

Research methods for online research on disability

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Abstract

Nowadays, the proportion of people who make daily use of the internet is growing rapidly. The benefits from this use are numerous; communication, exchanges, studies, businesses, marketing, access to information and knowledge, research are all considerably benefited. The present paper discusses how research on disability can be facilitated through the application of online research methods. It is concluded that it is important to adapt conventional research methods, both qualitative and quantitative, for online use, since it is an extremely time- and cost-effective way to reach the sample that is representative of the general population and to collect and analyze the data. The most important contribution of online research is that it provides the opportunity to recruit participants -people with disabilities- from anywhere in the world and gain an international perspective for the study. The appropriateness of using a range of different types of online communication, such as Collaborative Virtual Environments, for the purpose of qualitative research is also discussed and their potential of conveying non-verbal information is assessed.

Key-words: online research, disabilities, quantitative research, qualitative research, Virtual Environments

Introduction

Over the last years the internet has become one of the main media for communication, finding information, conducting business and marketing. Considering the increasingly large role it plays in our lives, the benefits of using it for online research are obvious. It is an extremely time- and cost-effective method, and due to the fact that proportion of people with internet access, as well as the proportion of people who report using the internet everyday has increased significantly over the last few years [1] it has become possible to conduct online research and have a sample that is representative of the general population.

Research on disability has become a pressing issue as the incidence of disability is expected to rise in the next years. In 2000 the European Parliament reported an estimated 11% of the EU population to be disabled [2]. This figure was predicted to rise to 18% by 2020 [3] but has already reached 16% [4]. With the disability incidence on the rise, it is important to find ways to improve the quality of life of those with special needs and enable them to live a life as independent and autonomous as possible. Allowing people with disabilities to be

excluded from the society and accepting that there are certain aspects of life that are inaccessible to them is not a solution and can no longer be accepted.

This article will identify some of the problems faced when conducting online research on disability and discuss the possibility of using methods and tools used from other disciplines – Market Research and Distance Learning – in order to address these issues. There are several advantages of conducting online research on disability and research in general and so it is important to adapt conventional research methods and tools for online use. Firstly, online research provides the opportunity to recruit participants from anywhere in the world and gain an international perspective for the study. Second, many disabled people cannot easily travel anywhere by themselves and using public transport is not always a possibility as not all modes of public transport are completely accessible to people with disabilities. Reaching these people online, therefore, is a way to reach participants who would not be willing to travel to the research centre or are housebound and would not otherwise participate in the research. If these groups of participants who have mobility problems do not take part in the study, then an important category of the disabled population would be excluded from the study, resulting in biased findings [5]. Recruiting participants online is a way to include these people in the study thus ensuring a more representative sample. Third, it is a cost-effective method because it cuts down the cost and time needed to enter and analyse data, as the data collected can be automatically entered into the system in an electronic form. Conducting research online can also cut down the costs needed for data collection – if, for example, a study involves sending participants questionnaires via post, emailing questionnaires can cut down the costs of printing and posting the questionnaires.

The benefits of conducting online research are obvious, but adapting conventional research methods for online use is not always straightforward. Qualitative research methods pose a bigger problem than quantitative methods, since the former rely heavily on the quality of the communication between the participant and the researcher [5]. Qualitative methods, such as in-depth, one-to-one interviews and focus groups are used to explore the ideas and beliefs of participants, and often focus on sensitive issues. It is important that the participants feel comfortable which will allow them to disclose information that might be personal or sensitive. The quality of the communication and interaction between people is affected in large part by body language and non-verbal communication in general [6 7 8 9], something which is absent in virtual interactions. The absence of non-verbal communication can have a detrimental effect on the communication between the researcher and the participant, meaning that the researcher may not be able to collect as much information as they would have in a face-to-face environment. Indeed, it was observed that when non-verbal cues were absent from a text-based virtual interaction, conversations between participants were shorter and more chaotic than when the participants were asked to communicate non-verbal information using their avatars [10]. This highlights the importance of finding a way to enable individuals to exchange non-verbal in addition to verbal information, so that the quality of the interaction and the study findings do not suffer when transferred to a virtual environment. This article will discuss the appropriateness of using a range of different types of online communication for the purpose of qualitative research, and assess their potential of conveying non-verbal information.

