AN EXPLORATION OF THE USE OF DELPHI METHODOLOGY IN HOUSING SATISFACTION STUDIES

Clinton Aigbavboa[1] and Wellington Thwala[2]

School of Civil Engineering and the Built Environment, University of Johannesburg, Doornfontein Campus, Johannesburg, 2028, South Africa

The Delphi technique has become generally accepted in the past decade by a broad range of institutions, government departments, and policy research organizations. The Delphi method was originally developed in the 50s by the RAND Corporation after a series of studies in Santa Monica, California. This approach consists of a survey conducted in two or more rounds and affords the participants in the second round with the results of the first so that they can alter the original assessments if they want to - or stick to their previous opinion. It is commonly presumed that the method makes better use of group interaction whereby the questionnaire is the medium of interaction. The Delphi method is especially useful for long-range forecasting, as expert opinions are the only source of information available. The objective of this paper is to outline how the Delphi technique process was used to predict and to understand issues encircling housing satisfaction in South Africa low-income housing. The paper objective is based on the premise that the technique has never been used to study housing satisfaction amongst the low income group in South Africa despite the numerous empirical studies that has been conducted; hence the framework. This is because the Delphi approach solicits expert's view on subjects surrounded with confusion. The methodological approach adopted for the study was a content analysis of published peer reviewed journal articles with regards to the use of the techniques in housing studies. The Delphi technique is discussed because it is an approved and credible research technique which helps to overcome experts' disagreement with issues.

Keywords: Delphi technique, methodology, housing studies, low-income housing

INTRODUCTION

The Delphi technique was originally developed in the 1950s as a tool for forecasting and problem solving of complex topics at the Rand Corporation by Helmer and Dalkey (Buckley, 1995). It was named after the ancient Greek temple where the oracle could be found. According to Greek mythology, the oracle at Delphi was consulted to forecast the future so that correct and timely decisions could be made before embarking upon a major course of action, such as waging war. The method adopted by the research team at Rand was that subject-matter experts could be solicited for their opinion about the likelihood of future events or scenarios.

The Delphi technique is part of a group of decision-making (policymaking) techniques that includes the nominal group technique (NGT) and interacting group method (IGM). The Delphi technique differs in various ways from NGT and IGM

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[1] aigclinton@gmail.com
[2] didibhulut@uj.ac.za

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respectively, but primarily due to the fact that Delphi is individual based, anonymous and independent. The element of group interaction is eliminated from the technique and feedbacks to questionnaires are in written format (Loo, 2002). According to Loo (2002), the Delphi process is mostly used when investigating policy-making or policy-evaluation strategies that will set the future direction for public or private sector respectively. The thesis adopting this method was aimed at setting a future direction for residential satisfaction with low-income public housing in South Africa.

Furthermore, the technique is a qualitative methodology seeking to produce a consensus of a group of experts on an issue of concern (Miller, 2001) through a survey consisting of rounds. The method is based on structural surveys and makes use of the intuitive available information of the participants, who are mainly experts. The method provides qualitative as well as quantitative results and has beneath its explorative, predictive and even normative elements (Cuhls, 2003). There is an agreement that Delphi is an expert survey in two or more 'rounds' in which the second and later rounds of the survey (the results) of the previous round are given as feedback. That is, the participant's answers from the second round under the influence of the other experts opinions. Thus, the Delphi method is a relatively strongly controlled group communication process, in which matters, on which naturally unsure and incomplete knowledge is available, are judged upon by experts' (Häder and Häder, 1995). The technique requires knowledgeable and expert contributors individually responding to questions and submitting the results to a central coordinator or a researcher conducting the study. The coordinator (researcher) processes the responses, looking for central and extreme tendencies, and their validations (Grisham, 2006). The results are then fed back to the input provided by the coordinator (researcher). The experts are then asked to resubmit their opinions, aided by the input provided by the coordinator (researcher). This process continues until the coordinator sees that a consensus has been formed.

