Q BOARD INTERVIEWS - AN EFFECTIVE METHOD TO RESEARCH USER OPINIONS

Tjamme Wiegers
Faculty of Industrial Design Engineering
Delft University of Technology
The Netherlands
T.Wiegers@Tudelft.nl

Clemens de Lange
Joris Vergeest
Faculty of Industrial Design Engineering
Delft University of Technology
The Netherlands
{ c.delange@hetnet.nl / C.J.M.deLange; J.S.M.Vergeest }@TUDelft.nl

ABSTRACT

Q board interviews can be applied as an effective method to get insight in the opinions of participants. Q board interviews form the interviewing part of Q methodology. Q methodology can be used to identify typical sets of opinions. However, in many studies, the research goal is to order opinions and see which ones play the most important roles, instead of identifying groups of people with similar opinions. In such cases, full Q methodology is not required. Yet, the Q board interviewing method has a number of characteristics that are also advantageous in such situations. Therefore, we decided to apply Q board interviews, although our goal was not to do factor analysis. With Q board interviews, participants order pre-formulated statements. Besides, participants are encouraged to provide background information. This enables them to bring in issues that go beyond the fixed set of statements. Because of this combination, Q board interviews stimulate engagement of the participants, without making the interview time consuming. The paper describes how Q board interviews were used by students of the course Social Cohesion Design and how the application of Q board interviews functioned as a preparation for applying Q methodology in the second stage of the course.

KEYWORDS

Research aspects in engineering, human and social aspects, opinion research, Q methodology, social cohesion design, participatory research

1. INTRODUCTION

This paper describes Q board interviews as a method to do user research for design projects or the course Social Cohesion Design. We adopted the way of interviewing, but not the analysis method of the Q methodology. First, the paper tells about the role of user research in the course Social Cohesion Design. Then it describes a number of possible interview methods and explains why Q methodology was adopted. Examples of the application of Q board interviews are described, for different stages of the course. A discussion of these applications will explain why we chose for the use of Q board interviews.

2. SOCIAL COHESION DESIGN

Social Cohesion Design is an elective course for third year bachelor students. It is given at the faculty of Industrial Design Engineering at the Delft University of Technology. However, the course is interdisciplinary; also students of other schools participate, including schools for Product Development, Art and Public Administration.

Figure 1 A participant is placing cards on a Q board
The goal of the course is to teach students that design is not only about products, users and stakeholders such as deliverers, and care takers. The course makes them aware that product design can influence all actors: all the people that are exposed to the product. These may be neighbours, friends and colleagues, but also casual passers-by. When we speak about a product, in this context, it is not necessarily a physical object; it may also be a service. Moreover, the result is not just a product. It is essential that it serves the community in the neighbourhood. Therefore, during the design, the introduction and the use of the product, there should communication with all people that are involved, e.g. users, municipalities and district coordination teams. The course Social Cohesion Design aims to make students aware of this and via the students also companies and institutions that are involved. Therefore, the result of a Social Cohesion Design project is not a bare product, but a Community Integrated Product System (CIPS).

The course is 7.5 ECTS and its duration is 10 weeks. Students work in interdisciplinary teams. Each team does a design project for a client. The client may be a company or an institute. Teams work independently on their projects and are coached by the teachers. The course is divided in three stages: Identification, Integration and Implantation. User research is relevant in all stages of the course. In the first stage, the problem situation has to be researched. Students investigate the setting, including all relevant objects, actors and events. Because the goal is to improve social cohesion, it is necessary to know what social interaction possibly occurs and how it can be improved. All students interview actors to investigate their needs and their opinions about the situation. After the identification of the problem, individual student teams develop scenarios that encourage social cohesion. They evaluate the scenarios and select the appropriate ones for further elaboration. In the next stage, the best scenarios are integrated into a final scenario. Then each team generates ideas for a product that supports their scenario. They approach actors again, to get feedback on their product idea. This time, the teams have to develop their own interviews, because the questions will depend on the product they design. The feedback of the actors will be used to develop the product idea into a concept. In the last stage, the concept is elaborated and the detailed concept is again shown to actors for feedback. Based on the feedback, improvements are made and the concept is finished. Summarizing, actor research is done in all three stages of the project. The first actors research is exploratory, to gain insight into the problem. It aims to gather opinions of actors about the situations. It will consist of questions of the type “What do you want to be improved?” and “What do you like to do for that?” The second actor research will still be exploratory; however, it will already be focussed on possible solution directions. The last actor research has an evaluative character. It will contain of a presentation of a possible solution, and ask questions of the type “Will this product encourage social cohesion?” and “Would you use this product?”

