USER GROUP CONSULTATION: DESIGN QUALITY AND PROJECT SUCCESS

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Keywords

interdisciplinary design, hospital, design quality, academic research, project success,

survey, user group consultation

Executive Summary of Key Concepts

User group consultation is required for the design of publicly funded healthcare facilities in Australia and New Zealand. This process is often frustrating and tends to be expensive and time consuming, yet its effectiveness in improving both design quality and the satisfaction of user group participants is untested and ways to improve it are rarely investigated. Participative design processes are more effective and efficient when healthcare user groups, project clients and design teams work towards the same goals and objectives that include the quality of the design and what constitutes a successful project. An online survey was used to test how user group participants define and rank "design quality" and "project success" as key goals and objectives for a healthcare design project. These terms reflect the interests of healthcare designers and their project clients, and their perceptions of these concepts were compared with those expressed by clinicians and other "users" working in a health facility. Healthcare designers should take the lead in working with their project clients and user groups to clearly define a project vision that addresses "design quality", "project success" and the connection between them.

Abstract

1. Aim

User group consultation is more effective when participants work towards commonly agreed goals and objectives. To understand how they set these goals, this research explored how "user group" participants from diverse professional discipline backgrounds define the concepts of "design quality" and "project success", and their connection on a healthcare facility design project.

2. Background

User group consultation is often time consuming, frustrating, and expensive. Rarely are "design quality" or "project success" clearly defined, nor is the connection between them communicated well either in the literature, or by project clients.

3. Methods

Using an online survey, respondents were asked to rank frameworks of components for design quality and project success in order of importance, and to indicate how they believed their project clients would assess the same components. They were asked about the connection between the terms, and how well each was achieved on their healthcare projects, both from their personal and their client's point of view.

4. Results

Design quality and project success were personally valued highly by respondents, with a strong connection seen between the concepts. By contrast, respondents perceived their clients saw the connection as less important. Functionality was essential to all, especially clinicians, but designers and other consultants demonstrated a broader perspective on all design outcomes.

5. Conclusions

Healthcare designers should take the lead on project teams in defining "design

quality" and its connection to "project success" as part of setting clear goals and objectives

for more effective user group consultation.

This research is part of a larger study that investigated how participants assessed the goals and objectives, process, and outcomes of the collaborative user group consultation process commonly used on Australia and New Zealand healthcare projects. Most of these projects are publicly-funded and government-run, and all citizens can access them without the need for additional (private) health insurance. "Users" are defined as those who will "use" or work in a healthcare facility, and included clinicians (doctors, nurses, allied health), managers (e.g., facility, district, general), and other employees such as maintenance and other operational staff who had been involved in a user group design process. Patients, their families and members of the wider community are also considered to be "users", but due to ethics approval processes in the Australian and New Zealand health systems, were not involved in the research but could be consulted in future research studies. As participants in the user group process, consultants such as designers (e.g., architectural, interior, landscape, wayfinding, engineers), project directors / managers, and client representatives were also invited to take part in the research. Although not specifically defined, respondents were encouraged to interpret the terms "project client" and "project funding body" as appropriate to their project or workplace situation.

One of the most important strategies for conducting a successful participatory design process, in this case the user group process for a healthcare project, is the definition and documentation of a clear vision, and the agreed goals and objectives for the project (Elf, Frost, Lindahl, & Wijk, 2015; Hamilton, 2016; Stichler, 2009). This research investigates 1) how well the goals and objectives of the consultant design team and users (expressed as "design quality") mesh or overlap with those of the overall project team and 2) assists them to achieve a successful project (expressed as "project success"). It sought the personal perspective of each user, and their views regarding whether they felt that their project client or funding body saw the issues in the same way.

Significance / Aim / Purpose

Participative design processes are more effective and efficient when healthcare user groups, project clients and design teams work towards the same goals and objectives and these include the definition of design quality and how it contributes to a successful project. Healthcare designers as "design experts" work with healthcare user group members who are the "functionality experts", plus other team members, and their project clients. Together they must define and agree "design quality" and "project success" as goals for each healthcare project on which they collaborate. This includes how these concepts relate to each other, and how they will be assessed. This will assist achieving project outcomes, and ensure that lessons learnt can be translated to future projects.

Review of the Literature

The Value of Interprofessional Collaboration

Successful user group consultation for a healthcare project requires effective interprofessional teamwork, and good communication between all parties. The best results are achieved when participants understand each other while working towards common goals and objectives, and this relies on achieving effective clinician input (Keys, Silverman, & Evans, 2016). Understanding the professional roles and responsibilities of other team members is important, and a common language must be developed that crosses professional discipline boundaries, and minimizes misunderstandings and mis-communications. This will ensure the accurate translation of thoughts and ideas between participants (Reno et al., 2014; Suter et al., 2009). This will also support the setting of goals for "design quality" and "project success", and defining how they are related to each other.

Participatory Design

The healthcare sector has specific characteristics that include the direct involvement of many clinicians as users in the design process, but notwithstanding this, can also learn

lessons from participatory design processes utilized in other sectors. User group consultation is part of a continuum of participatory design tools and techniques that have been used in many other sectors such as urban planning, community housing and workplace design in locations including the United States (US), United Kingdom (UK), and Europe (Luck, 2003). "Participatory design", also known as "community participation" or "co-design", has been written about extensively by authors such as Henry Sanoff and Rachael Luck (Luck, 2007; Sanoff, 1979, 1985, 1990). Blundell Jones, Petrescu, and Till (2005, p. xiii) noted that "architectural participation can be defined as the involvement of the user at some stage in the design process", and that due to the multiplicity of users from different backgrounds and with differing agendas, multiple forms and methods encouraging participation will be necessary. This supports the claim of Reno et al. (2014) that it is necessary to create a shared language and understanding between members of multi-disciplinary teams as they evolve and take part in the planning process. Similarly, it confirms the warning of Hamilton (2010, p. 20) that authoritarian decision models may result in the making of poor decisions based on incorrect assumptions, whereas a collaborative decision style can utilize situation-specific expertise available from a greater range of team members. In summary, collaborative and participatory design processes can add a broader perspective, greater experience and expertise, and hence, increased value to the healthcare facility design process.

Setting Goals and Objectives for the User Group Process

   Project vision, goals and objectives. Effective user group collaboration for a healthcare facility requires the development of a shared project vision, expressed as common goals and objectives, and these include setting the goals for, and relationship between "design quality" and "project success" on every project. Stichler (2009, p. 305) notes that "nearly all projects have issues, concerns, values, and beliefs that become a framework to guide design priorities and decisions on the project". These will support the project team in making project-related

decisions, and also provide the metrics and research methodologies for assessing the success of a healthcare project as part of a Post Occupancy Evaluation (Reno et al., 2014; Stichler, 2016).

Defining design quality. Whether the leader of the design team, or under the direction of another, a healthcare architect must work with user group members to balance many issues. These include the project client's time program and budget, the delivery of health services in accordance with an agreed health service plan, compliance with standards and guidelines, use of evidence-based design, creation of a patient-focused and healing environment, and accreditation processes. It also requires acknowledging the clinicians' preferred methods of working, hierarchies and collaborations, and taking into account environmental sustainability goals, site, physical, social, and political constraints (Hamilton, 2016). Viewing participatory design as a "social process" means that the designer is only one player in the process and that "the people who are commonly known as the 'users' are active participants in the design process" (Luck, 2003, pp. 523-524).

The healthcare designer, in conjunction with a project team, must define a framework of essential (and desirable) qualities that a healthcare project will be expected to achieve. For the purposes of this research, these are identified and designated as the "design quality" goals for a project. Often, compromises must be made, and although this is often not easy or straightforward, for every project, the concept of "design quality" must be "constructed". It must then be agreed with every user group member, and endorsed by the project client. This is necessary to guide the work of the designers and other expert consultants on the project team.

Defining and assessing "design quality" as a standalone concept is difficult, and it is far easier to draw from the many assessment methodologies specifically tailored for healthcare buildings. Despite the specialized nature of healthcare buildings, most healthcare

building assessment tools continue to be built on the Vitruvian tradition. Vitruvius was a Roman architect who wrote extensively on the desirable qualities of public buildings, and grouped desirable design qualities under the headings of "firmness, commodity, and delight", or variations of these terms (Vitruvius, 1999). These have been adopted as a solid foundation to contemporary tools focusing solely on the design quality of hospitals that continue to do this (Cook, 2008; Gann & Whyte, 2003). In the UK, development of design assessment toolkits culminated in The Achieving Excellence Design Evaluation Tool (AEDET), produced for hospitals by the UK National Health Service (NHS). This was ultimately superseded by the Design Quality Indicators (DQI) for Health Guidance, that groups its assessment criteria in a similar "Vitruvian" manner (Construction Industry Council, 2016; Prasad, 2004).

