

The Role of the DQI in Managing Stakeholder Requirements in Construction Projects

John M. Kamara¹

Abstract

The Design Quality Indicator (DQI) tool was developed to allow stakeholders connected with a construction project to define indicators that can be used to assess the design and construction quality of a building. While it is primarily focused on design quality issues, it also fosters communication and the management of expectations among stakeholders at various stages of a project. This paper explores how the DQI contributes to the management of stakeholder requirements on construction projects. A review of stakeholder management principles in construction is followed by an overview of the DQI tool with respect to its underlying philosophy and practical application on projects. Case studies on how DQI was used on particular projects and the perceptions of users are then presented and discussed against their potential contribution to stakeholder requirements management. The paper concludes with insights into the possibilities and constraints in the use of the tool.

Keywords: Clients, Construction Projects, DQI, Stakeholder Requirements Management

1. Introduction

The development and delivery of construction projects involves various stakeholders who influence or are affected by such projects. While the client, as promoter of the project, is central to this process, the needs and expectations of many other groups (e.g. users, designers, legal authorities, the general public, etc.), which can sometimes be contradictory, need to be incorporated and/or accommodated in a project (Kamara et al. 2002). The effective management of these stakeholders is therefore now considered as a key ingredient to project success (Newcombe, 2003; Olander, 2007; Chinyio and Olomolaiye, 2010).

The categories of stakeholders and their relative influence on a project varies depending on the type of project and stakeholder. They can be individuals or groups, or they can be internal to the client organisation, or external to it. A key strategy for their effective management on a project is the identification and assessment of their relative importance on a project (Olander, 2007). Various approaches for stakeholder have also been proposed (e.g. Chinyio and Akintoye, 2008; Manowong and Ogunlana, 2010; van Gunsteren, 2011). This paper explores the role of the Design Quality Indicator (DQI) tool in managing stakeholder requirements in construction projects. DQI was developed in the UK to allow stakeholders connected with a project to define and assess the design and construction

¹ School of Architecture, Planning and Landscape, Newcastle University, Newcastle upon Tyne, NE1 7RU, UK; Email: john.kamara@ncl.ac.uk

quality of a building. Whilst it is primarily focused on design quality issues, it also fosters communication and the management of expectations among stakeholders at various stages of a project (the focus of this paper is on the latter and not on assessing design quality outcomes). A review of stakeholder management in construction is followed by an overview of the DQI tool with respect to its underlying philosophy and practical use at various stages of a project. Case studies on how it was used on particular projects and the perceptions of users are then presented and discussed against the principles of stakeholder management. The paper concludes with insights into the possibilities and constraints in the use of the tool.

2. Stakeholder Management in Construction

The importance of stakeholders and the need for their management on construction projects is now becoming well recognised. At the very least the regulatory requirements imposed on projects through, for example, the planning and development control process in many countries, requires the consideration of interests other than those of project promoters. But usually, given the complex and uncertain nature of construction projects, the active consideration of stakeholder requirements is necessary for project success (Newcombe, 2003; Olander, 2007; Van Gunsteren; 2011). Stakeholders “are persons or groups with legitimate interest in the procedural and/or substantive aspects of corporate activity” (Amaeshi, 2010:16). From a construction project perspective, Olander (2007:279) defines a stakeholder as “a person or group of people who has a vested interest in the success of a project and the environment within which the project operates, [with] vested interest...defined as having possession of one or more of the stakeholder attributes of power, legitimacy or urgency.” These, and the many other definitions of the concept, suggest that there are different types (e.g. individual or group) and categories (e.g. with respect to the relative influence on a project) of stakeholders. These categories include: internal and external stakeholders (i.e. those actively involved in project implementation, and those directly affected by the project, respectively) (Olander, 2007; Leung and Olomolaiye, 2010); and primary and secondary stakeholders (i.e. those with whom a firm has a fiduciary obligation to, and those where such obligations do not exist, respectively) (Amaeshi, 2010). Other categorisations by Newcombe (2003); Smyth (2008) and Chinyio and Akintoye (2008) are more generic and relate to how the relative influence of stakeholders can be mapped. An example of this, which is illustrated in Figure 1, compares the power to influence against the level of interest of stakeholders as a way to determine the strategies for their management.

