FI-7	Reward to private sector companies for delivering inefficiencies					2	6	9	4	4	0.592	22	87	0.424	0.450	0.420
FI-8	Treatment of PFI projects as off-balance sheet debt					4	10	8	3	0.654	16	65	0.825	0.608	0.030	
FI-9	Creation of mortgage for the future generation					4	7	11	3	0.677	11	46	0.209	0.287	0.142	
FI-10	Failure of lenders to withhold funding to trigger financial review of project					4	7	9	5	0.692	7	34	0.018	0.476	0.834	
FI-11	Unwillingness of private sector to participate in voluntary code to share refinancing gains					6	8	5	6	0.662	15	59	0.178	0.403	0.125	
FI-12	Lack of confidence in the financial models applied in the private sector					2	5	6	8	4	0.631	20	76	0.189	0.309	0.424
FI-13	Excessive return to the private sector that does not reflect level of risk					2	4	7	7	5	0.646	19	69	0.885	0.704	0.121
FI-14	Inability of private sector to operate efficiently and economically					2	9	4	5	5	0.592	22	87	0.106	0.414	0.111
FI-15	Annual charges that are far higher than traditional forms of payment					2	8	8	7	0.731	4	21	0.882	0.304	0.058	
FI-16	Wide & unexplained variations in the cost of facilities management services in PFI hospitals					6	3	13	3	0.677	11	46	0.027	0.376	0.044	
FI-17	Funding & budgeting mechanisms that make on balance sheet projects less attractive					3	9	9	4	0.685	10	43	1.000	0.269	0.405	

Source: Original

The second point of integrating the qualitative and quantitative research occurred at the results interpretation level to answer the research questions. The results of the qualitative as

well as quantitative phases of this research are presented using a joint display in Table 14.5. Joint display makes it possible for data to be visually brought together (Berman, 2017) to “draw out new insights beyond the information gained from the separate quantitative and qualitative results” (Berman, 2017, cited by Fetters, Curry & Creswell, 2013: 2143). As shown in Table 14.5, the results of the exploratory content analysis are presented side by side with those of the RII. In terms of exploratory content analysis, “excessive return to the private sector that does not reflect risk” was ranked the most important factor (36%, F13). With RII of 0.646, this factor was ranked 19 out of the 23 factors in the financial category; it was also ranked 69 out of 91 factors for all categories. Whilst the research of the content analysis was mainly exploratory in nature, it provided useful information about how some of these issues were viewed by different authors.

Table 14.5: Joint display of qualitative and quantitative data (factors that affect the reputation of PFI projects)

Codes	Doc-1	Doc-2	Doc-3	Doc-4	Doc-5	Doc-6	Doc-7	Doc-8	Doc-9	Doc-10	Doc-11	Doc-12	Doc-13	Doc-14	%	Likert Scales					RII	Ranking for Category	Overall Ranking	Kruskal Wallis Test		
																1	2	3	4	5				Experience	Organisation	Profession
																	0.681 (4)									
FI-1		X								X					14	2	6	8	9	0.762	3	9	0.793	0.139	0.390	
FI-2	X			X											14	3	6	11	4	0.677	11	46	0.330	0.323	0.259	
FI-3													X		7	1	8	4	12	0.785	1	5	0.876	0.336	0.881	
FI-4			X	X											14	1	2	9	10	0.669	14	52	0.349	0.806	0.732	
FI-5				X											7	1	6	10	8	0.769	2	8	0.259	0.424	0.460	
FI-6														X	7	1	2	12	6	0.654	16	65	0.096	0.637	0.376	
FI-7				X											7	2	6	9	4	0.592	22	87	0.424	0.450	0.420	
FI-8						X		X					X		21	4	10	8	3	0.654	16	65	0.825	0.608	0.030	
FI-9													X		7	4	7	11	3	0.677	11	46	0.209	0.287	0.142	
FI-10				X								X			14	4	7	9	5	0.692	7	34	0.018	0.476	0.834	
FI-11														X	7	6	8	5	6	0.662	15	59	0.178	0.403	0.125	
FI-12				X											7	2	5	6	8	0.631	20	76	0.189	0.309	0.424	
FI-13					X	X	X				X	X			36	2	4	7	7	0.646	19	69	0.885	0.704	0.121	
FI-14				X											7	2	9	4	5	0.592	22	87	0.106	0.414	0.111	
FI-15						X							X		14	2	8	8	7	0.731	4	21	0.882	0.304	0.058	
FI-16					X					X					14	6	3	13	3	0.677	11	46	0.027	0.376	0.044	
FI-17					X			X					X		21	3	9	9	4	0.685	10	43	1.000	0.269	0.405	

Source: Original

The refined list of factors and results of the RII were used in the development of the theoretical framework of factors that affect the reputation of PFI/P2 projects in the UK. Apart from merely showing the relation between the different factors, using RII also made it possible to show their level of significance. The theoretical framework also provided room for the qualitative as well as quantitative results to be displayed jointly. Only the most important factors (20) drawn from the categories were used here. As shown in Figure 14.3, the numbers in the circles represent the overall rank of the factors. This shows, for example, the link between “lack of public information about the true cost of PFI/PF2 projects” and “imbalance of power, skills and knowledge between the private and public sectors”.