In developing a Canadian Building Performance Methodology as a Balanced Scorecard approach to facility evaluation, Steinke et al. (2010) reviewed the portfolio of internationally developed building evaluation tools such as DQI, AEDET, Building Research Establishment Environmental Assessment Method (BREEAM), Comprehensive Assessment System for Built Environment Efficiency (CASBEE), Indoor Environmental Quality (IEQ) and Green Building Tool (GBTool). She proposed four performance dimensions: service, functional, physical, and financial. Aesthetics, beauty, or fit with the urban or cultural environment (Vitruvian "impact"), are absent from this evaluation framework, yet could be added to the "physical" dimension. From a similar perspective, Anåker, Heylighen, Nordin, and Elf (2016) reviewed design quality literature in order to "develop a clear conceptual framework to enable communication and operationalization of what good design stands for and how it can contribute to results in healthcare, rather than relying solely on subjective values about quality" (2016, p. 137). Aesthetics is mentioned only once with a passing reference to Vitruvius, and beauty and responsiveness to a facility's site or external

environment are accorded little importance in comparison to fitness for purpose or functionality.

Defining project success. Like "design quality", "project success" is also difficult to define as a standalone concept, and is best defined by the methods used to assess it. Increasingly, healthcare facilities are judged in terms of their contribution to a project client's organizational goals and objectives as reflected in the Balance Scorecard evaluation method (Steinke et al., 2010), and a methodology for assessing the overall success of a project as outlined by Hamilton (2016). Project success has evolved from the traditional "iron triangle" of time, cost, and scope of the 1950s to 1980s to focus on a wider set of Critical Success Factors (CSF), advocated by Atkinson (1999) and others. These have broadened from an emphasis on project implementation to include more subjective criteria and the wider involvement of project stakeholders (Baccarini, 1999).

To identify how thinking and research about project success has evolved, Müller and Jugdev (2012) reviewed project management literature from the 1980's into the second decade of the 21st century. Pinto, Slevin, and Prescott were among the first to move beyond the definition of project success as conformance with time, budget and performance, to include the qualities of being technically correct, and producing an outcome in accordance with the client organization's requirements and objectives (Pinto & Prescott, 1988; Pinto & Slevin, 1987, 1988). Shenhar et al. (2001), broadened the concept of project success to include other dimensions such as achieving the organizational and business goals of the client organization, defining four dimensions for success: project efficiency, impact on the customer, business success, and preparing for the future.

In a 2015 study, American facility owners/clients were asked how successful healthcare infrastructure could be ensured. The study report commented that the owner is the most important stakeholder in terms of shaping a project, yet "most owners don't effectively

exert the project controls available to them" (Hamilton, 2016, p. 4). It outlined a successful project process, and by inference, the outcomes necessary for project success. Definitions of these outcomes varied by organization, generally extended beyond the traditional parameters of time and cost, and suggested that "real success may more often be related to delivery of the desired scope at the desired quality level" (Hamilton, 2016, p. 4). The outcomes reinforce the essentially social and "situated" nature of participatory design processes, i.e., for the purposes of this research, user group consultation for healthcare buildings (Luck, 2003, 2018). In order to realistically assess the success of a project, more interpretivist research may also be required to balance the post positivist and realist research that largely prevails in the project management community, and may necessitate "our acceptance of different world views in terms of conducting research on project success" (Müller & Jugdev, 2012, p. 769). These different worldviews are reflected when ranking in terms of importance, the components of "project success".

The connection between design quality and project success. Most evaluation frameworks omit the social dimension from design quality assessment, including the link between "design quality" and "project success" that derives from a rarely acknowledged "combination of organizational cultures, management strategies and social norms and practices brought to the user group forum by each participant" as noted by Watson, Evans, Karvonen, and Whitley (2016, p. 510). Similarly, the success of a project may depend on delivering the required design scope and quality in accordance with an agreed time program and budget (Hamilton, 2016). This is the place where the concepts of design quality and project success overlap. This research explores this overlap, and other possible connections, to support healthcare designers in setting goals and objectives for "design quality" and "project success" more effectively when working with healthcare user groups.

Method

Survey research

An online survey was used to gather data quickly and broadly, and also to triangulate research data that will be gathered by means of interviews in the next stage of the research (Groat & Wang, 2002). Questions were developed in the software program Key Survey, and Ethics approval was granted by Queensland Institute of Technology (QUT) no.1700000155. Respondents provided informed consent by proceeding past the information page and completing the first question. Questions were both closed, and open-ended with commentary invited in response to each section of the survey. To ensure a suitable spread of respondents, the survey gathered demographic information regarding respondents' geographic location, professional background, project role, and healthcare design experience. To continue past this point, all respondents were required to have participated in a user group process for a healthcare facility within the last five years in order to demonstrate recent, relevant experience on healthcare projects. The next part of the survey focused on the satisfaction of participants with the user group process as implemented on their most recent project or projects, and is the subject of another paper (in press). This paper reports the results from the final part of the survey that investigated the priorities, goals and objectives of user group members for their healthcare projects, and how well they were achieved. For the purposes of this research, and to assist in communicating the goals to survey respondents, these were summarized as achieving 1) "design quality", and 2) "project success" for a healthcare project.

Design quality measures, whether assessing the application of evidence-based design (EBD) principles, evaluating design pre-construction, or undertaking post occupancy evaluation tend to converge (Codinhoto, Platten, Tzortzopoulos, & Kagioglou, 2010; Durmisevic & Ciftcioglu, 2010; Preiser et al., 2001; Shepley & Watson, 2013). These

measures usually focus on Functionality, Build Quality, and Impact, or variations of these Vitruvian terms. Hence, given how well these terms appear to be understood and accepted by design practitioners, researchers and project clients, they are used as the framework for design quality components as presented to survey respondents. Similarly, drawing on and distilling the criteria discussed in the literature, and again recognizing their ready acceptance by practitioners and healthcare clients, a framework of project success components that focused on performance (project efficiency), product (project effectiveness) and process (implementation success) was also presented to survey respondents. Both frameworks were developed, tested and amended with the input of peer researchers prior to incorporation in the survey. The survey also investigated the ranking of the components of these two concepts in terms of their importance to user group participants, and how users understood and assessed the connection between these terms as an outcome of user group consultation.

Selection of Respondents

The survey was distributed anonymously to a range of user group participants by: Australian and New Zealand health authorities including Health Infrastructure NSW, the Victorian Department of Health and Human Services, Queensland Health, Canterbury and Southern District Health Boards; professional organizations such as the Australian Institute of Architects, Australasian College of Health Service Management, and Australian and New Zealand Health Design Councils; and by several large architectural and project management consultancy firms. These bodies were selected because they target a large number, if not the majority, of user group participants, managers, design and other specialist consultants who participate in the design of healthcare facilities in Australian and New Zealand.

The survey was open for a period of fourteen weeks, started by 107 people and fully completed by 68. Ninety-five respondents (89%) were qualified to proceed with the survey as they had recent experience (within the last five years) on healthcare projects. However, 28

(30%) then dropped out progressively giving a completion rate of 72% for all qualified

respondents suggesting that some of these respondents may have intended to return to

complete the survey at a later date, but never did so.

The main workplaces for respondents were Australia (66, 64%) or New Zealand (34,

33%), with the remainder from Singapore (2 or 2%) or another country. The top three

occupational groups of respondents were 1) Designers (26, 27.4%), 2) Project Manager /

Project Director (20, 21.1%) and 3) Clinician (18, 18.9%). The remaining thirty-one

respondents were a mix of facility (4, 4.2%) and general managers (15, 15.8%),

service/health planners and other specialist consultants. Therefore, in terms of the definition

of "users" as noted earlier, there were 37 "users" i.e., forming 38.9% of all respondents who

completed some or all of the survey.

Design Quality and Project Success

Tables 1 and 2 show the frameworks of components and sub-components for "design

quality" and "project success", respectively, as presented to survey respondents.