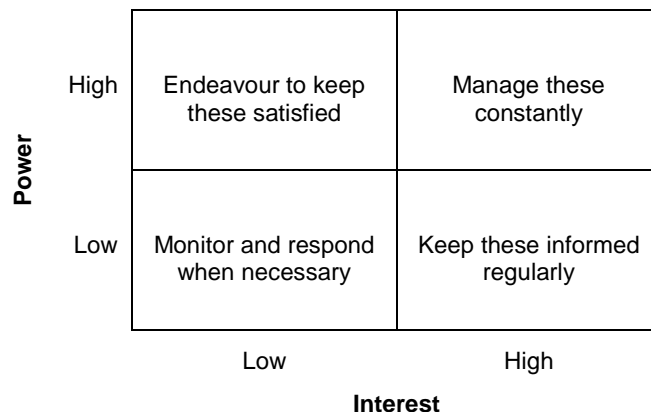


Figure 1: A power-interest grid for assessing stakeholders (Chinyio and Akintoye, 2008)

The management of stakeholders is usually underpinned by a number of paradigms. Amaeshi (2010) identifies three interrelated perspectives: the descriptive, instrumental and normative perspectives. The descriptive perspective, as the name suggests merely describes what the corporation is, and the interactions with its stakeholders. The instrumentalist perspective goes beyond mere description by looking at consequences of stakeholders (i.e. their relative influence) on the interests of the firm. Stakeholder management strategies arising from this perspective are usually driven by the firm's self-interest, characterised by a one-way, top-down communication, without any real voice being given to stakeholders. The normative perspective is underpinned by morality; that the engagement with stakeholders is the right thing to do. The premise is that: "the interests of all stakeholders are of intrinsic value [and] each group of stakeholders merits consideration for its own sake and not merely because of its ability to further the interests of some other group, such as the shareowners" (Amaeshi, 2010:16).

Smyth (2008) makes reference to utilitarian approaches to stakeholder management (similar to the instrumentalist perspective above), and proposes an 'ethics of care' approach (similar to the normative perspective that "provides an alternative moral philosophy based upon outcomes for managing stakeholders" (p. 634). He argues that since power carries responsibilities, it is not helpful to map interests of stakeholders against power; but rather, it is more ethical to map interests against responsibility. He therefore recommends that "stakeholder management theory needs to move away from approaches underpinned by skewed utility and from self-interested power-based analysis towards recognition of responsibilities for ethical care employing proactive management, [such as] ...relationship management" (Smyth, 2008:641).

It is acknowledged that because of the competing (and often contradictory) needs of stakeholders on a project, stakeholder management is more about managing expectations rather than achieving consensus. A first step to stakeholder management therefore involves the identification and assessment of the relative importance (prioritisation) of stakeholders on a project (Manowong and Ogunlana, 2010). This mapping is seen as an on-going process since the relative influence of a particular stakeholder can change over the lifecycle of a project (Newcombe, 2003; Chinyio and Akintoye, 2008). Depending on the type and importance of stakeholders, various levels of stakeholder management can be adopted. These include: informing, consulting, involving, partnering/collaborating, or a mixture of all of these (Manowong and Ogunlana, 2010). A range of approaches (or tactics) can also be adopted. Research by Chinyio and Akintoye (2008) on practical approaches adopted by some UK construction organisations identified, what they classify as, underlying approaches (e.g. developing a systematic way to engage with and manage stakeholders, providing top-level support, being proactive, maintaining existing relationships and responding to power-interest dynamics) and frontline approaches (e.g. effective communication, use of trade-offs, incentives, concessions, workshops, and various people skills). One of the conclusions from their research was that approaches for engaging with stakeholders need to be varied. This paper therefore introduces the Design Quality Indicator (DQI) and its potential for stakeholder management on construction projects.