Quantitative research methods are relatively simpler to conduct online, yet there is still potential to facilitate and improve the procedures used further. Online research is particularly popular and widely used in the area of Market Research (MR), especially since consumers are spending so much of their time online: online shopping has become an everyday habit (or even an obsession, for some) among consumers. Nowadays one will be hard-pressed to find an MR agency that does not offer online research services. As the use of online research is so widespread in Market Research, there is a lot to gain by looking into more detail at the tools and methods used by MR professionals in online research.

Participant recruitment

In addition to conventional methods, online research opens the possibility for more ways to contact and recruit participants. In research on disability, for example, participants can be recruited by contacting them directly via e-mail, by advertising on websites that are directed especially towards people who have a disability such as specialised discussion forums, or by directly embedding the survey that is to be completed by the participants on such websites. The latter is made possible by research software packages, such as Conconfirm, which will be discussed in more detail in the next section.

One important issue that researchers face when recruiting participants who have a disability is the fact that for some patients it is difficult to travel on their own, while some are even housebound. Because of this, if a study requires the participants to visit the research centre, many of them will not be willing to participate, limiting the sample size and introducing a possible selection bias, thus compromising the validity of the findings. When one of the main characteristics of the target population is limited mobility, as is the case in disability research, it is possible to employ other methods of data collection that do not involve the participants travelling to the research centre. For example, the researchers may either visit participants in their home, collect the necessary data by sending them a self-administered questionnaire, or by conducting a telephone interview. These methods are a useful solution when a participant cannot get to the research centre; however, they have certain

drawbacks. Visiting each participant at home is expensive and time-consuming, while the postal method has a low response rate, which may introduce a selection bias.

Conducting research on disability online is a cost- and time-effective solution to the above problems. It provides researchers with the possibility of contacting participants and obtaining data without the need for either the participant or the researcher/interviewer to travel, thus reducing the cost of the study. Additionally, online surveys can be completed in the participant's own time, whenever it suits them, unlike with telephone interviews where the participant may be caught off-guard and not be willing to complete the interview. The surveys can be completed and sent online, requiring minimal effort on the part of the participant, as opposed to the postal method, which would require the participant to go out and post the questionnaire themselves. Finally, the information from the online surveys is automatically entered in the computer meaning that there is no need for data entering and handling, saving a significant amount of time and money.

One important issue to consider with online research on disability is that individuals who are computer-illiterate cannot participate in the study leading to a selection bias. However, according to the data published by the UK Office for National Statistics, which show a constant increase in internet use over the last years, the problem of computer illiteracy is gradually and steadily decreasing and internet use is becoming an everyday habit for the majority of the UK population – 73% of those interviewed reported that they use the internet everyday or almost every day. In 2009, 70% of households in the UK had Internet access, representing an increase of 1.85 million households since the previous year [1]. The youngest age group showed the highest rate of Internet use, with 96% of people between the ages of 16 and 24 using the internet, while 52% of the 65+ age group reported everyday use of the Internet. Access has increased from 2008 to 2009 in all age groups and while the youngest group showed an increase of 3% over the previous year, the largest increase was seen in the oldest age group, those aged 65 and over, with an increase of 15%. These data suggest that internet use is rapidly becoming an everyday habit for individuals of all ages and, although the problem of computer illiteracy still exists, it is steadily decreasing.

One final issue to consider regarding participant recruitment in disability research is the fact that certain types of disability may limit people's ability to use the Internet. When designing a research study it is important to take into consideration the functional abilities of the target population. For example, including sound cues or audio information in procedure may automatically exclude participants with hearing difficulties or using a procedure that requires a high level of dexterity may exclude participants with partial or whole paralysis. It is important when designing a study to design it in such a way that it does not exclude certain groups of the target population.