Table 1:
Proposed Design Quality Assessment Framework for hospitals and healthcare buildings

Dimension	Component		
Functionality	**Access** • Internal relationships to other units/services in the building, or on the hospital campus; • External relationships to other units/ buildings/services outside the hospital campus; • Location on the hospital campus; • Wayfinding for different	**Use** • "Fit for purpose"; • Supports health service delivery; • Good workplace for staff; • Appropriate environment for patient care - "patient focused", supports healing, privacy, and dignity; • Equipment –	**Space** • Size, proportions of rooms/spaces; • Layout, relationship between spaces within the unit.

	groups of users – patients, visitors, staff, others; • Access pathways for visitors, patients, staff, logistics.	quantity, quality; • Flexible; • Adaptable; • "Future proofed".	
Build Quality	**Performance** • Adequate illumination; • Air quality and freshness; • Availability of daylight; • Cleanliness and ease of maintenance; • Infection control; • Workplace Health and Safety (e.g., OHS, WHS); • Noise control; • Thermal comfort; • Operational costs minimized e.g., water use, energy, etc. • Environmentally sustainable design (ESD) – e.g., Greenstar Rated.	**Engineering Systems Design** • Lighting – natural, artificial; • Ventilation – natural, artificial; • Air-conditioning; • Electrical systems; • Security; • Acoustics; • Hydraulics; • Medical Gases.	**Construction** • Durability; • Detail solutions; • Code compliance; • Structural design; • Finishes; • Structural material selection.
Impact	**Urban and Social Integration** • Image e.g., size, shape and form are appropriate to urban context. **Character and Innovation** • Identity; • Iconic; • Originality; • Award-winning - architecture / construction.	**Internal Environment** • Internal spaces; • Outlook; • Furniture layout; • Aesthetics e.g., interior color scheme, materials and finishes, fit-out; • Artwork; • Indoor plants and landscaping.	**Form and Materials** • External form; • Colors; • Textures; • Materials.

Table 2
Proposed Project Success Assessment Framework for hospitals and healthcare buildings

Dimension	Component		
Performance **[Project Efficiency]**	**Quality** • Meets or exceeds desired quality level	**Time** • On time or earlier **Scope** • Fulfils or exceeds the intended scope.	**Cost** • On or within budget

Product
 	
[Project
 	
Effectiveness]
	Vision and Purpose
	• Aligns with organization's strategic vision;
	• Project achieves its purpose;
	• Supports ongoing work of client organization;
	• Satisfies shareholders.
		Stakeholder Satisfaction
		• Meets or exceeds the needs and aspirations of key stakeholders.
		
		Customer/client
		Satisfaction
		• Outcomes-based, including:
		
		  - Shorter lengths of stay;
		  - No hospital acquired infections;
		  - No workplace injuries;
		  - Higher patient satisfaction scores;
		• Provides "transformative experiences" for patients, families, clinicians and other staff
			Meets User
			Requirements
			• Enhances work flow efficiency.
			• End-user satisfaction.
			
			Business-related Goals
			• Allows for the provision of the highest quality of care at an affordable price;
			• Operates at the lowest total cost of ownership;
			• Flexible and adaptable to future changes in technology and care delivery models.

Process **[Implementation**	**Resources** • Efficient use of available resources	**Building Contractor** • Profitability for the building contractor	**Political and Social Goals** • Achieve project-specific political or

Success]			social factors
	Professional Image of Client • Effect on the professional image of the client organization **Growth and Development** • Personal growth and development for project participants • Change management	**Environmental Issues** • Impact on the environment • Sustainability	**Working Relationships** • Good working relationships for contracting partners **Quality Improvement** • Learning opportunities for client organization

Survey respondents were asked to rank the components and sub-components within each of the two frameworks in terms of their importance to achieving the nominated goal, i.e., "design quality" or "project success". First, they were asked their personal opinion, and then to indicate how they believed that their project clients ranked the same components. Next, they were asked to indicate the degree to which they personally believed that the components were achieved on their most recent healthcare project/s, and how they felt that their project client assessed the same issues. They were then able to indicate both quantitatively, and via open-ended commentary, their perception of the importance of the connection between the two goals i.e., "design quality" and "project success", and then their opinion regarding how their project clients felt about the same connection. Finally, they were asked to provide any additional comments regarding how "design quality" and "project success" are connected for a healthcare project. See table 3 for a summary of the questions asked and the rating scales that were available to respondents. Generally, these were Likert-type scales with seven steps.

Table 3

Survey questions relating to "design quality" and "project success"

Note: for Assessment Frameworks, refer to tables 1 and 2.

C. Design Quality:

The "design quality" of a healthcare building is often evaluated in terms of its functionality, build quality and impact. The table below illustrates how these dimensions are related to criteria for assessment.

[see Table 2 - Assessment Framework for "design quality"]

C.1 Please rate the following objectives in terms of how important you PERSONALLY believe them to be in achieving "design quality" for a health building

Rating scale used:

A Unimportant	B	C	D Neutral	E	F	G Important

C.2 As a result of your most recent experience with "user group" consultation, to what extent do you believe that the process achieves "design quality" for a healthcare building - as you PERSONALLY define it?

Rating scale used:

Very well
Well
Adequately
Poorly
Very poorly
Don't know
Please add any comments re your response...

C.3 Please rate the following objectives in terms of how important you believe they are to PROJECT CLIENTS OR FUNDING BODIES in achieving "design quality" for a health building.

Rating scale used:

A Unimportant	B	C	D Neutral	E	F	G Important

C.4 As a result of your most recent experience with "design quality" consultation, to what extent do you believe the process achieves "design quality" for a healthcare building - as defined by PROJECT CLIENTS OR FUNDING BODIES?

Rating scale used:

Very well
Well
Adequately
Poorly
Very poorly
Don't know
Please add any comments re your response...

C.5 Please note below any other reflections or thoughts you have regarding "design quality" and how to achieve it for a healthcare project.

D. Project Success:

"Project Success" for a healthcare project is often evaluated in terms of Performance, Product and Process. The table below illustrates how these dimensions are related to criteria for assessment.

[see Table 3: Assessment Framework for "project success"]

D.1 Please rate the following objectives in terms of their importance to your PERSONAL DEFINITION of "project success" for a healthcare building project.

Rating scale used:

A Unimportant	B	C	D Neutral	E	F	G Important

D.2 As a result of your most recent experience with "user group" consultation, to what extent to you believe the process achieves "project success" for a healthcare project as you PERSONALLY define it?

Rating scale used:

Very well
Well
Adequately
Poorly
Very poorly
Don't know
Please add any comments re your response...

D.3 Please rate the following objectives in terms of how important you believe they are to PROJECT CLIENTS OR FUNDING BODIES in achieving "project success" for a healthcare building project.

Rating scale used:

A Unimportant	B	C	D Neutral	E	F	G Important

D.4 As a result of your most recent experience with "user group" consultation, to what extent to you believe the process achieves "project success" for a healthcare project as defined by PROJECT CLIENTS AND FUNDING BODIES?

Rating scale used:

Very well
Well
Adequately
Poorly
Very poorly
Don't know
Please add any comments re your response...

D.5 Please note below any other reflections or thoughts you have regarding "project success" and how to achieve it for a healthcare building project.

E. The Connection between "Design Quality" and "Project Success":
Project clients or funding bodies rarely explicitly discuss or measure the relationship between "design quality" and "project success" for a healthcare project. Defining these terms and their inter-relationships is complex and depends on the point of view of the person considering them. The next questions ask how you view the connection between these concepts.

E.1 As a result of your most recent experience with "user group" consultation, and IN TERMS OF THE DEFINITION OF EACH BY PROJECT CLIENTS OR FUNDING BODIES (AS EXPLORED EARLIER IN THIS SURVEY), how well do project clients and funding bodies communicate that there is a connection between "design quality" and "project success" for a healthcare project?

Rating scale used:

Very well
Well
Adequately
Poorly
Very poorly
Don't know
Please add any comments re your response...

E.2 As a result of your most recent experience with "user group" consultation, and IN TERMS OF YOUR PERSONAL DEFINITIONS OF EACH (AS EXPLORED EARLIER IN THIS SURVEY), how strongly do you believe that there is a connection between "design quality" and "project success" for a healthcare project?

Rating scale used:

Very well
Well
Adequately
Poorly
Very poorly
Don't know
Please add any comments re your response...