3. The Design Quality Indicator (DQI)

The Design Quality Indicator (DQI) is “an assessment tool for evaluating the design quality of buildings” (Whyte and Gann, 2003:387). It was developed in the late 1990s (and launched in 2002) by the UK Construction Industry Council (CIC), as a counter to the dominance of process measurement in terms of Key Performance Indicators (KPIs) that did not consider building design quality (Gann et al; 2003; Odgers and Samuel, 2010) (There are separate DQIs for schools and healthcare buildings, launched in 2005 and 2012, respectively). The motivation for DQI stemmed from the realisation that good design has a positive contribution to the quality of people’s lives, and those who are affected by such designs should be involved in defining and assessing that quality (CABE, 2006). The DQI focuses on “engaging the whole stakeholder community in setting and assessing design priorities throughout the building process” (<http://www.dqi.org.uk>). It combines objectivity and subjectivity in assessing priorities, and thus sits in the middle between the judgement-based and rational (measurement) approaches to quality assessment (Gann and Whyte, 2003).

The definition of design quality adopted in the DQI is based on Vitruvius’s principles of *Utilitas* (Commodity), *Firmitas* (Firmness) and *Venustas* (Delight). The respective terms used are: **Functionality** (the way the building is designed to be useful), **Build Quality** (the construction and performance of the building), and **Impact** (‘wow’ factor; the building’s ability to create a sense of place and a positive effect on the local community and environment). Functionality is defined with respect to: *access, space, and uses*; Build Quality aspects are: *performance, engineering, and construction*; Impact with respect to: *urban and social integration, internal environment, form and materials, and character and innovation*.

The setting and assessment of design priorities is based on a standard set of questions (the DQI questionnaire – 99 questions for standard DQI, and 113 for DQI for Schools – DQIfS) under each of the quality areas (i.e. access, spaces, etc.) outlined above (e.g. “the building should provide good access for everyone;” “the building should be easy to operate”, “the building should be a pleasure to use”, etc.). The whole process involves a DQI Leader (somebody within the project team who champions the process), project stakeholders (users, clients, members of the design team, contractors, community members, etc.), and an independent DQI Facilitator (trained and approved by the CIC to run DQI workshops). There are four stages in the process: briefing, mid-design, ready for occupation, and in-use. During the briefing stage the key aspirations for the project are developed through discussion and consensus. Stakeholder views and priorities are recorded in the online DQI Briefing Record. Priorities are defined by assigning either ‘Required’, ‘Desired’, ‘Inspired’ or ‘Not Applicable’ to each of the statements on the DQI questionnaire. A ‘Required’ tag (e.g. against the statement: “the building should provide good access for everyone”) indicates that minimum standards and regulations will satisfy that aspiration. A “Desired” tag implies a design intervention beyond minimum standards (or where there are no defined minimum standards); an ‘Inspired’ tag implies a greater level of design innovation far beyond minimum standards (Table 1). A typical Briefing Record will have a greater proportion of ‘Required’ statements compared to ‘Desired’ and ‘Inspired’ statements. The graphical representation (line graph in Figure 1a) provides the basis for assessing the design and completed building in subsequent stages of the DQI process.

Table 1: The language of the DQI Tool (Source: <http://www.dqi.org.uk>)

	Required	Desired	Inspired	Not Applicable
Articulated by demand side	Compliance with standards, regulations and quantified minimum targets	Setting targets for building performance beyond the minimum required	Inspiring goals and standards. Reference to special buildings	<i>Because of the scope of the project, cannot be achieved</i>
Achieved by supply side	Working to accepted good design and construction practice	Integrated design solutions to practical matters	Imaginative synthesis of design strategies to create a special ambience and response of delight.	<i>Is not achievable</i>

During the mid-design, ready for occupation and in-use stages, the DQI assessment tool, which contains the same set of questions in the DQI questionnaire, but worded slightly differently (e.g. the statement on access mentioned above becomes: “the building provides good access for everyone”, in the assessment tool). Instead of ‘required’ (etc.) tags, each statement has a likert scale where respondents have to tick one of eight options (strongly disagree, disagree, tend to disagree, tend to agree, agree, strongly agree, not applicable, don’t know). The assessment can be done on paper or directly online, but all results have to be entered online to allow comparison with the briefing record. The scores of each respondent are aggregated and represented in various output graphs, illustrated in Figure 1. Table 2 contains the descriptions of each graph.

