Teenagers Talking About Energy: Using Narrative Methods to Inform Design

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Abstract

This paper explores teenagers' attitudes towards energy consumption. The research is part of a wider project with the goal of designing, developing and evaluating mobile solutions to change teenagers' attitudes and behaviour towards energy. Diaries, stories, written scenarios and focus groups provided initial insight into teenagers' attitudes. The use of multiple methods engaged teenagers in the project and resulted in data that was rich in detail and context. Initial themes that emerged for the data were: type of energy used, impact of energy use, sources of information, location and green teens. Findings will inform the design of mobile solutions for teenagers and help in the development of a behavioural change programme.

Author Keywords

Teenagers; design; attitude

ACM Classification Keywords

J.4 [Social and behavioral sciences]: Psychology;

General Terms

Design

Introduction

Worldwide concern with regard to energy consumption is increasing. For example, in 2009 to 2010 the UK witnessed a 13% rise in domestic energy use. Energy use in the home is seen to be 'invisible to the user' [5] with electricity being 'abstract' and 'untouchable' [7]. Research exploring understanding of electricity through drawings indicated people were relatively unaware of how much appliances within the home used [3].

Despite this, there is general understanding of the need to save energy and people are aware of the consequences of not doing so. People save energy due to economical costs and environmental concern. According to [9], even though consumers have positive attitudes towards sustainability, this attitude alone is not enough to impact upon actual behaviour change. Consumers interact and use energy-consuming systems without conscious consideration of the impact on the environment [12].

The majority of previous research has focused on adult or household energy saving attitudes and behaviour. We are interested in teenagers noting they 'are the adult consumers of tomorrow' [8]. Teenagers are known to influence their parents about environmental issues with nearly a quarter of adults rating their children as the main influence for social and environmental matters [11]. There is little known about how teenagers use energy and their attitudes towards energy, energy saving and the environment [1].

This paper describes how the HCI and design communities can benefit from the use of multiple methods that engage participants. The methods provided insight into teenagers' attitudes and actual behaviour regarding energy use. This part of the three year project will feed into the design of an mobile energy saving device and a behaviour change programme. The work highlights design ideas that need to be considered when developing devices for the teenage population.

Method

This project involved two stages. Stage one involved diaries and stories, and stage two involved focus groups using written scenarios. Crivello, Camfield and Woodhead [4] noted that multiple data collection methods can keep teenagers interested in the research, appeal to teenagers' different preferences and provide data triangulation.

Participants

Schools and organisations were recruited to take part in the research from across the North East of England. The teenage participants were selected by their school or organisation. Over 90 teenagers participated and were aged between 10 to 19 years old from nine schools and organisations.

Diaries

Teenagers were each provided with an A4 paper diary to record over a seven day period all the energy gadgets and appliances they used. The diaries were structured and required the teenager to list the time, what they did, what they used and the length of time they used it for. The meaning of energy use was not specified and in response to any questions about what to include within the diaries, teenagers were asked to decide themselves about what to record and were told that there were no right or wrong answers.

Sixty diaries were collected and the majority were rich in detail and complete. The diaries enabled teenagers to record their energy use over seven days and subsequently use this information as a prompt for the following story activity. They also provided insight into teenagers' views towards and uses of energy.

Stories
After completing the diaries, teenagers were invited to a story session approximately one to two weeks later. At this session teenagers were instructed to use their diaries as prompts (if needed) to help document how they use energy on a typical week day and weekend. A range of materials were provided including paper, pens, pencils, coloured felt tip pens, glue and catalogues. Teenagers could select how and which materials they used. Teenagers could write, draw, cut out pictures or use a combination of these approaches. Again, the meaning of energy use was not specified and teenagers selected what to include within their own story. The length of this story activity ranged from approximately 30 to 60 minutes. 96 stories were collected.

Initial Analysis of the Diaries and Stories
The diaries and stories were independently analysed by five members of staff with relevant experiences in qualitative analysis from Northumbria University, including two members of the research team. This enabled multiple views of the data to be gathered. All staff met and employed a constant comparison analysis to ensure that the thematic analysis represented all perspectives. Discrepancies between coders were resolved through discussion and mutual agreement.

The purpose of this analysis was to identify initial themes about teenagers' attitudes and use of energy.

Themes emerged about the types of energy and devices used and also the different locations of energy use. This data analysis was used to develop written scenarios which depicted how teenagers use energy. The scenarios were based on teenagers' own experiences and knowledge and used within focus groups as prompts. Separate scenarios were developed for senior and junior teenagers due to differences emerging between the two age groups. Each scenario consisted of good and bad uses of energy in order to create discussion around which scenario was similar to the teenagers' own energy use.

Focus Groups
Focus groups were conducted to further explore teenagers' attitudes towards energy. Scenarios for the relevant age group were read aloud at the beginning of each focus group to help break the ice and to help participants feel more comfortable [10]. The scenarios also helped further explore attitudes towards energy, energy saving and devices to monitor energy use. The focus groups lasted from approximately 25 to 60 minutes.

This paper reports findings from three focus groups with junior teenagers (aged 10 to 15 years). The size of the groups ranged from four to seven teenagers, with four males and twelve females.

Analysis
Diaries and stories were firstly analysed separately and then together using thematic analysis [2]. The focus groups were transcribed verbatim and again analysed using thematic analysis. NVivo 9 software was used to organise the analysis. Subsequently, the data and analysis from the diaries, stories and focus groups were

brought together to identify the themes about teenagers' attitudes towards energy consumption.