E.3 Please provide any additional comments regarding the connection between "design quality" and "project success" for a healthcare project.

Analysis of results

Quantitative results were analyzed using MS Excel with the results reviewed by clinician, managerial and designer colleagues, and then presented graphically. Qualitative commentary was analyzed for key themes using nVivo, then exported for further analysis into MS Excel and MS Word. Following discussion with clinician, managerial and designer colleagues, the results and conclusions were reviewed and summarized.

Findings

Experience on Healthcare Projects

Designers demonstrated the most experience on healthcare projects, and were nearly half (25, 49%) of the respondents with eleven years or more experience. Project Managers/Project Directors were the next most experienced with (9, 17%) having a similar level of experience. Clinicians had the least experience on healthcare design projects with (13, 73%) having five years or less experience, compared to no Designers in this category.

Design Quality Criteria

When asked to assess the importance of the design quality criteria, all respondents personally scored "Functionality" criteria more highly than "Build Quality", and "Impact". The lowest scores were given to "Impact – Urban and Social Integration", "Impact - Form and Materials", and "Impact – Character and Innovation". All respondents believed that they valued all components more highly than their project clients. In particular, the "Impact" components were felt to be more important to them personally than to their project clients or funding bodies. See figure 1 below.
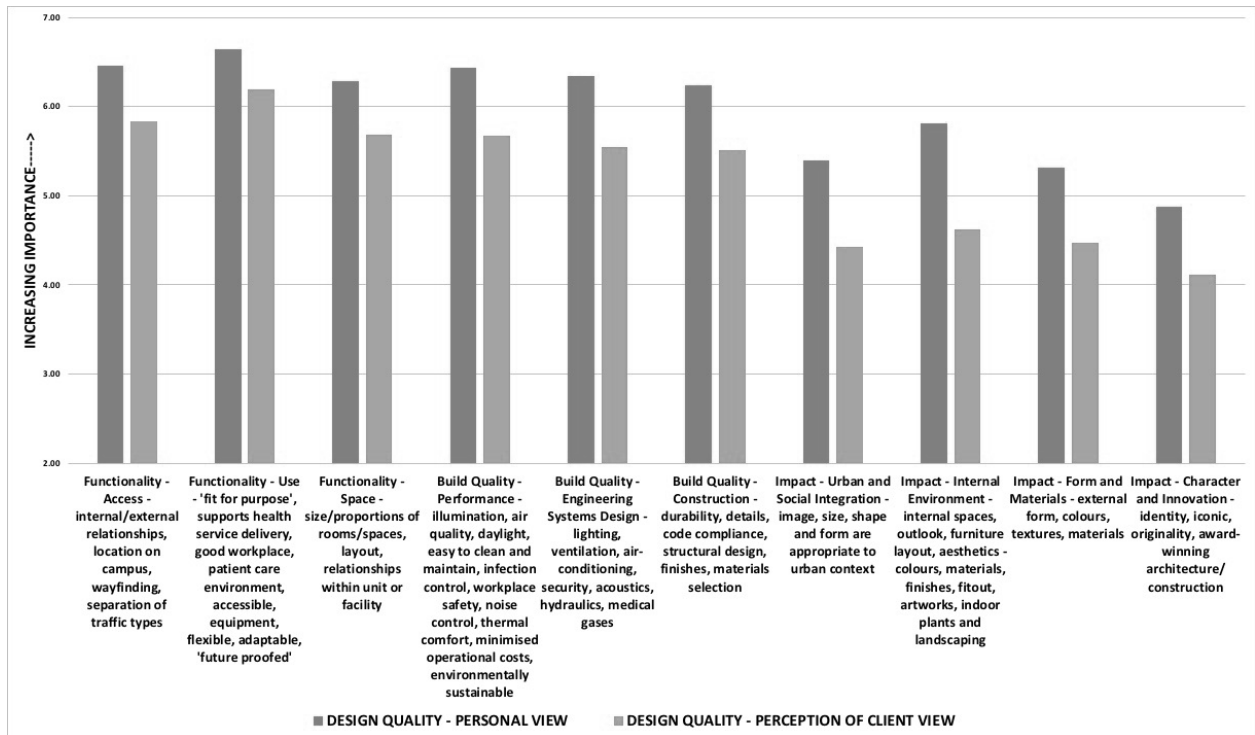
Figure 1: Assessment of design quality attributes - personal view and perception of client view : all respondents

Generally, clinicians regarded design quality as less important than designers. Designers ranked all design dimensions and components either equal to, or higher than the average for all the respondents. However, except for "Functionality – Space", clinicians ranked all the design components as either equal to, or lower than the average. Designers' and clinicians' perceptions of their project client/funding body views regarding the importance of the design quality criteria generally converged either at the average of all respondents, or slightly lower. Clinicians felt more negatively about the views of their clients/funding bodies than Designers and all other respondents. See figures 2 and 3 below.
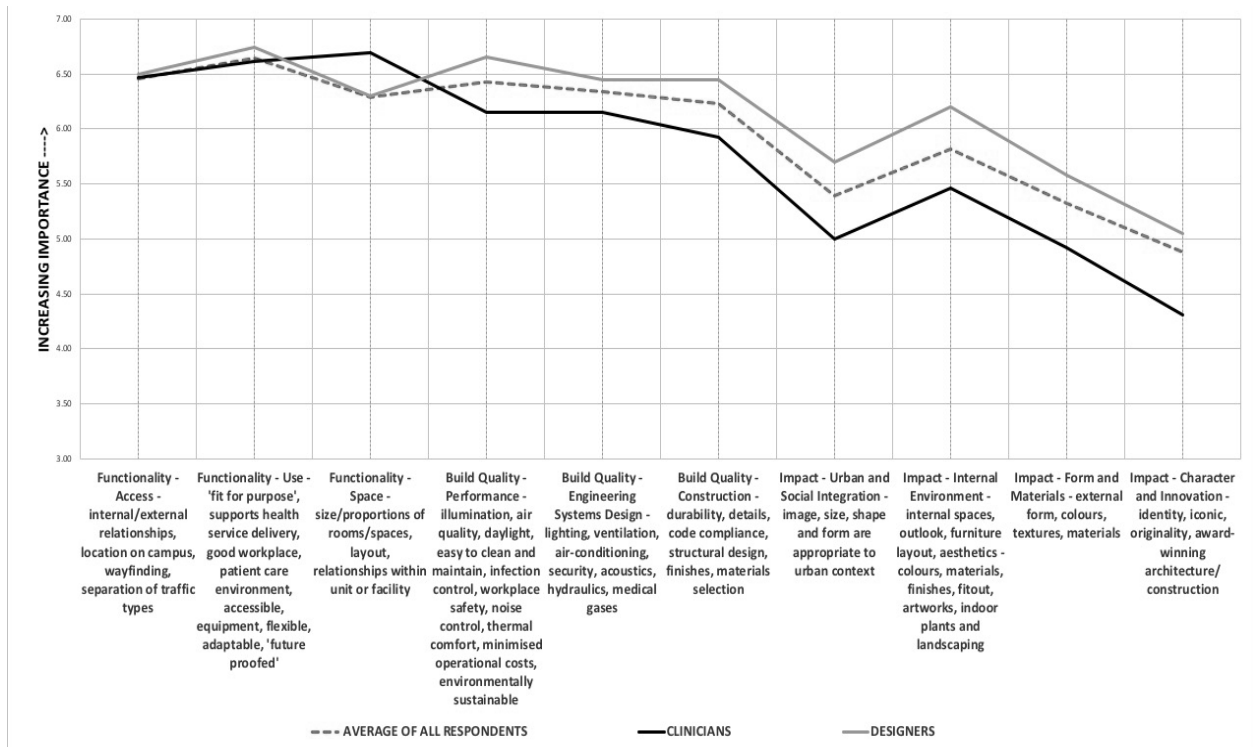
Figure 2: Design Quality Attributes - personal assessment : designers and clinicians
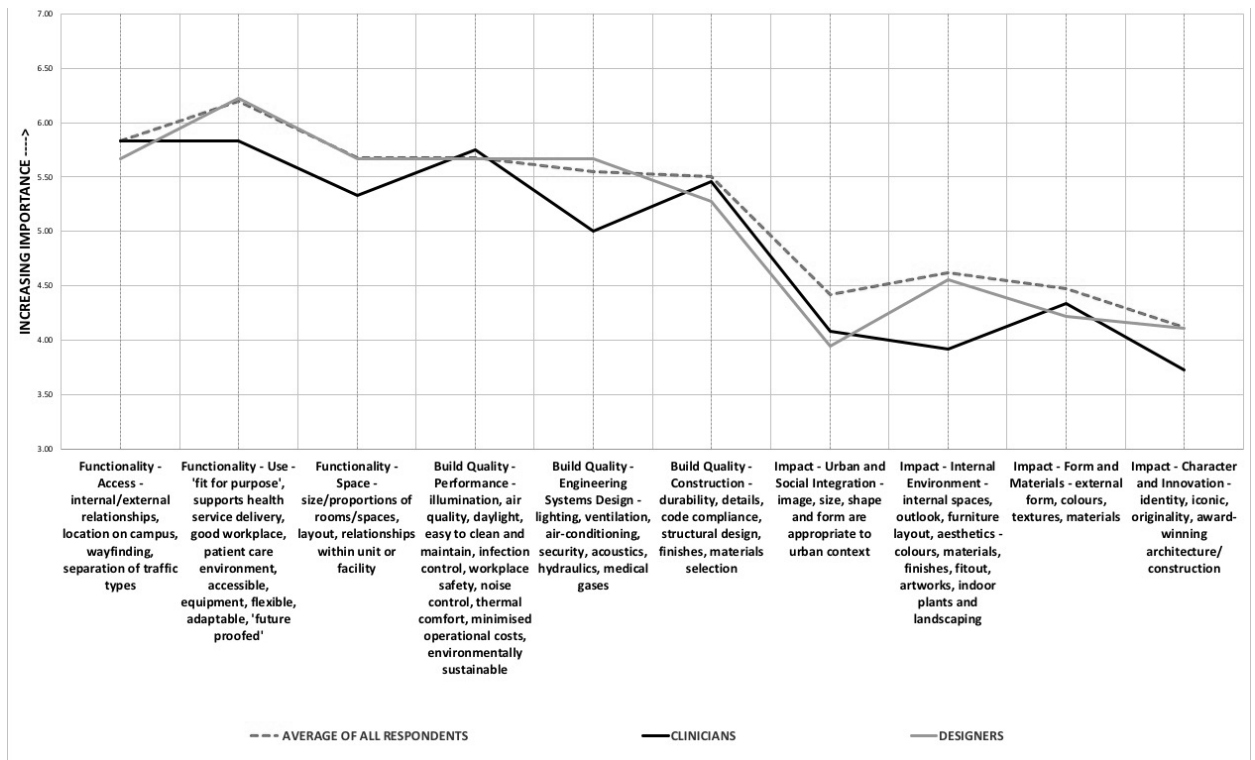