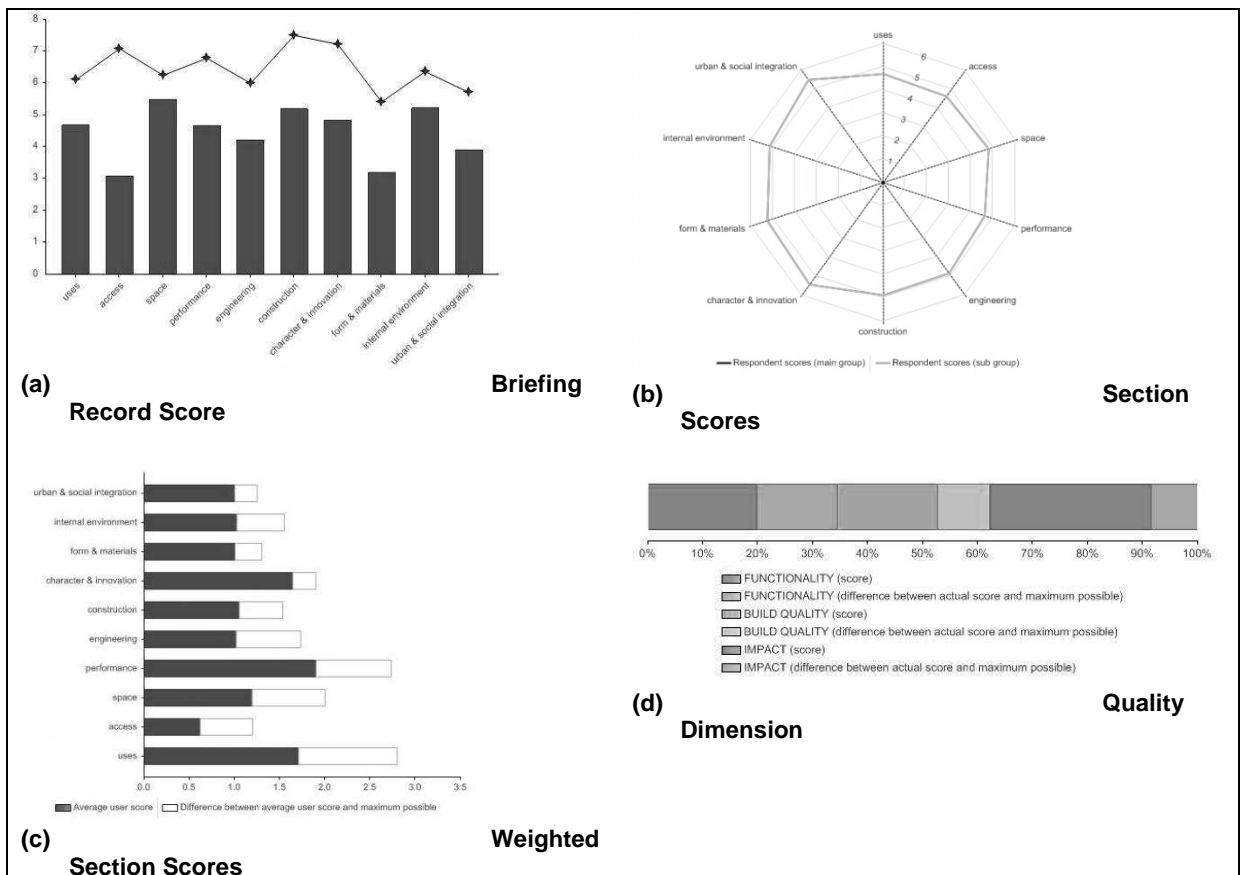


Figure 1: DQI Output Diagrams (source: <http://www.dqi.org.uk>)

Table 2: Description of DQI Output Diagrams

Diagram	Description
Briefing Record Output	This graph compares the results from the DQI assessment with the Briefing Record profile. The target line is the maximum the design can achieve. The bars display the results from the assessment and highlights how well the design has been judged to perform against the target. The height of the bar (i.e. how near or far it is from the target line) is a measure of how well that aspect of the design is meeting the target.
Section Scores	“This is a spider diagram scaled between 0 and 6. It displays the average of respondents’ answers to each section. The higher the score (the further out) the better the respondents felt the design was achieving that characteristic.”
Weighted Section Scores	“This graph shows the 10 sections of the main headings. It takes into account the weightings allocated to all the sections and the overall weightings and sets these against the individual responses made in each. This graph allows you to see what the most important sections are (overall length of the white line). The green line indicates how well the design is performing in each section.”
Quality Dimensions	“This graph illustrates the overall DQI and is scaled between 0 and 100%. It visualises two sets of results; firstly it takes into account the overall weightings allocated to Functionality, Build Quality and Impact, and secondly its sets these against the individual responses made to the statements within those three fields.”