The technique removes the bias that is possible when diverse groups of experts meet together which is common with other method of decision making. In the Delphi method, the experts do not know who the other experts are during the process. Hence, the Standard-Delphi-Method is a survey which is directed by a coordinator (researcher) as already stated, comprises several rounds with a group of experts, who are anonymous among each other and for whose subjective-intuitive prognoses a consensus is aimed at (Cuhls, 2003). After each survey round, a standard feedback about the statistical group judgement calculated from median and interquartile range of single projections is given and if possible, the arguments and counter arguments of the extreme answers are fed back. In the Delphi process, nobody 'looses face' because the study is done anonymously using a questionnaire. Rowe and Wright (1999) and Häder and Häder (1995) informs that it is commonly assumed that the method makes better use of group interaction whereby the questionnaire is the medium of interaction. The method is especially useful for long-range forecasting, as expert opinions are the only source of information available.

Over time, the method has gained popularity across many scientific disciplines as a method of inquiry. Czinkota and Ronkainen (2005) indicate that the Delphi method has gained considerable approval across disciplines. They inform that it has been used as a study instrument in the fields of library and information science (Buckley, 1995), in the medical disciplines (Linstone and Turoff, 1975), in multi country studies of communications in Europe (www.feiea.org.uk, 2003), and by actuaries to predict economic conditions (SOA, 1999). Czinkota and Ronkainen further report that those

experienced with the Delphi technique report that the method produces valuable results which are accepted and supported by the majority of the expert community. Similarly, in the business field, the technique has been rated highly by some as a systematic thinking tool, but has been challenged in its ability to serve as an identifier of strategic issues (Schoemaker, 1993). Mitchell (1991) in the review of the use of the Delphi techniques, found in an earlier study (Rieger, 1986) that PhD candidates that used Delphi increased from 61 (1970-1974) to 441 (1980-1984), and that they included an incredibly wide range of disciplines and topics. Hence the thesis that adopted this technique was aimed to attract a wide spectrum of inputs form various geographically dispersed experts in South Africa, the Delphi technique is well suited as a research approach and method.

Delphi as a research method has had it fair share of criticism, support and debate on epistemology (Mullen, 2003). Foremost amongst the criticism is Delphi's alleged failure to follow accepted scientific procedures, in particular the lack of psychometric validity (Sackman, 1974). In respond to the criticism, Coates (1975) states that if it is believed that the Delphi technique is of value not in the search for public knowledge, but in the search for public wisdom; not in the search for individual data but in the search for deliberative judgement, one can only conclude that Sackman missed the point. However, it should be noted that the approach deals with areas that do not lend themselves to traditional scientific approaches; hence Helmer (1983) argues that the forecasting tendency, one of the major applications of the Delphi, is inevitably conducted in a domain of what might be called 'soft data' and 'soft law'. Helmer further posit that standard operations research techniques should be augmented by judgemental information and that the Delphi method cannot be legitimately attacked for using mere opinion and for violating the rules of random sampling in the 'polling of experts'. Such criticism Helmer argued that they rest on a gross misunderstanding of what Delphi is; it should be pointed out that a Delphi inquiry is not an 'opinion poll'. As all the above definitions illustrated, in no instance is reaching a majority opinion the ultimate goal in a typical Delphi studies; it is rather the reaching of agreement. According to Buckley (1995), Delphi is a tool for discovering agreement and identifying differences rather than forcing consensus. Buckley (1995) further informs that: in principle, agreement alone is not a sufficient condition for arguing the Delphi is acceptable. But as with the majority of research methods, the method of use and application has an enormous influence on the eventual success of the inquiry. Hence, where no agreement develops, the Delphi still helps to clarify the issue been investigated. Thus Linestone and Turoff (2002) assert that one of the common reasons for failure in a Delphi is ignoring and not exploring disagreement or point of departure, which the research that adopting the technique embraced. In addition to the above criticism of the Delphi technique, different authors also state different weaknesses of the Delphi Technique (Lang, 1995). Notable amongst them include:

It has not been shown consistently that the results from the Delphi method are any better than those achieved through other structured judgmental techniques (Rowe, Wright and Bolger 1991);

The Delphi study is at the mercy of the world view and biases of the coordinating or monitors team (researcher), who choose the experts, interpret the returned information and structure the questions. There is an enormous debate whether the experts should be chosen from within or outside the organisation initiating the study and whether they should be experienced in the subject area of the study in question (Masini 1993);

Another limitation according to Linstone (1978) is on the way the process and questionnaire is structured, which Linstone believes can lead to a bias (like IQ tests), which assume a certain cultural background. Hence, the experts may give responses they think the monitoring group wants to hear, or they may not respond at all. Consequently, the cultural background of respondents will impact upon the results;