3. METHODS FOR OPINION RESEARCH

To investigate the opinions of actors, many research methods exist. In his book, Yount [20] mentions four types: the Likert Scale, the Thurstone Scale, the Q-methodology and the Semantic Differential.

The Likert Scale makes use of a list of statements that are related to a particular attitude. For each statement, the participant has to indicate in how far he agrees, by selecting one of a number of degrees that are presented. The degrees may be "Strongly agree", "Agree", "Disagree" and "Strongly disagree", but also other scales are possible. The Likert scale is often applied with five degrees. However, an odd number of degrees bears the risk that participants just tick the neutral value, instead of really thinking what their opinion is. The answers are valued, in the example case from 1 to 4. The highest value is for the answer that relates best to the researched attitude. If all questions are answered, the sum of the values indicates in how far the participant possesses the researched attitude.

The Thurstone Scale also contains statements. However, with this method the participant has to mark the statements he agrees with most. Each statement has a weight. The better a statement fits to the researched attitude, the higher is its weight. The sum of the weights of the selected statements is a measure for the occurrence of the attitude at the participant.

Within Q methodology, the statements are printed on cards. The participant is asked to sort the cards and place them on a board. The statements he agrees with most, should be placed fully right, the ones he disagrees with most should be positioned most left. The fields on the board are organized in a normal distribution, with few places for the extremes and more places for the more neutral opinions. When all cards are positioned, each statement gets the value of
the column in which it is placed. The results of a Q board interview do not tell in how far the participant has a particular attitude, but it tells which opinions are most important for him. A factor analysis is applied on the total set of results. The outcomes divide the participants in groups that reflect more or less a typical set of opinions.

A Semantic Differential test contains opposing adjective pairs, like long and short, or beautiful and ugly. Participants indicate the position between two opposing adjectives that matches the issue the test is about. The results of groups of participants can be compared to show the difference in the meaning they assign to the tested issue.

Creusen [6] studied consumer research methods and discusses twenty research methods. The results show that research methods for problem identification can deliver important, unique information or can be fast to conduct, but not at the same time. The only method that combines both characteristics is brainstorming with costumers for idea generation. However, brainstorming is not used as a method for problem identification. Most times, complaint analysis and interviews were applied for problem identification, and interviews and focus groups for assessments of consumer's motivation and values. Focus groups can unveil different types of insights into user attitudes and enable rich communication between participants and researchers; however, researchers need appropriate training to be able to moderate a focus group [4].

None of the companies in the above research mentioned Q methodology. It seems Robbins' statement is applicable, posing that "Q remains at best unknown and at worst misunderstood". Robbins [15] describes Q methodology as investigating subjective interpretation of social phenomena. It rank-orders opinions, but does not judge them. The presence of the researcher is important during the tests: it stimulates a participant to give background information and explain the meaning he personally assigns to the statement. With this possibility, Q methodology reckons with the fact that the meaning of a statement is not objectively defined, but depends on the participant's interpretation [2]. Researcher and participant collaborate to signify the research results. Dryzek [9] calls this "discursive democratization", while Cross [7] expresses it as "Q research always has the power to surprise". Several researchers performed studies in which Q methodology and Likert scales are compared. The Likert scale has the risk that respondents, if they are not eager to cooperate, easily choose the neutral value for many of their answers. With Q methodology, this risk is lower, because the Q board forces a specific distribution [7]. Ten Klooster compared Likert and Q methodology as image research instruments [18]. There was much similarity in the specific ranking per statement and also in the efforts of respondents. A problem of the Likert scale is the low number of respondents. For Q methodology, people are approached face-to-face and most of them are willing to collaborate. Many participants expressed they enjoyed the sorting of cards. Besides, the Q methodology requires a relatively low number of samples. Differences exist in the possibilities of interpretation. Q methodology is an effective means for exploratory research. However, methods such as Likert attitude questionnaires are necessary for quantitative studies. Hampson [12] did research on combined health risks and compared a Likert scale to a relative scale. He concludes that participants can indicate risk combinations better on a relative scale. No matter what method will be used, the difficulty of the questions should match the ability range of the participant. Otherwise, answers of participants may be too negative [5].