Each stage of the DQI process is usually implemented via a workshop that is facilitated by the DQI Facilitator, in close collaboration with the DQI Leader, and can last from between 2hours to a full day, depending on the stage of assessment, number of participants and type of project. Increasingly the mid-design stage assessment has also been used as part of a bid-evaluation process.

4. Research Methodology

The objective of the research reported in this paper was to explore the role of the DQI tool in managing stakeholder requirements (the issue of design/project outcomes with respect to design quality was beyond the scope of what is being reported here). It is based on case material from DQI workshops for two projects. Given that the DQI process stipulates the involvement of a cross-section of project stakeholders, the key question was therefore around the perception of these participants on the relevance of the tool in enhancing their engagement with the project. The key source of data was therefore based on the standard feedback questionnaires completed by each participant at the end of a DQI workshop. The questionnaire asks participants to rate (from excellent, very good, satisfactory, unsatisfactory, poor) the appropriateness of the DQI tool, the format of the DQI session, and the quality of facilitation. Space is also provided for respondents to include qualitative comments on each section, and on the overall process. A description of the workshop process and the feedback scores and comments from two projects (A and B) (described in Table 3), are presented here. Some of the comments have been slightly altered to maintain anonymity and/or aid clarity, by the insertion of a [square bracket]. The outputs from each workshop, spread of stakeholders, and feedback scores will provide the basis for analysis. Lack of space prevents the inclusion of a wider variety of projects. However, the selected projects and type of stakeholders are relatively diverse enough to provide some insights into the process and its relevance in the management of stakeholder requirements on projects.

Table 3: Details of project cases

Project	Type	Brief Description	DQI Workshop	No. of Participants
A	A Fire and Rescue Authority, Private Finance Initiative project	The project involved the construction of 4 new community fire stations and a community life skills centre	Briefing Workshop (15 July 2008)	18
B	County Council Primary School	A replacement new-build primary school, to be built on the existing site of the school	Mid-Design Workshop (23 May 2011)	22

5. Findings from Cases

5.1. Project A: DQI Briefing Workshop

The objective of the workshop was to develop consensus among various stakeholders associated with the project, about their aspirations for the project, and to specify which aspects of the design are Required, Desired, or Inspired. The development of the Briefing Record and associated aspirations for the project was done in two stages. The first (pre-workshop) stage involved members of the project team and it was focused on scoring the briefing record (i.e. specifying which statements in the DQI questionnaire were Required, Desired or Inspired). The second (main workshop) stage involved discussions by representatives of various stakeholder groups around the key questions in the DQI questionnaire, and specific issues brought forward from the pre-workshop stage. The intention was to modify the briefing record developed in the pre-workshop stage following discussions in the main workshop, but this proved not to be necessary. The first half of the main workshop focused on assessing existing fire stations and included a tour of the [Project A] station (the venue for the workshop) (A formal assessment (as suggested in the DQI guide) was not conducted, due to time constraints, but the key questions in the DQI questionnaire were used to ‘assess’ existing facilities). The second half focused on defining aspirations for the new fire stations and life skills centre. The categories of stakeholders and a analysis of the feedback questionnaire, are provided in Tables 4 and 5, respectively.

Table 4: Stakeholders represented at DQI workshop (Project A)

Type	Local Residents	Fire-fighters	Other fire service staff	Project staff	Fire service union	Total
Number	5	5	5	2	1	18

The briefing record developed from the workshop showed that 59.6% (59) of the statements were considered to be *required*; 29.3% (29) were *desired*, and 11.1% (11) of the statements in the questionnaire would be *inspired* for the project. With respect to the statements within each section, 66.7% of Functionality statements were considered to be required; 76.3% of statements under Build Quality were considered to be required; and 35.3% of Impact statements were considered to be required. The key measures that would define the success of the project included the following:

- The need for community fire stations that are welcoming to their respective communities;

- Need for sufficient, fit-for-purpose spaces that are well planned and efficiently arranged, and fully dictated by the operations and activities of a community fire service
- Buildings that complement and are sympathetic to their immediate surroundings
- Need for robust ('fire-fighter proof) buildings that incorporate sustainable green solutions, future proof to prevent/minimise further development but adaptable to changing needs.