Likewise, Simmonds (1977) debates that one of the key flaws in the Delphi technique is that certain questions are not asked as they do not seem important when the study begins. Nonetheless, once the study begins, new questions cannot be added, which in turn can weaken the study considerably;

Also, Lang (1995) states that the process of choosing the panellists is often not considered seriously enough. Yet, it is the calibre of the panellists which determines the quality of the outcomes of the study (Lang, 1995). A major consideration was given to this particular criticism, hence a list of criteria was set for the panellist to fulfil;

In the process of achieving consensus, extreme points of views run the risk of being suppressed, when in fact they may provide important new information or insights (Lang, 1995);

The flexibility of the technique means it can be adapted to a whole range of situations which in turn can make it vulnerable to misrepresentation and sloppy execution (Amara 1975); and

Garrod (2008) found that the Delphi technique can be extremely sensitive to: the level of panellists' expertise; the composition of the panel; clarity of the questions; the way the research or coordinator reports reasons for outliers and the administration of the questionnaire

Despite the limitations noted above from different scholars, Brill et al. (2006) describe the Delphi as a particularly good research method for developing consensus among a group of entities having expertise on a particular topic where information required is subjective and where participants are separated by physical distance (Linstone and Turoff, 1975). Brill et al. further states that the Delphi method has been validated in the literature as a reliable empirical method for consensus reaching in a number of areas. Amongst these areas include distance education (Thach and Murphy, 1995), journalism (Smith, 1997), visual literacy (Brillet al., 2000), electronic commerce (Addison, 2003), health care (Whitman, 1990) and others. Beside these areas, the method has also been used in many other disciplines such as in information technology (IT) research to identify and rank key issues for management attention (Delbecq et al., 1975; Keil et al., 1998); scientific study of GIS (Hatzichristos and Giaoutzi, 2005), quality management (Saizarbitoria, 2006), terrorism (Parente et al., 2005), banking (Beales, 2005), social sciences (Landeta, 2006), privatization of utilities (Critcher and Gladstone, 1998), education (Yousuf, 2007), amongst others. The above instance proves that the Delphi method in research is an accepted practice. However, as discussed above, it is not appropriate for all research activities.

Consequently, the objective of this paper is to analyse how the Delphi technique was used to predict and to understand issues encircling housing satisfaction in South Africa low-income housing. This was done in order to determine the attributes that predict housing satisfaction. The paper describes the Delphi technique by investigating its advantages and disadvantages, before illustrating the process of execution. The paper commences by describing the technique through an investigation

of its advantages and disadvantages, before illustrating the process of execution. This was followed by a brief statement on the epistemological approach of the Delphi techniques for the study; when to use the method; components of the techniques and the process of execution of the technique for the referenced study.

Epistemological approach towards the Delphi design

The variance amongst the various group techniques and the definition of the Delphi method as complied by various scholars and cognisance of the various criticisms forms the epistemological foundation for defining the approach towards a typical Delphi study design. Amongst these include reducing the effects of personal bias. This is done by assuring that all expert feedback is anonymous. Through this, the technique captures the opinions, experience, and knowledge of each panel member. Personal knowledge is harvested and interpersonal interaction biases are stripped away.

According to Scheele (2002), the concreteness of the framework of the Delphi design is vital in researching the overall objective of the study. The basic premises of the Delphi research design towards a typical housing study designed, is entrenched in some form of general agreement and consensus regarding the core ingredients and components of the subsequent framework. Given the current status of low-income housing in South Africa and the absence of generally agreed housing issues, the search for consensus and a point of departure in issues on housing policy that will better serve the low-income group is therefore justified through the use of the technique. Hence the objective of the Delphi design for this study is to obtain the most reliable consensus of opinion of a group of experts in the specific field being studied. According to Lang (1995), the Delphi technique is mostly used to solicit the opinions of experts to determine the timing and possible occurrence of future events. It is a method that is best used where there is little past data available applicable to extrapolate from, and where social, economic, ethical and moral considerations are pre-eminent. Considering the outcome of literature review of the current research (there is no structured research so far carried out which has adopted the technique with regards to a housing study for the low-income group in South Africa) and definition, function and nature of Delphi technique, it is justified that, Delphi technique was the best method to explore the subject of the research and to achieve the aim and objectives.