Results

Several themes emerged during the thematic analysis of the data (diaries, stories, focus group transcripts). These were: type of energy used; locations of energy use; sources of information; impact of energy use and green teens.

Type of Energy Used
The types of energy teenagers use was highlighted within the diaries, stories and focus groups. As the meaning of energy was not defined by the researchers this enabled the teenagers to interpret the term themselves. This also provided insight into the types of energy teenagers use and their views about energy.

The diaries and stories from the senior teenagers tended to focus upon electrical energy while junior teenagers a wider range of energy types. Furthermore, in the focus groups junior teens highlighted different types of energy were missing from the scenarios in relation to their own energy use including lights, transport and water.

Teenagers discussed within the focus groups 'how' they use appliances. Differences between teenagers emerged with some using the standby option, some turning appliances off and some leaving appliances plugged in at wall: *"…I just leave everything on standby I just don't turn anything off"* (Junior teen, female).

Location of Energy Use
Teenagers varied regarding the locations of their energy use within the stories and diaries. Junior

teenagers tended to focus on activities and appliances which used energy within the home and/or school with some other locations mentioned. Senior teenagers focused upon energy use in the home with many household and personal appliances incorporated with little mention of energy use at other locations.

Discussions explored the locations of energy use further. The researcher asked teenagers about 'where' and 'what' they classify as their energy use. Energy used at school was not considered as their own: *"what I turned on"* (Junior teen, male); *"stuff that you actually use"* (Junior teen, female).

Sources of Information
A variety of sources of information about energy use and energy saving were discussed by teenagers within the focus groups including the media, adverts, general knowledge and school lessons. These sources do affect teenagers' awareness of the impact of energy use. Also, these sources could be related to whether or not teenagers are concerned about energy use and saving.

Impact of Energy Use
Teenagers discussed the impact of energy use in terms of the environmental impact (e.g. global warming), future generations (depletion of energy resources) and personal cost (responsibility). The impact of energy use links to sources of information, e.g. parents talking about cost. Cost was a key issue discussed by teenagers. Some teenagers viewed adults to be more concerned about energy saving due to the costs involved and being responsible for paying the bills:

"I don't think when you're a teenager you really worry about it you don't really think about it it's usually adults

cos they do all the paying the bills for energy" (Junior teen, female)

Not all teenagers were in agreement as some described how parents restrict energy use in their home to save money.

Green Teens
This refers to the level of concern teenagers had about saving energy with mixed views raised by teenagers within the focus groups: *"You don't care it's not one of your problems"* (Junior teen, male).

Age was raised during one focus group as having a possible effect upon teenagers' attitudes towards energy and energy saving. There were mixed views about which age group (younger or older teenagers) use more energy. It was also suggested that energy saving was more important to younger teenagers.

Teenagers discussed ways to save energy. Also some teenagers had an awareness of devices developed by energy companies to monitor energy use, although they were not currently using them.

Thematic Map
Figure 1 provides a suggested thematic map of these themes. This work is exploratory and further focus groups will explore these themes further.

Teenagers' design ideas
Ideas were briefly discussed for the design, display and functions of a device for teenagers which informs them about their energy use. These included something in the home and something small to wear/carry. There were some reservations about wearing a device that
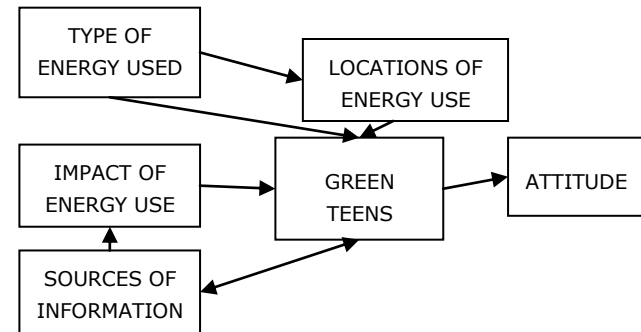

Figure 1. Suggested thematic map.

was visible as this was considered 'uncool' and embarrassing as others would know you were saving energy. The possibility of an app was also raised although teenagers recognised that this may not be accessible by all. Ideas about the display included showing how much energy has been used, the cost of the energy, how much has been saved and the possibility of using traffic light colours. The functions of the device included enabling comparison of energy use between months, weeks and days, providing a limit of energy use after which appliances would turn off and including how to improve your energy use/ energy saving.

Discussion and Conclusions
We have provided an exploratory analysis into teenagers' attitudes towards energy use. This paper details the findings from diaries, stories and three focus groups. Initial themes and a thematic map have been produced. Focus groups with senior teenagers and an additional focus group with junior teenagers have been completed and yet to be analysed. The analysis from all the focus groups will lead to further insights into teenagers' attitudes and enable comparisons to be made between age and gender.

In addition, this work highlights how multiple data collection methods engaged teenagers and produced data that was rich in detail. The combination of methods emerged teenagers in this project and teenagers commented that they enjoyed taking part in this research. Different materials and ways were selected by teenagers to document their stories demonstrating the importance of providing teenagers with different options. Previous research with children [6] highlighted that the use of multiple methods leads to greater understanding rather than identical data. This can be seen in this project with the different data collection methods adding valuable insights into this topic, for example the diaries provided data about energy use over a typical week whereas the focus groups enabled the exploration of views and attitudes.

This work will inform the future stages of the project to further explore teenagers' attitudes including the development of an online interactive questionnaire designed for teenagers. Guidelines will be developed to feed into the design and development of mobile solutions for teenagers to help reduce their energy use.

Acknowledgements

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