Table 5: Analysis of Feedback Questionnaire (Project A)

Ratings	Appropriateness of DQI Tool		Format of DQI Session		Quality of Facilitation	
Excellent	2	11.1%	1	5.9%	2	11.1%
Very Good	10	55.6%	11	64.7%	11	61.1%
Satisfactory	6	33.3%	5	29.4%	5	27.8%
Unsatisfactory						
Poor						
TOTAL	18	100%	17	100%	18	100%
Specific Comments	<p>Perhaps would have been useful for a short introduction of sites being considered</p> <p>Facilitated some interesting debate. Seemed to get everybody on board</p> <p>Not sure the exercise will produce the best results</p> <p>Enabled many views and points to be made</p> <p>It was a useful way to identify important needs</p> <p>A large number of varying views to be considered</p> <p>Briefing questionnaire provided a good basis to discuss any project to build</p> <p>Questionnaire good. Powerpoint slides confused some due to terminology</p> <p>Focus on key personal issues</p>		<p>Some sections after lunch would be better if shorter – more punchy (loosing concentration)</p> <p>Very unusual mix of participants who arrived [and] left throughout the workshop</p> <p>Not always clear about the point of the discussions – all ideas were important to the people who put them forward. Difficult to support vision from functionality</p> <p>Good variety of representation</p> <p>Works well but external stakeholders can find it difficult to engage in full process</p>		<p>Session had views from residents that I found useful</p> <p>Ideal to see operation and layout of fire station. Lecture room not ideal for event due to road noise, heat, lack of ventilation</p> <p>Not completely aware of the sensitivities of the location decisions</p> <p>Went over the same priorities in the morning and afternoon. I thought it unfair that priorities were recorded whilst most fire fighters were out on a shout</p> <p>DQI presentation was rushed</p>	
Any other (general) Comments	<p>After speaking to residents from [Site X], it would be interesting to hear issues from other residents on their thoughts on the station moving</p> <p>Important to continue process & involvement</p> <p>Very useful to hear and understand other stakeholders issues. I look forward to end result</p> <p>Very helpful I think hopefully!!</p> <p>Excellent refreshments. Friendly atmosphere.</p> <p>Glad to be involved – keep consultation going!</p> <p>Group discussion (6) very constructive, prior to this was probably more for other parties than myself</p> <p>I hope all the opinions expressed will be considered for the next stage of this process</p> <p>Good to listen to individual perspectives</p>					

5.2. Project B: DQI Mid-Design Workshop

The objective of the workshop was to assess the design for [Project B], against the aspirations for the project that were established at a previous Briefing Workshop (held in February 2011). The workshop started with a brief overview of DQIfS (DQI for Schools), a review of the key outputs from the Briefing Workshop, and an explanation on how the assessment questionnaire was to be completed. This was followed by a presentation on the design for the School with opportunities for questions from participants. After the presentation, participants completed the assessment questionnaire and then discussed positive and negative aspects of the design. The categories of stakeholders present are presented in Table 6.

Table 6: Stakeholders represented in DQI workshop (Project B)

Type of Stakeholder	Direct Users			Non-Users			Total
	Pupils	Teaching staff	Other staff (incl. Head Teacher)	Client	Governors	Design/ Project Team	
Number	7	3	5	1	3	3	22

The Briefing Record used as the basis for the assessment had been developed by a cross-section of (and is an aggregation of the views of) stakeholders. Given the number of questions on the DQIfS questionnaire (113), the seven (7) pupils (Table 6) who were present were asked to complete a selection of questions from the questionnaire (i.e. the key questions in the questionnaire and those statements that were prioritised as “inspired” in the Briefing Workshop). A “Don’t Know” response (a valid response) was put for all questions not answered to ensure that each pupil had enough responses for their scores to be included in the overall results; this did not affect the overall result.