When to use the Delphi technique

The Delphi method is mainly used when long-term issues have to be assessed such as the subject of the current research. This is because it is a procedure used to identify statements (topics) that are relevant for the future; it reduces the tacit and complex knowledge to a single statement and makes it possible to judge upon (Cuhls, 2003). Hence the use in combination with other methodologies like survey design can be interesting. On the other hand, in more complex issues, when the themes cannot be reduced that much or when thinking and discussions in alternatives are the major target. It is also suitable if there is the (political) attempt to involve many persons in

processes (Eto, 2003). Hence, Linstone and Turoff (2002) argue that one or more of the following properties could lead to the need for the use of the Delphi technique:

When the problem of inquiry does not lend itself to precise analytical techniques but can benefit from subjective judgments on a collective basis (Buckley, 1994);

The research need to contribute to the examination of a broad or complex problem with no history of adequate communication and may represent diverse backgrounds with respect to experience or expertise, which was a major premise of the research;

More individuals are needed than can effectively interact in a face-to-face exchange;

Time and cost to make frequent group meetings is limited;

The efficiency of face-to-face meetings can be increased by a supplemental group communication process;

Disagreements among individuals are so severe or politically unpalatable that the communication process must be refereed and/or anonymity assured;

The heterogeneity of the participants must be preserved to assure validity of the results, such as the avoidance of domination by quantity or by strength of personality called the "bandwagon effect".

According to Cuhls (2003) the Delphi method as a foresight tool seems to possess certain degrees of invariance to survive in the changing challenges of the past 50 years. Hence the process could serve different understandings of predicting or premonition and is probably understood by the users as being relevant for covering technical perspectives, organisational perspectives, but also personal perspectives. Cuhls further emphasis that what the users of the Delphi technique especially like are the sets of data about the future that are collected. Writing down future topics seems to have an immense psychological effect because it transfers implicit to tacit knowledge to the more visible, explicit, and therefore transferable knowledge (Cuhls, 2003).

RESEARCH METHODOLOGY

The research was conducted with reference to existing theoretical literature, published and unpublished literatures with a deep exploration of their context in order to meet the research objectives. The study is mainly a literature review and looks at how the Delphi technique can be used to predict and to understand issues encircling housing satisfaction in South Africa low-income housing. This is presented through the discussion of how the Delphi technique was employed in the study. This approach was adopted in other to overcome the confusion surrounding the constructs that brings about residential satisfaction in South Africa subsidised low-income housing; because the Delphi approach solicit expert's view on issues in a systematic approach.

Components of the Delphi technique

The main components of the Delphi technique according to Loo (2002), consists of five major characteristics, which was also adopted in the study:

The study should consists of a panel of carefully selected experts representing a broad spectrum of opinion on the topic or issue being examined;

The participants are usually anonymous;

The coordinator (researcher) constructs a structured questionnaires and feedback reports for the panel over the course of the Delphi;

It is an iterative process often involving three to four iterations called 'rounds' of questionnaires and feedback reports;

There is an output, typically in form of a research report containing the Delphi results, the forecasts, policy and program options (with their strengths and weaknesses), recommendations to senior management and possibly an action plan for developing and implementing the policies programs.

Likewise, Hasson et al. (2000) recommended that the following research guidelines for using the Delphi technique be addressed in designing a Delphi approach: Research problem identification; Understanding the process; Selection of experts; Informing / invitation to experts; Data analysis; and Presentation and interpretation.

Therefore, given the nature of the research, it was further believed that the Delphi technique is well suited to obtain credible inputs from experts in industry, academics, government and NGOs to serve as key input towards the research objectives. The next sections provide an overview of how the Delphi technique was used in this study.

DESIGNING, CONSTRUCTING AND EXECUTING THE DELPHI STUDY

Given the rationale behind the Delphi technique and the main features explained above, the design, construction and execution of the Delphi study for the current research followed a sequential process as suggested by Loo (2002). According to Loo, four vital planning and execution activities was followed, which are: Problem definition; Panel selection; Determining the panel size; and Conduction the Delphi iterations. Supporting Loo (2002) approach, Delbecq et al. (1975) suggest a basic Delphi methodology that includes distinct stages such as, Delphi question development (objective), expert panel selection, sample size, first questionnaire, first questionnaire analysis and follow-up questionnaires. This methodology forms the basis of the research study and is explained in the subsequent sections. Figure 1 gives a summary of the Delphi design, construction and execution.