For the actor research in the course Social Cohesion Design, several requirements exist. First, the participants should be actively involved and have the opportunity to express opinions that were not yet foreseen. Besides, the research should be pleasant for the participants. Several researches will be done in the neighbourhood within only nine weeks, and we want to prevent that inhabitants get tired of the interviews. Next, it should be possible for the students to do research already in the first stage of the course, to gather opinions for exploring the project context and identifying problems. That means that the research method can be learned in a few days and also the method of analysis is not elaborate.

Focus groups give the participants many opportunities to raise issues that were not foreseen by the researchers. However, focus groups need quite some time for preparation, and that time is not available in the course, at least not in the first stage. Brainstorming combines nicely the delivery of unique information and with fast performance; however, brainstorming is in particular appropriate for idea generation, not for problem identification. From the comparisons between Q methodology and Likert scales, it appears that Q methodology is an interesting candidate. Q methodology differs from
the other methods because participants do not tick an answer; they arrange statement cards. Participants are encouraged to explain during the test why they place a card in a particular column. This gives the participant an opportunity to provide information that goes beyond the formulated statements. The participant's comments are in particular interesting for the statements he agrees or disagrees most with. Therefore, the experimenter will explicitly ask background information about the placing of these cards. This background information adds to the information that is got by observing in which columns the cards are placed. The experimenter can get more insight into what the participant moves to determine his opinion. Besides, working with cards gives the participant the opportunity to arrange and rearrange the cards until he is content about their places. For these reasons, Q board interviews were chosen as a method for opinion research within the course Social Cohesion Design.

4. Q METHODOLOGY

Q methodology was introduced by Stephenson [16]. For getting familiar with Q methodology, an introduction was written by Van Exel [19]. Ellingsen [11] mentions the following application areas of Q methodology: human geography, psychology, nursing, education, sociology, political science. Q has several advantages for opinion research. It makes people participants, not objects. It can deal with children, marginalized groups, and other groups for which participating in other research methods is difficult. Statements for Q methodology research are derived from the concourse. A concourse is the set of all possible statements about a context or a situation. The statements are opinions that people can utter, not objective facts [17]. Self-references are the preferred inputs for a Q sample [14]. Q methodology can identify different perceptions of the same issue. For example, Duenckmann [10] identified three distinct perceptions of rurality: an idyllic, a reform-oriented and an anti-conservationist view. By comparing the three views, new perspectives and insights were provided to the debate about social representations of rurality. The study of Liu [13] provides good insight in how the theory of Q methodology is applied in practice. Q methodology can also be used in combination with other methods. Three types of such combinations are discussed by Danielson [8]. Tradition is mentioned as the main reason that Q methodology is still in the background, compared to other research methods [14]. The goal of Q-

methodology is basically different from that of pure quantitative research; it studies why and how people believe something, not how many people do. Therefore, its results are not improved by increasing the number of participants [3].

5. EXAMPLE CASES

5.1. Case 1: Q board interviews for identification of the problem

The ‘Red Village’, a district in a residential area in Delft, was the context of the projects students worked on in the course Social Cohesion Design (Figure 2). In the Red Village, 1050 people reside, spread over 500 households. Many children live in the Red Village: 22% of the inhabitants is less than 15 years old.

For their projects, the student teams had to do opinion research in the Red Village. For this research they applied Q board interviews. In this section, we describe the Q board interviews performed by one of the teams. The team is called L’esCarGo and it had Vrijenban as its client. Vrijenban is a manufacturer of concrete products for city areas. Vrijenban supplied two assignments. One assignment was to design a community integrated product system for reducing the speed of cars in the district. The other one was an assignment for street furniture that stimulates people to meet each other. Similar to all other assignments, these assignments contained a social aspect. The goal was to design the products in such a way that people become better aware of each other and, as a consequence, reckon better with each other. Team L’esCarGo worked on both assignments.

Figure 2  The Red Village, a district in Delft.
For the general research they worked together, however, the design specific parts were performed separately, in two sub teams. The team performed Q board interviews in the main road in the Red Village. The test contained 23 statement cards about living in the Red Village. The Q board contains seven columns, as shown in Figure 3. As can be seen in this figure, the board contains two positions for the most agreed statements and two positions for the most disagreed statements.