A key question that provided the focus for this workshop was: “to what extent have ...aspirations for the project been addressed in the design?” The assessment scores showed that there was a very positive evaluation of the design. The key priorities set out at the Briefing Workshop focused mainly: space, ‘wood’ (materials), character and history (statements in the DQIfS questionnaire that were tagged as “inspired” also focused on space and “impact” issues; some “build quality” statements were also tagged as “inspired”). Space and “build quality” aspects were given high priorities during this workshop but “impact” aspects (e.g. “form and materials” and “character and innovation”) were considered to of low priority (relatively). There was therefore consistency between the priorities set at the Briefing and Design workshop for space and “build quality” aspects, but an apparent inconsistency in the priority of the “impact” aspects of the design. The inconsistency might be due to the fact that “impact” issues (e.g. character, wood) were not the real priorities of all participants. However, given the positive scores and overwhelming support for all aspects of the design, it was concluded then that the design for [Project B] that was presented during the workshop, closely matched the aspirations for the project, especially in those aspects (e.g. spaces) that were of priority to the majority of users. A summary of responses from the feedback questionnaire is provided in Table 7.

Table 7: Analysis of Feedback Questionnaires (Project B)

Ratings	Appropriateness of DQI Tool		Format of DQI Session		Quality of Facilitation	
	Excellent	3	13.6%	2	9%	6
Very Good	13	59.1%	18	82%	12	54.5%
Satisfactory	6	27.3%	1	4.5%	4	18.2%
Unsatisfactory			1	4.5%		
Poor						
TOTAL	22	100%	22	100%	22	100%
Specific Comments	Good discussions				Well organised and well-led by [XXXXXX]	
Any other (general) Comments	<p>I have enjoyed these sessions as [it's] important to share as much as possible of the new build with the community. Thank you for your work.</p> <p>A very good show</p> <p>It seems that the officers have taken note of the wishes and concerns of the staff, governors and children</p> <p>A very useful, enjoyable and relevant process for all participants involved. Thank you.</p> <p>A lot to cover in just 2 hours – session could benefit by being 2.5-3 hours duration</p>					

6. Discussion

Both workshops for Project A and B were successful in meeting the objectives of those workshops (i.e. developing a briefing record, and assessing the design for a project). In Project A, all respondents rated as satisfactory (or better) the appropriateness of the DQI tool (66.7% rated it as very good or excellent), the format of the session (70.6% rated it as very good or excellent), and the quality of facilitation (72.2% rated it as very good or excellent). The satisfaction levels are also comparable in Project B, where 21 out of the 22 participants who completed the feedback questionnaire rated as 'satisfactory' (or better) the appropriateness of the DQI tool (72.7% rated this as very good or excellent), the format of the DQI session (91% rated this as very good or excellent), and the quality of facilitation (81.8% rated this as very good or excellent); only 1 respondent (a pupil) rated the format of the DQI session as "unsatisfactory". The qualitative comments (Tables 5 and 7) were also generally very positive, although there were a few negative comments (e.g. lecture room not ideal, not being clear about discussions/confusing PowerPoint slides – Table 5). However, comments like: "briefing questionnaire provided a good basis to discuss any project build"; "very useful to hear and understand other stakeholders' issues..." (Table 5); "it seems that the officers have taken note of the wishes and concerns of the staff, governors and children" (Table 7), suggest that participants felt this was a good way to engage stakeholder views.

The evidence from the two cases presented therefore suggests that the DQI tool does indeed enhance engagement with stakeholders. However it should be noted that the use of the DQI tool is not the only stakeholder engagement activity that takes place. There are several other interactions between the project team and stakeholders, although this tends to be organised with individual stakeholder groups. The DQI thus provides an avenue for engagement with a cross-section of stakeholders. Also, the success of a DQI workshop

largely depends on the skills of the facilitator and the willingness (and ability) of the DQI Leader to involve as wide a cross-section of stakeholders as possible (i.e. to adopt the normative perspective or 'ethics of care' approach described by Amaeshi, 2010 and Smyth 2008, respectively). One of the comments in Table 5 ("I thought it was unfair that priorities were recorded whilst most fire fighters were out on a shout") referred to a point in the workshop when a number of fire-fighters who were on call, had to leave the workshop to respond to an emergency. The DQI Leader was unable to get station managers to send only participants who were off duty. It needs to be pointed also that the DQI process doesn't involve the identification and mapping of stakeholders (Manowong and Ogunlana, 2010), and therefore does not cover all aspects of stakeholder management.