Stage 1 – Delphi question development

The formulation of the Delphi question is vital to the whole process. It is paramount that the panel of experts understand the broad context within which the questionnaire is designed. I order to achieve the objectives of the study, key questions were asked. The basis of constructing the questions for this study was based on the guidelines given in Table 1, with corresponding wording and phrasing given for this study.

Table 1: Delphi question formulation

Key Delphi questions?	Phrasing for this study
Why are you interested in this study?	This study was initiated because of the belief that not all occupants of low-income houses are satisfied with their houses. Therefore this assumption is concrete because there is lack of understanding of the diverse features that determine housing satisfaction.
What do you need to know that you do not know now?	Despite the knowledge about the features that brings about residential satisfaction; yet, they have not be arrange together to inform policy and predict housing satisfaction in the low-income group in South Africa. At the end of this study, it should be obvious what the attributes are that determine residential satisfaction in low-income housing.
How will the results from the Delphi study influence housing satisfaction?	The result of the Delphi study will enable the development of a conceptual framework for housing satisfaction in South Africa. Hence the attributes which predict housing satisfaction in South Africa low-income housing will be established.

Stage 2 – Delphi expert panel selection

A critical part of conducting a Delphi interview technique is selecting the right experts (also known as panellists, participants or respondents) and their role is crucial to the success of the research (Hasson et al, 2000). Experts must be sufficiently interested and involved in the subject being examined to ensure high commitment response rate. According to Hasson et al (2000), controversial debate rages over when a professional becomes an 'expert'. The claim that one group represent's valid expert opinion has been criticised as scientifically untenable and overstated (Hasson et al, 2000).

For the purpose of this research McKenna's (1994) definition of 'expert' as being a panel of informed individuals otherwise called experts hereafter was used. McKenna (1994) definition was further supported by Goodman (1987:730) stating that the Delphi technique "tends not to advocate a random sample of panellist … instead the use of experts or at least of informed advocates is recommended". Likewise, Helmer (1977:18-19) argues that since a "Delphi inquiry is not an opinion poll, relaying on drawing a random sample from the population of experts' is not the best approach, rather, once a set of experts has been selected (regardless of how – but following a predetermined qualifying criteria), it provides a communicative device for them that uses the conductor of the exercise as a filter in order to preserve anonymity of responses" which is core to the Delphi technique. Therefore, Linstone (2002) states that the most significant danger in selecting the panel of expert lies in the path of 'least resistance' through the selection of a group of cosy friends and / or like-minded individuals, which thus negates the strength of the process.

Panellists form the cornerstone of the Delphi technique; and clear inclusion criteria should be applied and outlined as a means of evaluating the results and establishing the study's potential relevance to other settings and populations (Igbal and Pipon-Young, 2009). According to Dalkey and Helmer (1963), there are detailed criteria for

the selection of panel experts; recommending that in a typical Delphi study, experts should meet the following two recommendations which were also postulated by Rodgers and Lopez (2002). The first recommended criteria are that the experts should exhibit a high degree of knowledge of experience in the subject matter. Another criterion is that they should be the representative of profession so that their suggestions may be adaptable or transferable to the population.