The team visited 10 participants to do the Q board interviews. Each participant ordered the statement cards and placed them on the board. The statements were assigned the values that are written at the top of the column. Thus, the most agreed statements received value +3 and the most disagreed statements got value -3. These values were recorded. Besides, background information told by the participants was recorded. After all interviews were finished, the average value of each statement was calculated.

Other teams did the same in other sub areas. In this way, many participants could be approached in a short time. In total, 86 Q board interviews were performed. However, 15 results were delivered too late. Because of strict deadlines for the project deliveries, the calculation of the average results could not be postponed. Therefore, the analysis of the Q board interviews is based on the 69 interviews that were delivered in time. Table 1 shows the statements and their average value.

The team also calculated the averages of the Q board interviews that were performed in their own sub area. These values were compared the results to the averages of the whole Red Village, see Figure 4.

Compared to the whole red village, the inhabitants of the main street:

- Feel less need for a community centre
- Cope more with boredom
- Feel less that the municipality should make the district more pleasant
- Are more prepared to organize events
- Are less reluctant to pay for improvement
- Feel less that other people of Delft think the Red Village is an unpleasant district

Finally, as a preparation, the team members first did the test themselves. They did the ordering according to their expectations of what the opinions of the inhabitants would be. That enabled them to compare...
their expectations to what the inhabitants really thought.

In general, the expectations of the team were close to the average results of the inhabitants, Figure 4. However, in some cases, the strength of the opinions of the inhabitants was under estimated. For example, the inhabitants strongly believed that it was the responsibility of the municipality to make the area a pleasant and cozy, while the team placed this statement not before the tenth place. Furthermore, the boredom in the area was not as high as expected.

Also, the team expected that the inhabitants would have much contact with family and friends, but the inhabitants were rather neutral about this statement. On the contrary, they expressed that they would be happier if they would have more friends in the area. Another surprise was that the inhabitants indicated they would not sport more often if the municipality would install more sporting facilities. Inhabitants were not very eager to participate in organizing events. Finally, a community centre was rated much more important by the inhabitants than the team

Table 1 Results from the Q board interviews (average values).
expected. For the other statements, the expectations of the team were close to the opinions of the inhabitants.

Summarizing, it appears that the inhabitants of the Red Village think that their district should be more pleasant. Besides, they think that improvements should be initiated by the municipality or other institutes. They are not prepared to contribute much, neither by paying, nor by organizing. Yet they would like to have a community centre and a more pleasant district. They don’t have much contact with neighbours and would appreciate more face-to-face contact. The results of the inhabitants along the main street deviate from the results of the rest of the Red Village. The team used these results as indicators for the direction in which they had to find their solutions.

The results of this actor research show that the teams were able to gather information about the district from a large number of inhabitants, in a short time. This was partly possible because the participants experienced Q board interviews as a pleasant way of contributing. Instead of getting a list of questions that have to be answered behind a desk, the participants were actively involved, by ordering the statement cards to expressing their opinions. Besides, doing the Q board interviews was easy and didn’t require much organization. Apart from bachelor students, also students of intermediate vocational education were able to collaborate with performing the Q board interviews.

5.2. Case 2: Q board interviews for feedback on proposed solutions

The team analysed the problem, generated ideas and agreed a solution direction with the client. The solution direction of team consisted of two themes: stepping stones and collective gardening. The theme of stepping stones generates interaction between pedestrians and car drivers in the main street. The stepping stones are positioned at the kerbs of the street, protruding from the sidewalk into the street, Figure 5. They contain a series of led lights that will blink if a pedestrian walks on it. That will warn an approaching car driver. This makes the pedestrian more visible for the car driver, who will lower his speed anyway, because the stepping stones narrow the street. The blinking led lights will also be attractive for children and stimulate them to cross the street at that place. The stepping stones will stimulate people to cross the street at that place and thus

stimulate that people cross the street together, and may be start a talk.

The theme of collective gardening consists of a combination of planters and seats, Figure 6. The planters will be maintained by the inhabitants of the neighbourhood. The seats make it a meeting place at the same time.