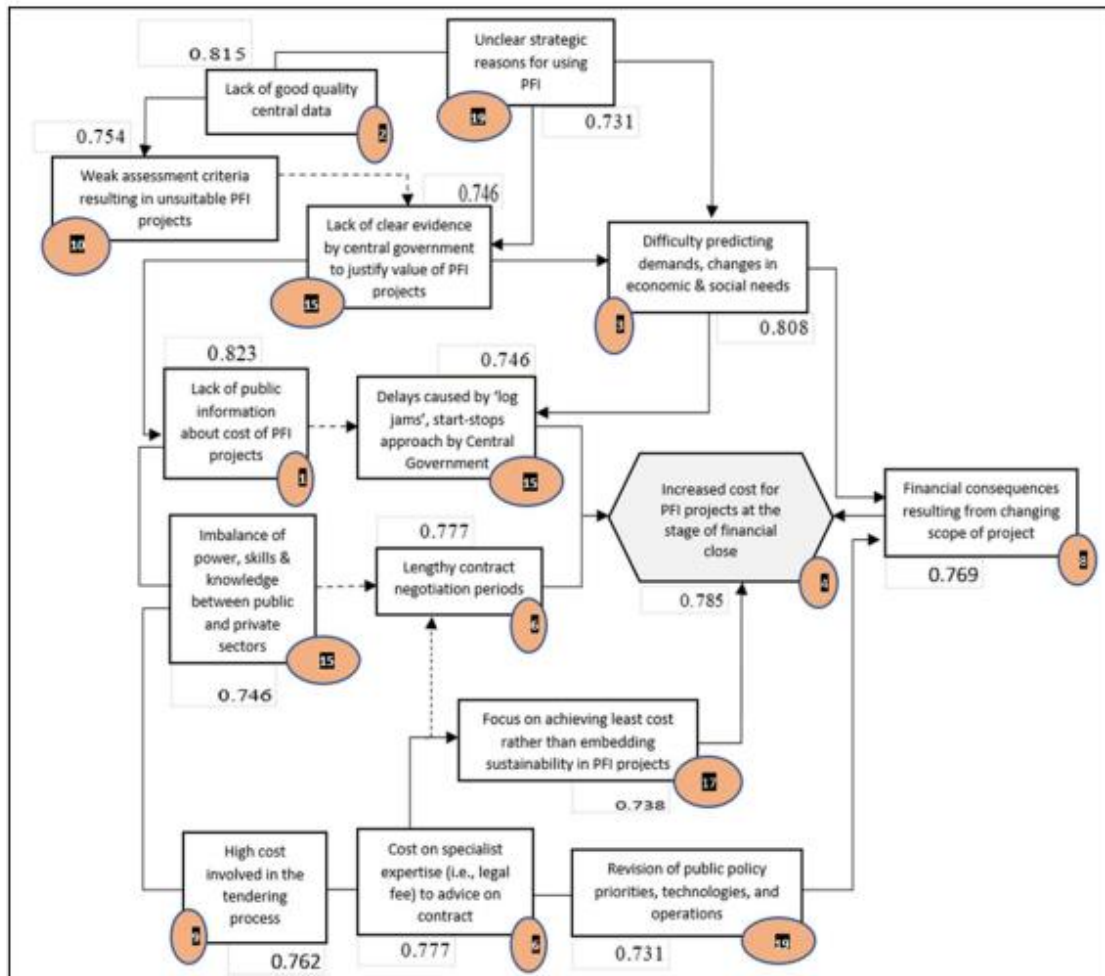


Figure 14.3: Theoretical frameworks of factors that affect the reputation of PFI projects
(Source: Original)

Discussion of Findings and Implications of the Research Design

Mixed methods research involves separate analysis of qualitative and quantitative data to address the research questions. In the first phase of this research, relevant research material was analysed using the Straussian grounded theory, involving open, axial and selective coding. Themes contained in the different nodes were analysed and refined for the development of the research instrument. In total, 91 factors were identified and grouped into seven parent nodes. The results of the qualitative content analysis were mainly exploratory based on an interrogation of literature about issues that affect the reputation of PFI projects in the UK. The results suggested that these issues had not been given the right attention. Concerning the quantitative phase of the research, data generated from the administration of a questionnaire survey were analysed using RII and the Kruskal Wallis Test. This constituted an important point of integrating the qualitative and quantitative results. According to Berman (2017: 7), “the use of both qualitative and quantitative data collection methods in a single study is not sufficient enough to categorize a study as ‘mixed methods’”. The true value of mixed research lies in the mixing of the two strands of data.