7. Conclusion

This paper has explored the role of the Design Quality Indicator (DQI) tool in the management of stakeholder requirements in construction projects. The outputs and feedback comments from two cases (DQI workshops for specific projects) were used to explore the potential of the tool in stakeholder requirements management. It is observed that while the DQI does not cover every aspect of stakeholder management, it thus provide a good avenue for aggregating the views of stakeholders around the crucial issue of building design quality, and in providing a robust baseline (briefing record) for subsequent assessment of the design and building. The successful use of the tool however, appears to depend on the quality of facilitation and the willingness of project leaders to genuinely engage with stakeholders. The genuineness of engagement applies to all approaches to stakeholder management, and is not unique to the DQI. A final point to note is that the usefulness of the DQI (as presented from the cases above) was not assessed against other approaches; as the aim was not to compare the DQI against other methods. Further research is clearly required to establish this. The paper also did not address the issue of final design/project quality outcomes (as it was focused on stakeholder engagement); further research is therefore required to determine the measurable benefits on the use of DQI, and the contribution of stakeholder engagement in enhancing building design quality. The DQI however, thus have a role in the management of stakeholder requirements and expectations on construction projects.

References

1. Amaeshi K (2010) "Stakeholder management: theoretical perspectives and implications," in Chinyio, E. and Olomolaiye, P. (eds.), *Construction Stakeholder Management*, Wiley-Blackwell, Oxford, pp. 13-40
2. Atkin, B. and Skitmore, M. (2008), "Editorial: stakeholder management in construction," *Construction Management and Economics*, **26**(6): 549-552.
3. Commission for Architecture and the Built Environment (CABE) (2006) *Buildings and Spaces: Why Design Matters*, London, CABE (available online at <http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/publications/buildings-and-spaces>, accessed November, 2012)

4. Chinyio, E. and Olomolaiye, P. (2010), "Introducing Stakeholder Management" in Chinyio, E. and Olomolaiye, P. (eds.), *Construction Stakeholder Management*, Oxford, Wiley-Blackwell, pp. 1-12.
5. Chinyio, E. A. and Akintoye, A. (2008), "Practical approaches for engaging stakeholders: findings from the UK," *Construction Management and Economics*, **26**(6): 591-599.
6. Gann, D. M. and Whyte, J. K. (2003), "Design quality, its measurement and management in the built environment," *Building Research and Information*, **31**(5):314-317.
7. Gann, D. M., Salter, A. J. and Whyte, J. K. (2003), "Design quality indicator as a tool for thinking," *Building Research and Information*, **31**(5): 318-333.
8. Kamara, J. M., Anumba, C. J. and Evbuomwan, N. F. O. (2002) *Capturing Client Requirements in Construction Projects*, London, Thomas Telford.
9. Leung, M. and Olomolaiye, P (2010), "Risk and construction stakeholder management," in in Chinyio, E. and Olomolaiye, P. (eds.), *Construction Stakeholder Management*, Oxford, Wiley-Blackwell, pp. 75-98.
10. Manowong, E. and Ogunlana, S. (2010), "Strategies and tactics for managing construction stakeholders," in in Chinyio, E. and Olomolaiye, P. (eds.), *Construction Stakeholder Management*, Oxford, Wiley-Blackwell, pp. 121-137.
11. Newcombe, R. (2003); "From client to project stakeholders: a stakeholder mapping approach," *Construction Management and Economics*, **29**(5): 433-434.
12. Olander, S. (2007), "Stakeholder impact analysis in construction project management," *Construction Management and Economics*, **25**(3): 277-287.
13. Odgers, J. and Samuel, F. (2010) "Designing in quality," in Dutoit, A., Odgers, J. and Sharr, A. (eds), *Quality Out of Control: Standards for Measuring Architecture*, Abingdon, Routledge, 41-54.
14. Smyth, H. (2008), "The credibility gap in stakeholder management: ethics and evidence of relationship management," *Construction Management and Economics*, **26**, 633-643.
15. Van Gunsteren, L. A. (2011), *Stakeholder-oriented Project Management Tools and Concepts*, IOS Press, Amsterdam
16. Whyte, J. K. and Gann, D. M. (2003), "Design quality indicators: work in progress", *Building Research and Information*, **31**(5): 387-398.