Quantitative research

One of the most popular software packages in MR for online research is Conconfirm. This is a leading software provider for Market Research and Enterprise Feedback Management. The latest version of Conconfirm is Conconfirm Horizons which has been developed using 30 years' knowledge and experience of customers' requirements. The software package provides support to researchers in collecting continuous feedback data, managing participant databases and panels, while it can also help with data processing, analysis and the reporting of findings. This software package can be used to support a wide range of data collection methods, used in online research, including Web interviewing, Computer Assisted Personal Interviewing (CAPI), Computer Assisted Telephone Interviewing (CATI) and a range of offline methods. Conconfirm allows the possibility to complete more projects simultaneously in less time, gather more reliable results and recruit participants from several countries, therefore gaining an international perspective in the study.

Conconfirm can be used to improve online research on disability and in general by helping deal with some of the problems associated to data collection methods. For example, one of the most popular methods for online market research is the use of questionnaires. These are easy and quick to complete and respondents can do them in their own time, in any place that is convenient to them. However, there are certain disadvantages about using self-administered questionnaires: if a question or the instructions are not clear, then participants may give inaccurate or incomplete answers, while it is common for questionnaires to be left unfinished if they are too long or too complex [5]. Researchers must therefore be careful when designing a questionnaire to make it as simple and easy to complete as possible. Conconfirm can help researchers design superior online surveys with minimal training, that are easy to use, straight-forward and simple to complete, while ensuring that the interest of the respondents remains intact throughout the survey, thus maximizing the number of participants who will complete the questionnaire.

In addition to data collection Conconfirm can also be extremely useful in participant recruitment. Conconfirm Horizons has the 'Survey Widget', a useful application that allows researchers to embed surveys into 3rd party websites. This is a useful feature, as it helps target and approach the right participants. The researchers can embed their survey in websites that appeal most to, or are visited most by, the target population. This can ensure that the most appropriate participants are recruited. For example, in the case of an online survey where the target population are disabled people, the questionnaire can be embedded in a discussion forum directed to

people with disabilities. One more important application of Confermit is the Confermit Kiosk. This is an additional feature of Confermit, which allows researchers to interact with respondents via target locations including various public places, such as transport centers, stores or hotels.

Qualitative research

Popular as the above quantitative methods are, there are instances they cannot be used and the problem of reaching participants with mobility problems remains unsolved. Some research designs use one-to-one, in-depth interviews or focus groups to collect data. These methods are useful when the objective is to understand and obtain detailed information about the ideas, opinions and attitudes held by an individual or a group of people.

It is important to find a way to adapt qualitative research methods for online use, as there are numerous advantages to using interviewer-administered data collection methods over self-report methods. There are situations where a one-to-one interview administered by a trained interviewer is more appropriate than a questionnaire: self-administered questionnaires must be kept as straight-forward and as simple as possible in order to minimise the chance that a participant will abandon the questionnaire before completing it. The human interaction and the relationship between the interviewer and the participant that develops in a one-to-one interaction allow for the interview to be longer, and more complex [5]. They are particularly useful for when the objective of the study is to obtain detailed information and explore a person's beliefs, opinions, feelings and attitudes. Additionally, with self-administered questionnaires, there is the possibility that the respondents may not understand the questions, thus leaving some of them unanswered or giving inaccurate answers. An interviewer can make sure that the participant understands the questions and that their responses are as accurate and as complete as possible. In other cases, a study can benefit from a focus group where participants get together, express their opinions on a subject and elaborate their thoughts each building up on what other people have said thus taking the conversation to a deeper level.

The disadvantages associated with face-to-face interviews include the high cost of having participants visit the research centre, or the cost of the interviewers visiting participants individually in their homes. Another disadvantage of these methods is the fact that the participants cannot keep their anonymity as would be the case with self-report methods, which may inhibit participants from disclosing personal information on sensitive issues such as sexual behaviour or drug-taking. As the qualitative methods are often used to explore sensitive issues, it is always important for the interviewer to establish a good rapport with the participant from the beginning of the interview, in order to allow them to disclose personal information. The interviewer can achieve this not only through what they say, but also through their body language, which affects to a great extent the quality of the communication between two people.