Figure 3: Design Quality Attributes - perception of client views : designers and clinicians

Overall, most respondents felt that the user group process achieves design quality at least adequately or better for their projects as they personally defined it. However, results

varied by discipline, with (4, 31%) of clinician respondents answering that it did so poorly or very poorly, compared to only (4, 20%) of designer respondents answering in this manner. Most respondents also felt that the user group process achieves design quality at least adequately or better for their project clients. See figures 4 and 5. Managers were very positive with (4, 100%) feeling that the process achieved design quality well or very well from a client's point of view. Those who rated it as poor or very poor were more likely to be designers at (5, 26% of designers), plus one clinician (1, 7% of clinicians).
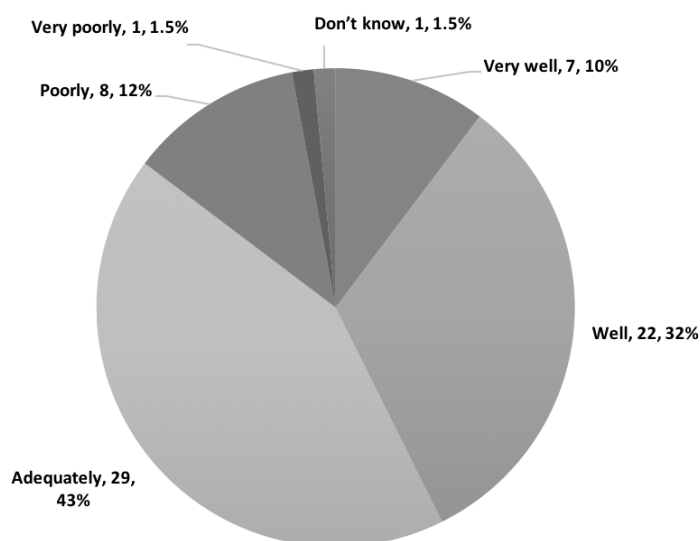

Figure 4: Extent the process achieves design quality as personally defined : all respondents
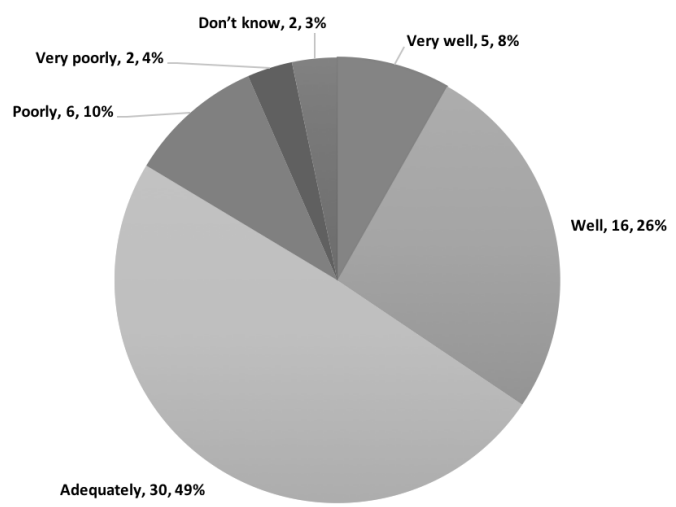

Figure 5: Extent that process achieves design quality as defined by project client / funding body : all respondents

Project Success Criteria

Overall, Performance and Product were rated more highly than the Process dimensions by all respondents, who also believed that they place more importance on the majority of components than their project clients. Specifically, they believed that project clients / funding bodies rank "Performance – on time or earlier", "Performance – on or within budget", and "Process – achieve project-specific political or social factors" as the most important of all the components. Perhaps not surprisingly, the lowest ranked component in terms of importance across all respondent categories was "Process - profitability for the building contractor".
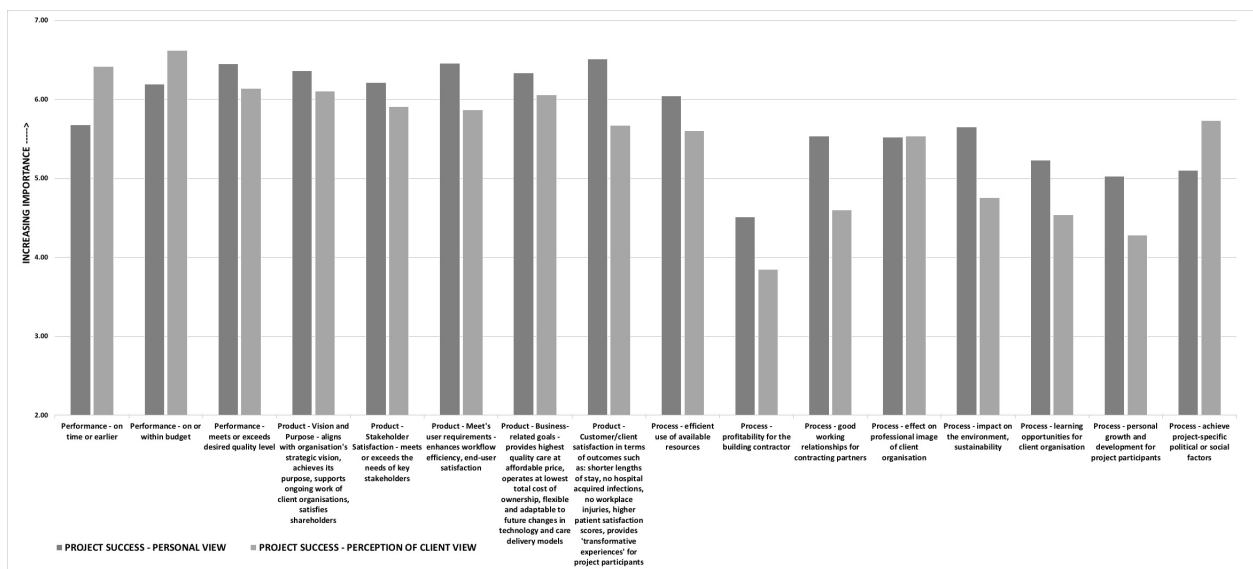