After the solution direction was determined, it was possible to prepare interviews that were focussed on the specific solution direction, in contrast to the first interview. The statements of the first Q board interviews were general. They did not address a specific solution type and could be used by all teams. For this interview, the statements will be focussed on a particular type of solution and should be made by each team for their type of solution. So the team had to generate statements for the second Q board interviews. With this set of statements, they did a research in the neighbourhood. Five participants were interviewed. However, it appeared that heir was a flaw in the design of the statements. The statements were not balanced. Most of the statements were answered negatively. The Q methodology, however, is based on a normal division. Therefore, the participants could not properly place the cards in the

Figure 5  Stepping stones

Figure 6  Planters and seats

Q BOARD INTERVIEWS - AN EFFECTIVE METHOD TO RESEARCH USER OPINIONS
desired positions. The team reformulated the questions to achieve a proper balance. Then six other participants were approached to do the Q board interviews. This time, the sorting was no longer a problem. For Q board interviews, in principle, six participants is a sufficient count. A requirement is that these participants should be selected in such a way that they together form a good representation of the different types of people in the district. However, it was difficult to find a representative set of participants. For this research, the analysis was not restricted to a calculation of the average values; also the factors were determined. To support this, a spreadsheet was developed for analysing the Q board interviews. The spreadsheet is made in such a way that the students can easily input their data and see the results. There are three worksheets. The first one is for inputting the Q board interviews and observing the results. The students will mainly use this worksheet. They don’t need to know how the calculations are done. Therefore, the calculations are in a separate worksheet. The calculations in this worksheet are based on the description of Brown [1]. Finally, a third worksheet contains a comparison of the data of the different factors that are the result of the calculations. Students can, after they have seen the first results in the first worksheet, visit the third worksheet to get more details about the different factors. The input of the data is quite easy. The input sheet contains pictures of Q boards and the students can fill in the numbers of the cards that were placed on each position, Figure 7. After filling in all six Q board interviews, the calculations produced two factors. These factors are shown in the tables 1 and 2.

The factors differ in particular in their opinions about the statements 23, 10, 7 and 3. For Factor A, the neighbourhood is not safe enough to let children play alone in the street. Also, the neighbourhood is not attractive enough to go out for a walk, and a bicycle is not used very often. Factor B, however, does not bother at all when their children play in the street, uses the bicycle often and likes to walk in the neighbourhood.

The results show that the student team was able to perform Q board interviews, analyse them and describe the resulting factors. Initially, the team had a problem with its statement set. However, they corrected the statement set and repeated the Q board interviews. Finally, they received relevant results and they applied them to develop their ideas into detailed concepts (Figure 8). All related activities, starting from the generation of the statement set, up to the description of the characteristic features of the factors, could be done in about two weeks. Several ingredients of the course were necessary to make this possible. For example, all teams already practised Q board interviews in the first stage of the course. In the second stage, they learned also to generate the statement set and to analyse the factors. However, this was not too difficult because they were already familiar with the principles of the Q methodology and they had practiced already a part of it. Besides, analysing the factors was made easy for them by offering a spreadsheet that was especially designed for this purpose and could be filled very easily.
6. CONCLUSIONS

For the course Social Cohesion Design, a method was sought for performing actors research. The method should be easy to perform and stimulate the participants to actively engage in the research. Q methodology has the advantage of engaging participants in an active way, without making the interviewing process complicated or lengthy. The performance of the interview is not difficult. The experimenter can stimulate the participant to explain backgrounds of his choices and to bring in issues that were not foreseen. The analysis is easy as far as it concerns the rank ordering of opinions. The determination of factors, however, needs complex calculations. In the first stage of the Social Cohesion Design course, it appeared that the contribution of distinguishing factors was not indispensable. Therefore, for the first actor research we applied Q board interviews, however, without doing the factor analysis. Q board interviews make it possible to get insight in the opinions of the participants in cases where distinguishing of typical sets of opinions is not necessary. During the application of Q board interviews, we found a number of limitations. The Q methodology is meant for situations in which the experimenter and the participant can pay all their attention to the interview and can engage in a meaningful dialogue.
attention to the interview. It is often performed at a table or a desk. Our interviews were performed at the front door and in the street. In such situations, there is more chance that the participant is not really interested and probably inaccurate in ordering the statements. Bad weather may be another problem: strong wind may blow away the cards. One team applied Velcro to prevent this (Figure 9). Other possible solutions are magnetic cards or a tablet computer with a virtual Q board and virtual cards. A prototype of this was successfully tested. However, additional research is required to investigate if digitizing the Q board interviews influences the engagement of the participant.

REFERENCES