When people interact, they exchange information in many different forms that go beyond verbal speech, and these include hand gestures, body movement and posture. According to Reena [11], 60-80% of the information humans communicate to one another is through their body-language, and only 7-10% is communicated through spoken words. Short et al. [12] suggest that non-verbal communication in human interactions can be categorised into 3 groups, all of which are important in the expression of attitude, emotions and sentiments: the first group refers to non-verbal and non-vocal information, such as hand gestures, body posture and eye contact. Open hand gestures make people seem honest and approachable while body posture can convey an individual's interest and attentiveness in a situation. Additionally, maintaining healthy eye contact shows respect towards the other person and interest in what they are saying [11]. The second category refers to vocal but non-verbal communication, such as the volume or intonation of voice. Finally, the third category includes general non-verbal information such as clothing and appearance.

Body language has a significant effect on the quality of the communication between people, regardless of the fact that it usually occurs unconsciously, without an effort on the part of the individual. Merola and Poggi [6] and Roth [7] explain how non-verbal communication affects the quality of an interpersonal interaction: first of all, non-verbal signals are important in ensuring the smooth flow of the conversation and by regulating turn-taking in speaking. Redfern and Naughton [13] agree with this, and suggest that facial expressions are particularly important in regulating turn-taking. They also suggest that facial expressions are useful for expressing one's agreement or disagreement to what the other person is saying and their understanding or their confusion to what has been said. Additionally, a person's eye gaze demonstrates the focus of their attention, and it is used for initiating and even ending a conversation. Walther [8] explains that the lack of non-verbal cues in virtual interactions has a significant depersonalising effect on the quality of the communication between people. Furthermore, Anderson et al. [9] suggests that the lack of physical presence and body language input results in a decreased motivation of people to participate in the conversation and their decreased involvement.

It is obvious, therefore, that non-verbal information contributes significantly to the quality of the communication between people, and its absence is especially important when it comes to the conduction of in-depth, one-to-one interviews and focus groups. Online communication does not allow for these important aspects of non-verbal interaction to take place. Interactions that occur in a virtual environment are often limited to

written speech and lack this multi-dimensional aspect of communication [14]. When two people interact online, it is in most cases impossible for them to see each other's facial expressions, the direction of their eye gaze, or the tone of their voice, the way they sit across from each other and their body posture. There is also no feedback available regarding the interest of the other person in the conversation and their focus of attention. All of these sources of information help illustrate and strengthen a verbal message, and as they are absent in online communication, the underlying emotional context of the interaction may be not understood or communicated between the people.

Adapting qualitative research methods for online use poses a problem, as most of the popular and widely used methods of online communication do not allow for adequate exchange of non-verbal information. Since the quality of the data collected depends on the quality of the relationship developed between the participant and the interviewer [5] this is an important issue that needs to be resolved. When attempting to transfer a face-to-face interview or even a focus group to a virtual environment, it is possible to employ one of the most popular types of online communication. These include text-based computer-mediated communication, such as instant messaging services and online chatrooms. There is also the possibility for video calls using suitable programmes such as Skype, while teleconferencing and videoconferencing, often used to conduct business meetings can be used to conduct focus groups, when the contribution of more than two people is required.

Unfortunately, none of these ways of online communication allow for adequate exchange of non-verbal information. Text-based computer-mediated communication is one-dimensional, only allowing the expression of ideas and emotions through text. When people interact online they have the potential to exchange certain non-verbal information through punctuation marks and emoticons [15 16]. However, there is no way to display any other form of non-verbal cues which in real-life interaction are considerably more elaborate than what the emoticons can communicate.