The chapter also showed how the results of the qualitative and quantitative phases of the research could be jointly displayed to bring more meaning to the phenomena under discussion. This is an important characteristic and strength of mixed methods research. In this case, the refined list of the factors, results of the exploratory content analysis and RII were presented side-by-side. The qualitative results provided useful information about how these issues are addressed in the literature. On the other hand, the quantitative results provided information about their level of significance. Both sets of results were then used to develop a theoretical framework of factors that affect the reputation of PFI/PF2 projects in the UK.

Conclusion

The chapter contains a discussion of different steps involved in exploratory sequential mixed methods research used to investigate factors that affect the reputation of PFI projects in the UK. In the chapter, the process involved in selecting documents for conducting grounded theory, applying open, axial and selected coding, was shown. Use of open coding enabled the identification of a list of factors that affect the reputation of PFI/PF2 projects in the UK. Through iteration in axial coding, the factors were categorised and the coded material was merged. For example, the parent nodes of finance and re-finance were merged to provide for clarity. In total, the process resulted in the identification of seven categories containing 91 factors. The lists of factors in the different categories were used to develop a questionnaire survey that was despatched to selected individuals in the construction industry.

One of the strengths of the mixed research methodology is the integration and joint display of the results. The first level of integration of the qualitative and quantitative research occurred when the refined list of factors that was developed using grounded theory analysis, was transformed into a survey questionnaire. The data were analysed using RII and jointly displayed with the results of the exploratory content analysis. Tables 14.4 and 14.5 show the most important factors identified using exploratory content analysis and RII. Both results were then used to inform the selective coding process for the development of the theoretical framework of factors that affect the reputation of PFI/PF2 projects in the UK.

References

- Abowitz, D.A., Toole, T.M. 2010. Mixed method research: Fundamental issues of design, validity, and reliability in construction research. *Journal of Construction Engineering and Management*, 136, pp. 108-116. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0000026](https://doi.org/10.1061/(ASCE)CO.1943-7862.0000026)
- Berman, E. 2017a. An exploratory sequential mixed methods approach to understanding researchers' data management practices at UVM: Integrated findings to develop research data services. University Libraries Faculty and Staff Publications. <https://doi.org/10.7191/jeslib.2017.1104>
- Berman, E. 2017b. An exploratory sequential mixed methods approach to understanding researchers' data management practices at UVM: Integrated findings to develop research data services. University Libraries Faculty and Staff Publications. <https://doi.org/10.7191/jeslib.2017.1104>
- Brown, I. & Roode, D. 2004. Using grounded theory in the analysis of literature: The case of strategic information systems planning. In: *ACIS 2004 Proceedings*.
- Bryman, A. 1984. The debate about quantitative and qualitative research: A question of method or epistemology? *The British Journal of Sociology*, 35, pp. 75-92. <https://doi.org/10.2307/590553>