Figure 6: Assessment of Project Success Attributes - personal view and perception of client view : all respondents

In terms of specific discipline responses, there was a high level of agreement. However, designers more closely reflected the average of all respondents, while clinicians felt that "Process – profitability for the building contractor", "Process – learning opportunities...", "Process – personal growth..." and "Process – achieve project-specific political or social factors" were much less important than other respondents. Conversely, clinicians also felt that "Process – efficient use of resources" was more important than other respondents and felt that their project client perceived many project success components to be less important than

other respondents felt about their clients. Clinicians suggested that "Product – customer/client satisfaction" is less important to project clients than designers believed, and that clients rank "Process – achieve project-specific political or social factors" more highly than all other respondents believed. See figures 7 and 8 below.
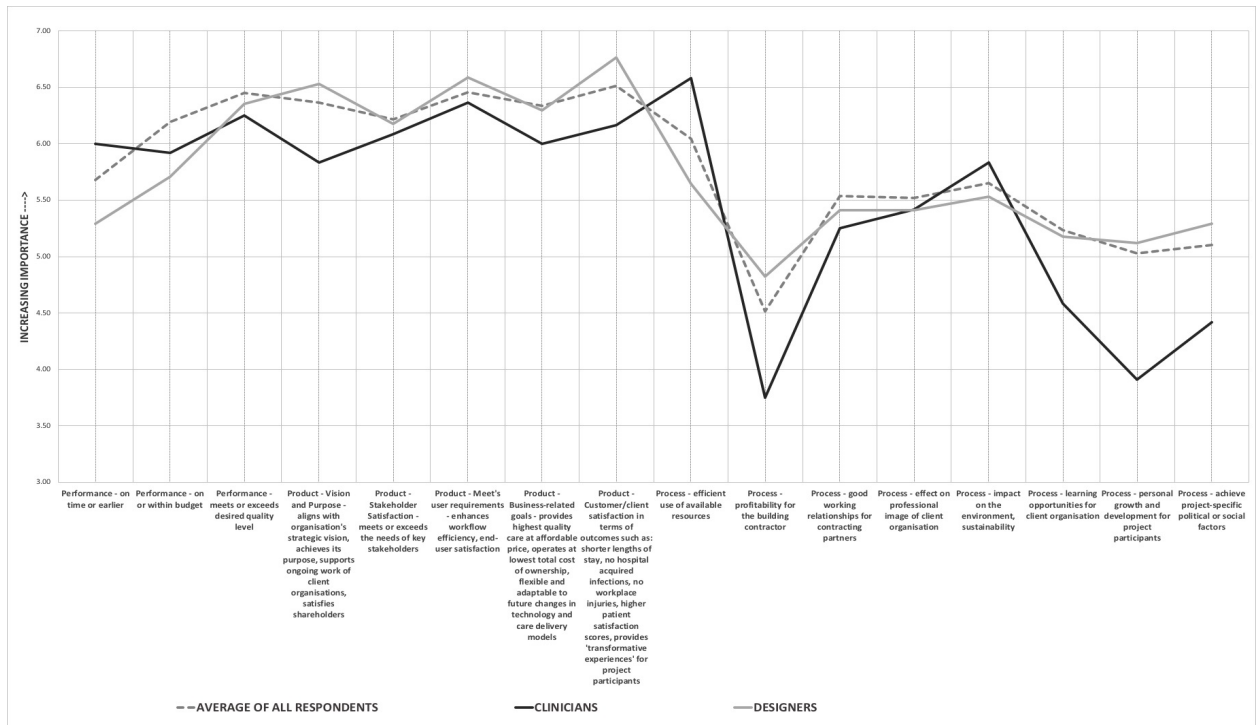

Figure 7: Project Success Attributes - personal assessment : designers and clinicians
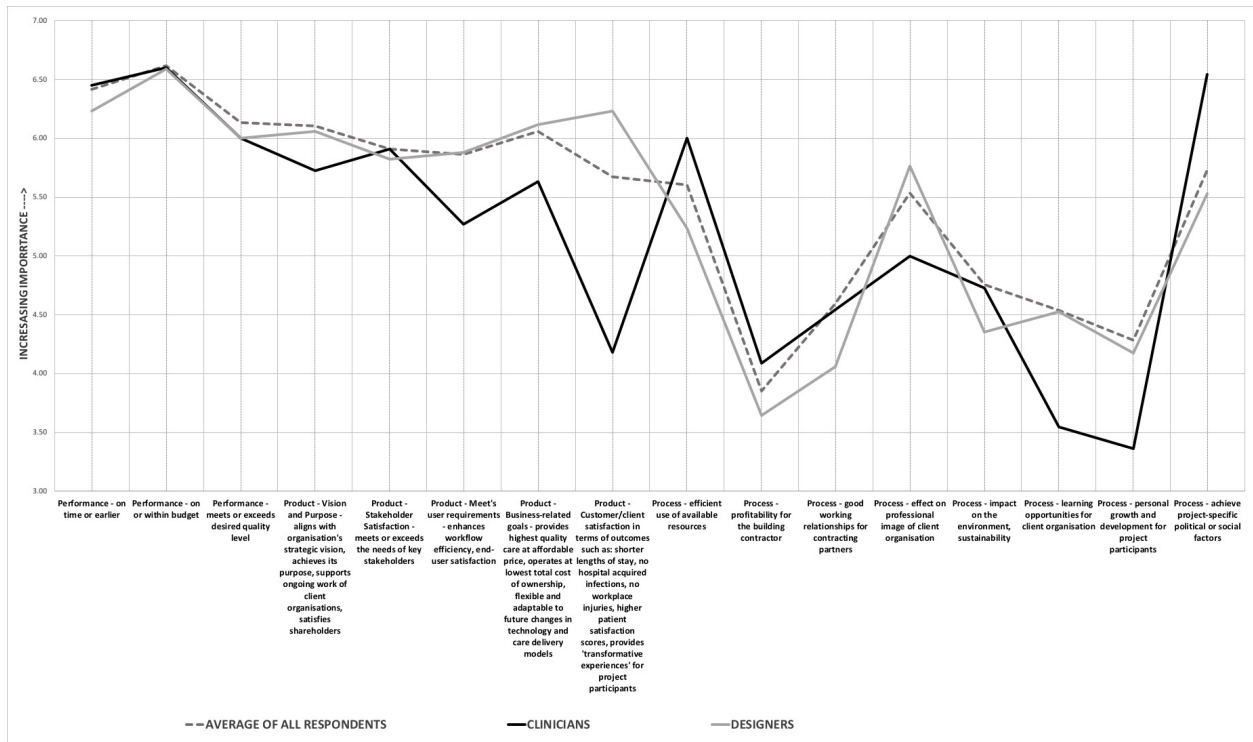
Figure 8: Project Success Attributes - perception of client views : designers and clinicians

Most respondents felt that the process achieved project success at least adequately or better as they personally defined it. Those most likely to feel that it did so poorly were Designers (3, 16.7%), Clinicians (2, 16.7%) and Service Planner / Health Planners (1, 25%). Most respondents also believed that their project clients felt more positively about the outcomes of the user group process than they did personally. Those most likely to believe that project clients felt it achieved its outcomes very well or well were Managers (3, 42.9%), Service / Health Planners (2, 40%), and Designers (5, 27.8%). Those who believed that project clients felt it did so poorly were Clinicians (1, 9.1%) and Designers (2, 11.1%).