The solution of conducting focus groups via teleconferencing or videoconferencing is interesting, as it is a convenient and cost-effective solution, allowing for a larger number of focus groups, and the recruitment of participants who live in a great distance from the research centre, and would be difficult to recruit otherwise. When conducting focus groups, it is extremely important for the people to develop a friendly and comfortable rapport between them. The content that emerges from each focus group is heavily influenced by the interaction between the members and the dynamics that develop within the group [5]. It is important therefore, when conducting a focus group online to find a way to enable these dynamics to develop. Teleconferencing and videoconferencing are two possible ways to organise a focus group involving participants who are geographically distant from each other. However, many of the important non-verbal cues mentioned above are absent when using these media. It is not possible to see other people's gaze direction, spatial presence or activity within the group. It is not possible with teleconferencing or even video conferencing to give participants a sense of existing together in a shared space and therefore it is hard to create a feeling of shared activity and of co-existing [13]. Allmendinger [17] suggests that the absence of non-verbal signals has a detrimental effect on the participants' involvement and motivation to participate in the discussion. At the same time the communication between the individuals may not be as smooth and regulating turn-taking becomes harder when the participants cannot look at each other. The job of the group facilitator or co-ordinator becomes especially difficult, as it is hard to know when someone wants to speak or has something to contribute. The non-verbal signals that show someone's agreement or disagreement to other people's statements which would help the co-ordinator take the conversation to a deeper level – and extract important ideas, attitudes and beliefs – are absent.

Anderson et al. [9] conducted a study to identify the most important steps that need to be taken into account in order to improve the quality of the communication in teleconferences and videoconferences. They propose that one of the main requirements in order to improve communication in such instances is to have animated avatars assigned to each one of the participants, which would help individuals in the group understand the identity of the speaker and identify the person that is talking in each instance. It is usual for participants in a focus group to have never met each other before and in a virtual meeting they would not be able to understand who is speaking, who they are talking to, and what they are saying. This would make creating an image for each speaker and developing a connection with them even harder. The second requirement refers to the participants having more flexibility and freedom in turn-taking. In other words, participants benefit from having the ability to express their wish to speak. Without the ability to do this, some individuals may find it difficult to jump in the conversation and draw attention to themselves while other people are speaking, resulting in these individuals speaking less than the others – this means that valuable information from many participants may be lost. In a conventional focus group where people are sitting in a room facing each other, anyone can raise their hand, stand up straight, or take a deep breath to indicate that they have something to say. This is not possible in a virtual environment or teleconference communication. Thus, Anderson et al. (2001) identified that participants would benefit from having the ability to 'flag' their avatar when they wish to speak, ensuring regular turn-taking and a smoother conversation. The third suggestion made by Anderson et al. (2001) refers to the benefits of having the

ability to make certain symbolic actions or gestures, as a way for an individual to express their agreement or disagreement to the contribution of another member.

Collaborative Virtual Environments:

One possible solution to lack of non-verbal communication in a virtual environment is to use Collaborative Virtual Environments (CVEs) as a medium for communication. CVEs are computer-mediated, virtual spaces or places where people can communicate and interact with others [13]. Users in CVEs are represented as avatars, which are visual representations of an individual's virtual identity. CVEs are particularly popular for distance learning, allowing the use of creative and effective teaching methods [13 18]. They are suitable for a range of different activities, including debates, discussion groups, project work, brainstorming sessions and role-playing. They have recently gained a lot of popularity as mediums for online communication [19]. CVEs enable interaction with individuals who are geographically distant from each other and are structured in such a way that they encourage a sense of social presence that is superior to that experienced in any of the other types of online communication described here [20]. Due to the fact that they are particularly appropriate for group discussions and brainstorming sessions, and the fact that they enable interaction between individuals who may be far away from each other, CVE can be an extremely useful tool for the conduction of focus groups in online research on disability.