- Buber, R., Gadner, J. & Richards, L. 2004. *Applying Qualitative Methods to Marketing Management Research*. Houndmills, Basingstoke, Hampshire; New York: Palgrave Schol, Print UK.
- Bulawa, P. 2014. Adapting grounded theory in qualitative research: Reflections from personal experience. *International Research in Education*, 2, pp. 145-168. <https://doi.org/10.5296/ire.v2i1.4921>
- Carrillo, P., Robinson, H., Foale, P., Anumba, C. & Bouchlaghem, D. 2008. Participation, barriers, and opportunities in PFI: The United Kingdom experience. *Journal of Management in Engineering*, 24, pp.138-145. [https://doi.org/10.1061/\(ASCE\)0742-597X\(2008\)24:3\(138\)](https://doi.org/10.1061/(ASCE)0742-597X(2008)24:3(138))
- Creswell, J.W. & Plano Clark, V.L. 2018. *Designing and Conducting Mixed Methods Research*. Thousand Oaks, CA: SAGE.
- Creswell, J.W. & Clark, V.L.P. 2007. *Designing and Conducting Mixed Methods Research*. SAGE Publications.
- De Loo, I. & Lowe, A. 2011. Mixed methods research: Don't "just do it." *Qualitative Research in Accounting and Management*, 8, pp. 2238. <https://doi.org/10.1108/11766091111124685>
- Doyle, L., Brady, A.-M. & Byrne, G. 2009. An overview of mixed methods research. *Journal of Research in Nursing* 14, pp. 175-185.
- Dunne, C. 2011. The place of the literature review in grounded theory research. *International Journal of Social Research Methodology*, 14, pp. 111-124. <https://doi.org/10.1080/13645579.2010.494930>
- Edmonds, W. & Kennedy, T. 2017. *An Applied Guide to Research Designs: Quantitative, Qualitative, and Mixed Methods*. <https://doi.org/10.4135/9781071802779>
- Fetters, M.D., Curry, L.A. & Creswell, J.W. 2013. Achieving integration in mixed methods designs – Principles and practices. *Health Services Research*, 48, pp. 2134-2156. <https://doi.org/10.1111/1475-6773.12117>
- Gilbert, G.N. 1995. Simulation as a research strategy. In: *Social Science Microsimulation*. Springer, pp. 448-454.**
- Gilbert, G. N. (1996): Simulation as a research strategy. In: Troitzsch, K. G., Müller, U., Gilbert, G. N. & Doran, J. E. (eds.) *Social science microsimulation*. Springer, Berlin, 448–454.
- Goddard, W. & Melville, S. 2004. *Research Methodology: An Introduction*. Juta and Company Ltd.
- Graff, J. C. 2017. An integrative approach to research, administration and practice. In: L.A. Roussel & H.R. Roussel (eds). *Mixed Method Research*. Burlington, MA: Jones & Bartlett Learning, pp. 47-65.
- Hair, J.F., Anderson, R.E., Tatham, R.L. & Black, W.C. 1998. *Multivariate Data Analysis*. 5th edition. Prentice-Hall, Englewood Cliffs, NJ.
- Hall, H.R. & Roussel, L.A. (eds). 2017. *Evidence-Based Practice: An Integrative Approach to Research, Administration, and Practice*. 2nd edition. (ed) Jones & Bartlett Learning, Burlington, MA.
- Johnson, B. & Onwuegbuzie, A. 2004. Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7): 14-26.
- Malina, M.A., Nørreklit, H.S.O. & Selto, F.H. 2011. Lessons learned: Advantages and disadvantages of mixed method research. *Qualitative Research in Accounting & Management*, 8, pp. 59-71.
- Morse, J.M., Niehaus, L. 2009. *Mixed Method Design: Principles and Procedures, Developing Qualitative Inquiry*. Left Coast Press, Walnut Creek, Calif.

- Sale, J.E.M., Lohfeld, L.H. & Brazil, K. 2002. Revisiting the quantitative-qualitative debate: Implications for mixed-methods research. *Quality & Quantity*, 36, pp. 43-53. <https://doi.org/10.1023/A:1014301607592>
- Schoonenboom, J. & Johnson, R.B. 2017a. How to construct a mixed methods research design. *Kolner Z Soz Sozpsychol*, 69, pp. 107-131. <https://doi.org/10.1007/s11577-017-0454-1>
- Schoonenboom, J. & Johnson, R.B., 2017b. How to construct a mixed methods research design. *Köln Z Soziol* 69, 107-131. <https://doi.org/10.1007/s11577-017-0454-1>
- Shiyanbola, O.O., Rao, D., Bolt, D., Brown, C., Zhang, M. & Ward, E. 2021. Using an exploratory sequential mixed methods design to adapt an Illness Perception Questionnaire for African Americans with diabetes: The mixed data integration process. *Health Psychol Behav Med*, 9, pp. 796-817. <https://doi.org/10.1080/21642850.2021.1976650>
- Somiah, M.K., Osei-Poku, G. & Aidoo, I. 2015. Relative importance analysis of factors influencing unauthorized siting of residential buildings in the Sekondi-Takoradi Metropolis of Ghana. *JBCPR*, 3, pp. 117-126. <https://doi.org/10.4236/jbcpr.2015.33012>
- Strauss, A. & Corbin, J.M. 1990. *Basics of qualitative research: Grounded theory procedures and techniques*. Sage Publications, Inc, Thousand Oaks, CA, US.
- Tashakkori, A. & Creswell, J.W. 2007. Editorial: The new era of mixed methods. *Journal of Mixed Methods Research*, 1, pp. 3-7. <https://doi.org/10.1177/2345678906293042>
- Tashakkori, A. & Creswell, J.W. 2008. Mixed methodology across disciplines. *Journal of Mixed Methods Research*.
- Teddlie, C. & Tashakkori, A. 2009. *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences*. SAGE.
- Teddlie, C. & Tashakkori, A. 2008. *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences*. 1st edition. SAGE Publications, Inc, Los Angeles.
- Whitefield, D. 2017. PFI/PPP buyouts, bailouts, terminations and major problem contracts in UK. *International Journal of Doctoral Studies*, 16, 553-568.
- Wolfswinkel, J., Furtmueller, E. & Wilderom, C. 2013. Using grounded theory as a method for rigorously reviewing literature. *European Journal of Information Systems*, 22. <https://doi.org/10.1057/ejis.2011.51>
- Yu, M. & Smith, S.M. 2021. Grounded theory: A guide for a new generation of researchers. *International Journal of Doctoral Studies*, 16, pp. 553-568.