Similarly, Adler and Ziglio (1996) stated that the Delphi participants in any study should meet four "expertise" requirements, which are: knowledge and experience with the issues under investigation; capacity and willingness to participate; sufficient time to participate in the Delphi; and effective communication skills. In choosing panellists for this study, each expert was required to meet at least five of the following minimum criteria: Residency: Have lived or is living within one of the South Africa Metropolitan Municipalities cities; at least more than one year; Knowledge: Has knowledge of the low-income housing situation in South Africa; Academic Qualification, has been presented an earned degree (National Diploma/B-Degree/M-degree/PhD) related to any field; Experience: Has a history of / currently is performing consultation services for a South Africa organ of State, individuals, businesses, agencies, companies, and/or organizations, relating to the low-income or other sustainable development or human settlement context. Employment: Currently serves (or has previously served) in a professional or voluntary capacity (e.g., at place of employment - institution, business, agency, department, company) as supervisor or manager of establish that is involved with housing or sustainable development related issues in South Africa; Influence and Recognition. Has served / currently is serving as a peer-reviewer for one or more manuscripts received from a journal editor prior to its publication in the primary literature, with focus of the manuscript(s) on housing or sustainable development; Authorship: Is an author/co-author of peer-reviewed publications in the field of housing with emphasis on South Africa; Research. Has submitted one or more proposals to or has received research funds (grant/contract) from national, provincial, local government, regional, and/or private sources that support housing development and studies for the low-income group or other human settlement related issues; Teaching. Has organised, prepared, and successfully presented one or more housing or human settlement or sustainable development training workshops focusing on the group for which expertise is sought; Membership: Member of a professional body. Should be the representative of a professional body so that their opinions may be adaptable or transferable to the population; Willingness: Panel members must be willing to fully participate in the entire Delphi studies.

The adoption of five criteria was considered more stringent than the recommended number of at least two criteria by Rodgers and Lopez (2002) and Dalkey and Helmer (1963). The five minimum criteria were framed after the four recommendations made by Adler and Ziglio (1996), with the inclusion of experts' residency status, which was considered to be compulsory for all selected experts. This was considered significant because experts were required to have a sound understanding of the low-income housing context in their residential Metropolitan Municipality cities since the setting

for the study though a case study of South Africa is based on the three metropolitan municipality cities. Also, a minimum number of five criteria were set because the method may be undermined if panellists are recruited who lack specialist knowledge, qualifications and proven track records in the field (Keeney et al., 2001) amongst others. Although of course expertise comes in many guises and may include those who are 'experts by experience' (Hardy et al., 2004). In general, a varied panel is considered best in producing a credible Delphi study and individuals who might provide a minority or differing perspective should be actively recruited to the panel (Linstone and Turoff, 2002), which was adopted for the study. With regard to the recruitment process itself, panellists were recruited via e-mail, with a brief overview of the study objective. Thereafter, those that consented to the preliminary invitation were sent a detailed description of the Delphi study. Hence all experts selected for the current study met the five criteria's set for the study. After the verification exercise, selected experts were then sent the first round questionnaire survey which was presented in form of both closed and open-ended question.

Stage 3 – Determining the panel size

Since the nature of the Delphi technique calls for a qualitative rather a quantitative approach, the use of experts for input indicates that the number of participants should be expected to be much lower than normal quantitative surveys. Determining the minimum number of experts to participant in a typical Delphi survey has been a subject of debate overtime. Various scholars have recommended different sample size. For instance, Helmer and Dalkey used a panel of seven experts in their original Delphi experiment in 1953 (Helmer, 1983). Linstone (1978:296) finds that "a suitable minimum panel size is seven". Linstone justified this by saying that the research runs the risk of accuracy deteriorating rapidly as number increases. Hence Linstone's observation was supported by Cavalli-Sforza and Ortolano (1984:325) who postulated that a "typical Delphi panel has about eight and twelve members", while Phillips (2000:193) also informs that the optimum number of participation should be between seven and twelve members both citing the same reason as Linstone. De Leo (1995) emphasis that the number of panellist should be less than fifty; while Miller (1993) refers to the economics of scale in large groups of Delphi surveys. Miller assumes that beyond the first thirty responses, additional responses do not generate much new information. Similarly, Dunn (1994) suggests a ten to thirty participants, apprising that as the complexity of the policy issue increases, the sample size needs to be larger to include the entire range of participants both for and against the policy issue area. According to Andranovich (1995), if the group of experts is fairly homogeneous (sharing similar opinions) then ten to fifteen panellists will be enough and if there are diverse interests present among the experts, then the size of the group will need to be increased to ensure balance (Zami and Lee, 2009). Skulmoski, Hartman and Krahn (2007) highlighted a number of factors which should be considered in order to determine sample size for a Delphi technique: Heterogeneous or homogeneous sample (Delbeq et al., 1975); Decision quality/Delphi manageability trade off (Linstone, 2002); Internal or external verification. Therefore a sample size of 18 panellist was

adopted based on the following premise in conjunction with the qualifying criteria's as established in stage two of the Delphi study which are: Experts should have a fair and practical split between academics and practitioners; Panellist in both categories should have an extensive experience relating to general housing studies, low-income housing, or in other sustainable development or human settlement development context.