Connection between Design Quality and Project Success

The final question asked respondents to consider the extent to which design quality and project success are connected both personally, and from their perception of their project clients' views. More than half (33, 51%) personally felt that this connection was very strong, compared to (3, 5%) who perceived that their project clients communicated the same degree

of connection. Most respondents felt that their clients saw some connection, although not strongly (28, 43%), or only moderately strongly (18, 28%). See Figure 9.
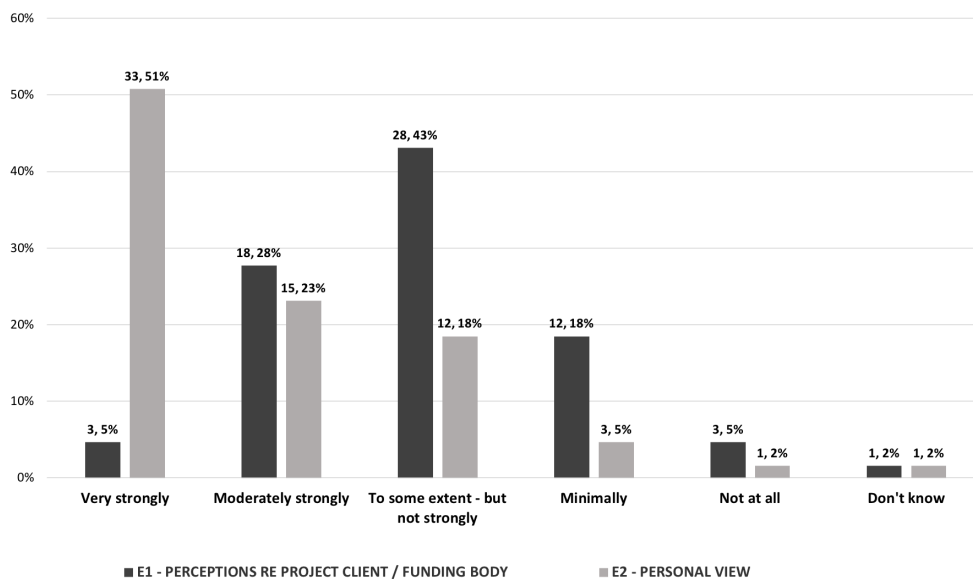

Figure 9: Connection between design quality and project success : all respondents

Open-ended Commentary

Themes. For both "design quality" and "project success", the main themes or concepts articulated by respondents were: 1) functionality; 2) budget/cost; 3) aesthetics - internal/external; 4) innovation; 5) process issues (including time program); and 6) user group membership. Analysis of the final question that asked for any additional comments regarding the connection between "design quality" and "project success" for a healthcare projects resulted in the modification of these themes slightly to 1) functionality; 2) budget/cost; 3) aesthetics - internal/external; 4) innovation; 5) process issues (including time program); 6) user group knowledge; and 7) importance of the connection between design quality and project success.

Design quality. Commentary focused on, in order: 1) process; 2) functionality; and 3) budget/cost. Suggestions were offered for improving the conduct of user group consultation, including better development of shared goals and objectives including defining "quality" measures, enhanced facilitation and leadership to integrate the perspectives of different user

group members and to manage users' expectations, plus the development of metrics to assess whether the required design goals were achieved. Clinicians often considered that functionality was mutually exclusive to aesthetics or innovation, whereas designers viewed this quite differently. Designers, including architects and engineers, appreciated the importance of functionality, yet also noted the need for a quality environment as well with one architect saying that "the process tend[s] to focus on function and not [on a producing a] quality environment."

Project success. Commentary focused on, in order: 1) process; 2) budget/cost; 3) innovation; and 4) functionality. Like those for design quality, process-related comments noted the need for better definition of project goals, more effectively working together as a team, and more consistent measurement of outcomes as suggested by one project manager / director: "Governance structures, project objectives, design principles and critical success factors need to be agreed and communicated widely to the project team and key stakeholders via a detailed project execution plan and regular updates". Unfortunately, this does not seem to occur on every project as responses to this research indicate.

The connection between design quality and project success. Commentary focused on, in order, 1) process; 2) the importance of the connection between design quality and project success; and 3) functionality. Many comments repeated those made previously, and mainly focused on better defining and setting goals and objectives, agreeing the balance of priorities and any necessary compromises, and providing better leadership / facilitation. Table 4 shows a selection of the commentary received, edited to reduce excessive duplication. Most respondents saw a much stronger connection between design quality and the success of a project than they believed their clients did, and the quantitative and qualitative results suggest this equally strongly. Respondents indicated their belief that quality was often lower when project clients focused on satisfying political imperatives such as those driven by reporting to

government funding authorities. These usually included delivering a project on time and within budget, even if this compromised other important quality measures such as lowered operating costs, environmental sustainability, aesthetics, or the long-term flexibility and adaptability of a healthcare facility.

Table 4:
Selected commentary from open-ended questions

Question C - design quality

Themes identified	Discipline	Commentary
• process (incl time) • user group membership	Clinician - doctor	Vast sums of money were wasted by the inefficient process of having untrained clinical staff leading the design process.
• functionality • aesthetics (importance) • budget/cost	Clinician - doctor	This is primarily a 'hospital'. It needs to be functional. One would hope that experience[d] hospital designers know what works. Public hospitals in NZ cannot afford to be 'original'. Given financial constraints, no additional expense should go into making a hospital look fancy/innovative from the outside.
• functionality • aesthetics (importance) • process (incl time) • innovation	Clinician - nurse	My experience has resulted in assuming that our project clients were focused primarily on financials and the aesthetics inside and out. Poor consideration was given to innovation, design and functionality. Exposure to different ways of thinking about design and innovation and respecting the USER group input by the project client would have changed my experience.
• process (incl time)	Clinician - nurse	The few meetings I attended, my manager gave me little forward notice, so I had little time to read through information and look at plans.
• functionality • aesthetics (importance) • process (incl time)	Clinician - nurse	I believe in function over aesthetic[s] as a way of maximising public money and believe patients won't care what it looks like, as long as it works.

• process (incl time)	Designer - architect/ interior architect	Achieving design quality requires good design guidelines/standards, good design teams, effective leadership from health service executive as well as user consultation.
• process (incl time) • user group membership	Designer - architect/ interior architect	Clients & Funding bodies need to "tick the box" about user consultation and approval. More focussed allocation of responsibility and/or delegation & reporting responsibilities can help considerably - everyone does not need to be involved in every decision.
• budget/cost • aesthetics (importance) • process (incl time)	Facility manager	Funding body interest relates largely to expenditure being achieved to meet projected cashflows, and achieving project progress which meets the political imperatives (public health projects) of the initiative. Providing design quality is satisfactory and attracts no political backlash, it is deemed to be acceptable. The design process must be comprehensive and not abbreviated for a quality design outcome. There are often competing priorities in this area to be managed. Facility executive level engagement is key to moving beyond funding body approval to user and client approval.
• process (incl time) • user group membership	Management	In my experience the Project Clients in some instances have a limited comprehension of some [of] the more intangible quality criteria, particularly in the areas of building form and urban context. The user group input has generally been more meaningful and helpful in informing the design layouts of the clinical spaces within the facility.
• functionality • aesthetics	Project manager/ project director	The funders do not typically care what the building

(importance)		looks like - they are just happy that it works.
• process (incl time) • user group membership	Project manager/ project director	With good quality consultants this can be achieved without user consultation.
• budget/cost • process (incl time)	Project manager/ project director	Budget constraints and tight planning programmes typically ensure that design quality is compromised.
• process (incl time)	Service planner/ health planner	To be achieved it must initially be identified as a project objective and included in the evaluation criteria at each project milestone.