Collaborative Virtual Environments allow for the exchange of non-verbal information to a larger extent than other online communication media, thus improving many of the problems created by the lack of non-verbal cues described previously. One of the key areas where CVEs are superior to other forms of online communication is the fact that they are constructed in such a way that it is possible for participants to get the feeling of being in the same space as the others. By placing the participants' avatars in proximity to one another, it is possible to convey a sense of spatial proximity and shared space, that can make participants feel a connection to one another. The feeling of being in the same space with another person in a virtual environment is described by the term 'social presence' and according to Allmendinger [17], it is one of the most important factors influencing the quality of online communication. Even a graphically simple avatar can be placed in relation to other avatars, thus expressing the focus of attention of the participant. This can help group members become more aware of others, their position and focus of attention. Becker and Mark [10] identify the sense of being in the same geographical place with others as one of the preconditions for creating a community, a precondition which is often ignored when creating an online community. However, CVEs provide the opportunity to create a strong sense of location, which can significantly affect the dynamics of the group interactions [13], and help maintain a high quality in the data collected during a focus group.

Becker and Mark [10] conducted an experiment that demonstrated the improvement in the quality of communication brought about by the use of avatars to represent spatial proximity. When participants in a CVE had to place their avatars close to that of the person to whom they wished to speak, both participants felt a stronger sense of obligation to converse with each other. Without this requirement, the conversations recorded were more chaotic and shorter. Based on these findings, it appears that the use of avatars in the way described above improves the quality of the conversation and the exchange of larger volumes of information, since it encourages participants to converse for longer periods in a more structured manner. This is a property particularly desired in focus groups, which benefit greatly from the exchange of rich and structured information.

In CVEs it is also possible to customise their avatars as a way to express themselves and develop a unique identity. Avatars can be customised and take the form of an animal, an object, a human or a fantastic creature. This can intrigue individuals' interest in one another and influence the perception that one person has of another [21 22 23], which encourages sociability among the participants, and the development of a community [24]. In addition to the use of avatars, which, in general, support communication by aiding with the identification of each participant, by helping regulate turn-taking and enhancing social presence, there are other tools that can be used to communicate non-verbal information. Examples include using cybergloves to track hand gestures [23] or employing a predetermined repertoire of non-verbal cues which the participants can activate themselves using either the mouse or keyboard [25 15]. Unlike these last tools for expressing non-verbal information which must be consciously activated by the participants, certain CVEs offer the possibility of non-verbal signals that are automatically activated by the system. These signals are called "liveliness signals" and include blinking of the eyes or breathing [9 26]. Overall, CVEs can be adapted according to the requirements of the users and can be extremely versatile, which makes them particularly appropriate for research use, as they can be customised according to the needs of each different research study.

Conclusion

There are numerous benefits to conducting online research and especially in a subject where the target population is often unable to participate due to an inability to travel to the research centre when conventional methods are used. There is great potential to using online research methods, especially since internet use is becoming an everyday habit for a continuously increasing number of people [1].

Self-administered questionnaires allow participants to keep their anonymity, which may allow them to be more honest with their answers. On the other hand, the personal interaction in face-to-face interviews and focus groups encourage a relationship to develop between the participants and researchers which is also important for the disclosure of personal beliefs and ideas. Considering that it is possible using Collaborative Virtual Environments, to facilitate the exchange of non-verbal, as well as verbal information in a virtual setting, then conducting research online will combine the best of both worlds allowing participants to remain anonymous, yet allowing them to experience a personal connection to the person they are talking to. In order to ensure that the quality of online communication does not suffer from the lack of non-verbal information, it is important to ensure that certain requirements are fulfilled. First of all, it is important that participants are able to use their avatars to express the focus of their attention, their agreement or disagreement to another person's opinion or their confusion at something that has been said. It is also important for users to be able to 'flag' their avatar when they wish to speak, so that there everyone is given the chance to contribute to the discussion if they wish. It is also important that participants get a sense of shared space and common location by being able to see their avatars placed in a shared virtual space in relation to one another. Finally, it is useful when avatars can be customised so that they can express a participant's unique identity, in order to help participants identify each other and develop a connection.

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