Regardless of the above criteria's', the current study also adopted Rowe, et al (1991) recommendations that the resultant selected participants should represent a wide variety of backgrounds to guarantee a wide base of knowledge and experience. The adopted experts' number of 18 seems appropriate, given the amount of data and subsequent analyses each panellist generates.

Stage 4 – Conducting the Delphi iterations

Sequences of questionnaire rounds are used to obtain iterative responses to issues in a Delphi study (Masser and Foley, 1987). For instance, Woudenberg (1991) propose two or ten rounds as appropriate numbers of rounds supporting that accuracy is expected to increase over rounds, because of the repetition of judgement and group pressures for conformity. Likewise, Critcher and Gladstone (1998) suggest between two and five rounds.

The Delphi study for the research consisted of three rounds. In average, each round took about a month to be completed. A questionnaire was designed for each round based on responses to the previous one. Round One questionnaire was designed based on a summary of the comprehensive review of literature highlighting sets of attributes and sub attributes that are potentially relevant to housing satisfaction decisions by the occupants of low-income housing. Additionally, issues relating to the provision of low-income housing, delivery and sustainability beyond the current level were also extracted from the reviewed literature. These were structurally and constructively put together to frame the first round of the Delphi survey. Closed and Open-ended questions were used in this round; thereafter, this was analysed and formed the basis of Round Two and Three of the study. Frequencies were obtained to measure the degree of consensus reached amongst participants regarding the attributes that determine residential satisfaction in South Africa low-income housing and for other related questions. Also, content analysis methodology was adopted to analyse responses to the open questions to "minimise redundancy" (Rubin et al., 1998:6).

The purpose of the second round of the study was to allow experts to review and comment on the attributes that determine housing satisfaction and other issues relating to low-income housing in South Africa, which were proposed by expert participants in Round One. Closed and opened questions were used in this round to investigate participant comments expressing agreement, disagreement or clarification concerning proposed attributes that determine housing satisfaction. The specific nature of the closed-ended questions stimulated participants' reactions. Frequencies were likewise obtained to measure the degree of consensus reached amongst participants. Also, content analysis approach was adopted to analyse responses to the open questions.

The final round three, was specifically aimed to: Inform the experts of the findings of the analysis of responses to the questionnaire of Round Two; Request their final affirmation / comments on attributes and issues that did not receive any consensus in Round Two. The questionnaire of Round Three was designed based on the findings of content analysis and measures of frequencies responses to the questionnaire of Round Two. Closed and opened questions were also used and frequencies were obtained to indicate consensus reached among experts regarding attributes that determine housing satisfaction and on other low-income housing issues as presented in the study. Where consensus was not research, the reason for the disagreement were noted and reported in the findings section of the study.

Over the three round Delphi survey, consensus was reached regarding most of the attributes that determine housing satisfaction and on other low-income housing related issues in South Africa. Based on the findings of the analyses of responses to the Delphi rounds, a list of attributes that determine housing satisfaction was prepared which informs the conceptual framework for the broader study, while issues surrounding low-income housing in South Africa were highlighted which responded accordingly to the set objective of the Delphi study. The Delphi survey was conducted via electronic mail, and follow-up emails were used to encourage prompt responses to the questionnaires.

CONCLUSION

The paper discussed the Delphi technique as an approved and credible research technique, with participants or expert panel members responding to a series of questionnaires (three rounds) to achieve a consensus in identifying the attributes that predict housing satisfaction in order to determine features that influence South Africa low-income housing satisfaction and other related housing issues in South Africa.

The technique was adopted as a preliminary investigation to the wider research to determine factors that predict housing satisfaction because it intended to remove the bias that is possible when diverse groups of experts meet together which is common with other method of decision making. Therefore, based on the premise of the outlined process, it is therefore recommended that when the Delphi technique is to be adopted as a research tool for housing studies, the questions for the experts should be well formulated because questions are vital to the whole process. It is also paramount that the panel of experts understand the broad context within which the questionnaire is designed. Also, in the selection of experts, stringent measures should be adopted that will not compromise the process. Likewise, in determining the panel size, it should be ensured that selected participants represent a wide variety of backgrounds to guarantee a wide base of knowledge and experience.

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