Question D - project success

Themes identified	Discipline	Commentary
• budget/cost • process (incl time)	Clinician - doctor	Design and finance team were satisfied but at times ignored new ideas that would have improved efficiencies or reduced risk as they were budget and process focused and their decisions would impact clinicians but not them directly
• innovation (required) • process (incl time)	Clinician - nurse	I think the project clients were as frustrated with the whole process as much as the USER groups were. It was often said by various persons that they disliked the USER group process as it set up unrealistic USER expectations. This shows a lack of respect for the people who will use the building and support for innovation and design by USERS.
• functionality • process (incl time)	Consultant - User Group Facilitation	A healthcare facility project (as with any) is around relationships and mutual benefits for all parties. Working together as a team no matter the particular project focus results in the best results within the constraints of the process. There is no point in designing a facility if it does not meet the client and funders requirements to enable healthcare provision. Environment, sustainability of the facility and future

		healthcare provision models are high on the radar for any healthcare projects.
• functionality • innovation (required) • process (incl time)	Designer - architect/ interior architect	User process has tended to focus on delivery to standard and not real success. Shared goals and expectations are not the norm.
• process (incl time)	Designer - architect/ interior architect	User group consultation is only a small contributor to project success. The form of contract ie managing contractor, the price, expectations of all parties, quality of the brief, planning and programming before the user group process starts.
• budget/cost • process (incl time)	Designer - architect/ interior architect	It is important to establish what are the goals early in order to be able to achieve success. The funding body's goals may be quite different from the users - it may be difficult to achieve success for both! (eg: users' requirements may require higher costs than the funding body is willing to invest.)
• process (incl time)	Designer - architect/ interior architect	Project success requires particular attention to KPIs - non numeric ones in particular, and especially how they are to be measured. this can then flow into the groups evaluating the consultation at each level of detail and point within the project. This makes for a much more consistent and coherent project.
• budget/cost • innovation (required) • user group membership	Designer - engineer	The more corporate the client, the more abstract the engagement and more focussed on financial metrics they will be. It becomes much more transactional and given the very high mobility of medical and clinical practitioners in general, unlikely to be considered as a significant reason to change.
• process (incl time)	Project manager/ project director	Governance structures, project objectives, design principles and critical success factors need to be agreed

		and communicated widely to the project team and key stakeholders via a detailed project execution plan and regular updates.
• budget/cost • process (incl time)	Project manager/ project director	Project Success is a difficult balance. Clients always want to be at the centre of the Time-Cost-Quality triangle, but this is generally impossible to achieve. I think it's important for all to be absolutely honest at the start about which of these is ultimately the deciding factor - and with healthcare projects it should be quality, tempered by cost.
• process (incl time)	Project manager/ project director	The achievement of project success, as viewed by the various major entities involved in a project, usually results from how well the project team has aligned each party to the objectives and goals of the project from a very early date. The management of expectations, particularly where inexperienced stakeholders are involved, is crucial to the perception of what is being or what has been achieved. Again, the alignment of the various client bodies is a key to that success. Oh, and the project team actually needs to deliver what they have been commissioned to deliver.

Question E - the between design quality and project success

Themes identified	Discipline	Commentary
• process (incl time)	Clinician - doctor	Design team focused on design and left it to the builders to ensure quality. Once the design team had completed their work, they had little influence on the quality of the final product.
• knowledge of user group participants	Clinician - nurse	Some areas have less or poor value attributed to them by management / designers? from ego / lack of knowledge of area

• functionality • aesthetics • innovation (required) • process (incl time)	Clinician - nurse	A frustrating experience with a poor outcome for patients and staff! The building might be shiny and new, look good on the outside and have pretty colours but the design has certainly not maximised functionality for those who will reside in the building.
• functionality • process (incl time)	Consultant - User Group Facilitation	Design quality enables the functionality enabling service provision. The building is just one part of that project spectrum but hugely important. From a my personal, the design quality enables the models of care. If this 'misses' the mark, the project (MoC / Building / Workforce / Operationalising / future sustainability / environment etc.) success of the project would be rated low.
• functionality • process (incl time) • connection btw design quality and project success	Designer - architect/ interior architect	Failure to relate design quality and success is a failure in the process. There is more interest in "compliance" with health design standards than in the actual space or experience of staff or patients. The SoA or gross building area rules most of the time, even if people think it does not. You have to live with, or die in, poor quality!!!!!!
• functionality • process (incl time) • connection btw design quality and project success	Designer - architect/ interior architect	For health projects, design quality is about being fit-for-purpose and highly functional, "form follows function". This is integral to project success. A successful project does also provide the participants with an experience, often over a long period of time, which if viewed as a positive experience by the participants should also mean project success.
• functionality • budget/cost • aesthetics (importance) • process (incl time) • connection btw	Designer - architect/ interior architect	As a consultant, design quality is very important to me - ranging from good master plan, efficient work flow and beautiful environment. The challenge is to achieve all

design quality and project success		this within desired time and cost budgeted for the project. For the project to be successful, the design quality has to be achieved within the budgeted time and cost.
• process (incl time) • connection btw design quality and project success	Designer - architect/ interior architect	The connection is highly dependent on how the critical success factors for the project are defined at the outset and whether design and design quality are included at that stage. The aspirational stage.
• functionality • budget/cost • process (incl time) • connection btw design quality and project success	Designer - architect/ interior architect	Design Quality, in the full sense, is the essence of project success. If the quality of the result is low (functionally, build quality, etc) can the project be a success? - even if it is on time, on budget? (Time/cost/quality - pick 2?)
• process (incl time) • connection btw design quality and project success	Facility manager	From my perspective the two go hand-in-hand and it is a key point I make to my colleagues as we go through the design process.
• functionality • process (incl time) • connection btw design quality and project success	Project manager/ project director	Healthcare projects are generally 24/7 facilities, with high public access and traffic. The cost of maintaining a facility is usually the same $ value within a year or two as the capital cost of the facility. A high quality, flexible design, with the right services and finishes specifications will wear well and will be cost-effective to maintain. A project/facility which achieves this can be considered a success.
• process (incl time) • connection btw design quality and project success	Project manager/ project director	There is little understanding of design quality, and thus it is not valued. It's seen as an optional (expensive) extra.

Identification of "process" as a theme in the qualitative commentary was more nuanced than the quantitative results for project success suggested, where "Process", or

"implementation success", was ranked lower than either "Performance" or "Product" in terms of importance. One interpretation may be that respondents thought it more likely that the other components (and design quality) could be achieved if the project design and implementation processes were improved. Yet, "process", as referred to in the commentary, may mean the overall user group consultation process. The implication may be that improving this would also enhance design quality and project success outcomes. This working assumption could be tested in future research.

Discussion and Conclusions

Overall, the qualitative results offer broader and deeper findings than suggested by the quantitative survey results. Commentary was often thoughtful and detailed in comparison to simple Likert scale scoring. This illustrates the social nature of user group consultation and hence, the need for an appropriately targeted social science research methodology such as this, to understand how the process is perceived and experienced, and how it could be improved. How people feel about the process is as important as how they rate its success using numeric indicators and can be a richer source of data for determining future actions aimed at improving it.

Teasing out a definable connection between design quality and project success is essential to determining how design quality affects the success of an individual project. The user group forum is an ideal setting for determining the shared goals and visions for a project that reflect this connection, and to support working effectively with healthcare designers and other consultants to achieve them. As a result of their professional training, healthcare designers are the best placed to lead the discussions around defining and agreeing "design quality" outcomes with their project clients and user group members on their healthcare projects. This will reduce the risk of re-design or re-work, with its associated extra time and costs, for the design and other consultants, in particular, but also for the other project

participants. Healthcare designers define design quality more broadly than clinicians who often implied that every dollar spent on aesthetics compromised spending on functional aspects of a facility. This is a good place to start when developing a common user group language around design quality, and as a result, may bring to the surface differing attitudes, decision-making styles, and uses of language that stand in the way of more open communication between user group participants (especially clinicians) and healthcare designers. Similarly, although possibly better understood, project success also means different things to different user group participants, and the political dimensions to this in a publicly-funded healthcare system must also be acknowledged. Definitions also vary by organization whether government or private, yet for most user group participants generally extend beyond the traditional parameters of time and cost, to include both scope and desired quality as noted by Hamilton (2016).

More clearly defining a specific project vision that encompasses "design quality", "project success" and explains how they are related, will assist user groups and their healthcare architects to work more efficiently and effectively towards successful outcomes for their healthcare projects. Lessons may be learnt from other types of institutional projects including methods for conducting meetings and encouraging collaboration between different types of participants. Developing an education process for user group participants may assist this collaboration by enhancing communication between team members that also highlights and manages their expectations for the user group process. This will form part of the next stage of this research. The research will then conclude by investigating the development of "best practice guidelines" for user group consultation.

Implications for practice

The information in the article can be used by healthcare designers to:

1. conduct more effective and efficient user group consultation by ensuring that project clients, healthcare designers and user group participants are working towards common goals and objectives;

2. assist them to define goals and objectives with their project teams, especially "design quality", "project success" and the connection between these concepts;

3. understand the viewpoints of all project team members, especially those from different discipline areas, including their priorities in terms of project outcomes;

4. employ the definitions agreed for "design quality" and "project success" to develop performance metrics for their projects for assessment of proposed design solutions, and to underpin post occupancy evaluations so that lessons learnt can be translated to future projects;

5. determine how to adapt and develop a user group methodology to be suitable for their project, and where necessary, consider alternative strategies to improve the quality and timeliness of user input, and so enhance their healthcare design project outcomes.

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