



UNIVERSITY OF LEEDS



**SOCIO-TECHNICAL
CENTRE**

PUTTING PEOPLE AT THE HEART OF DESIGN

Energy Efficient Behaviour Change in Schools

Participant Research Summary
December 2016 / Version 1.4

**Dr Matthew Davis, Lauren Machon,
Prof. Kerrie Unsworth & Dr Mark
Robinson**

1. Background

This research was fully funded by British Gas Trading Limited and conducted on behalf of the University of Leeds by Dr Matthew Davis, Lauren Machon, Prof. Kerrie Unsworth and Dr Mark Robinson, with support from Olivia Solomon, Vedran Lesic and Adriana Atkinson.

The Leeds University Research Team would like to thank the participating schools, and the individuals, whose contributions made the research possible.

2. Aims

The project was commissioned to evaluate the effectiveness of British Gas technology and engagement programmes within schools, to learn lessons and to make recommendations for future initiatives, which would help reduce the amount of energy (gas and electricity), used within schools and at home.

3. Methodology

The research created a set of nine case study schools based upon different types of energy saving initiatives. There were six schools that had participated in British Gas technology and engagement programmes and three schools which had not.

The schools represented a range of primary (key stage 2) and secondary (key stage 3) educational institutions and were drawn from across the UK to ensure a geographically representative a sample as possible.

A total of 19 focus groups were conducted which involved the participation of 130 children. Researchers also conducted 22 interviews with adults, nine of which were the parents of participating children and 13 were school staff members.

4. Results

4.1 Focus Groups

During the focus groups the children identified a number of environmental and energy saving topics without prompt. These topics falls into four overarching themes:

- 1) **Eco behaviours** (i.e. behaviours and actions such as saving water and recycling, turning off lights and other electricals, walking to school, etc.)
- 2) **Eco technologies** (i.e. knowledge of technologies that conserve and save energy, such as electric cars and eco-modes on computers)
- 3) **Energy issues** (i.e. knowledge of energy issues, such as types of renewable energy sources and fossil fuels)
- 4) **Threats to the environment** (i.e. knowledge of energy impacts, such as pollution, global warming, destruction of habitats and loss of wildlife, etc.)

Children in schools that had participated in environmental engagement programmes, such as competitions, lessons and schools trips were able to identify a greater number of topics and issues across all four themes. This engagement was not limited to British Gas engagement programmes e.g., some schools gave examples of working with other organisations and charities.

The pupils within schools that had not participated in engagement programmes displayed a much narrower knowledge base, which tended to focus on the behavioural aspects of saving energy, such as turning off lights and taps when not in use. These behaviours were reportedly learnt from their parents and families at home. Interestingly, those pupils whose school had only participated in British Gas solar panel installation programme, showed the same narrower knowledge base; indicating that the installation of energy saving technologies within a school environment did little on its own to educate or engage pupils.

Many children reported that they learnt about energy saving and the environment at both school and home. At school this learning most commonly came from lessons, art projects, participation in external competitions, homework and after school eco-clubs. At home children reported that TV programmes such as the news and documentaries were responsible for prompting discussions with parents. Whilst many children felt able to enact pro-environmental behaviour at school and at home the activities were sometimes different. For example, at home the children felt more able to turn things off; however, at school they were able to do other activities such as litter picking and energy monitoring.

The focus groups also revealed an age related trend. Younger children (key stage 2) tended to focus on issues within their immediate environment such as litter, transport and altruistic behaviours e.g. not harming animals. Whereas older children (key stage 3) were able to demonstrate a much more global awareness of energy impacts, such as global warming and habitat destruction in the rainforest and arctic regions. However, there was one example of a group of key stage 2 children demonstrating a very sophisticated understanding of the energy industry and fossil fuels solely due to participation in an engagement programme.

The pupils in the focus groups were asked to come up with suggestions for helping them be more engaged in learning about the environment, these ideas included:

- School trips to see how things are made and done
- Adverts, posters and timetables reminding everyone to switch off
- Recycling or energy saving games and competitions
- Competitions to win trips
- More monitors to find out how much electricity we are using
- More lessons on the environment
- A big switch off e.g., turn off lights for one hour a day, no computers
- Inventions and demonstrations e.g., robots, pedal powered lights
- Walk to school initiatives
- Projects using recycled materials
- Educational puppet show
- Visits and talks from people who work in energy

4.2 Interviews

A large part of the analysis focused on understanding the factors that make schools more or less successful at saving energy. A summary of those factors, based in the interviews is now given.

Enablers to saving energy in schools

- More successful case study schools had a dedicated energy or sustainability champion (staff particularly motivated and/or knowledgeable about energy saving) they played an integral role at linking schools with initiatives and schemes, often undertaking this work in their own time. These staff were motivated by their personal values and the high moral value they placed on being responsible citizens.
- The most successful case study schools identified the expertise and knowledge of their champions, placing them in non-teaching roles, or roles which allowed time away from the classroom in which to promote and pursue energy saving and pro-environmental behaviour within the school.
- A key technical enabler was the ability to access and monitor the schools energy usage in real-time. Some of the more successful case study schools used building management systems or software that generated detailed feedback and allowed the school to analyse their energy use over time – this data was even incorporated into teaching activities and lessons.
- The most successful case studies not only had the technical ability to monitor the schools energy use, but a clearly defined responsibility to monitor energy use within a job role.
- Part of the success of influencing energy saving behaviour within school was giving regular and meaningful feedback to staff and students, such as relating energy savings to monetary values or resource; something that champions did on a regular basis.

Barriers to saving energy in schools

- The less successful case study schools had a limited ability to monitor the schools energy usage. Data was pooled manually from billing, which was time consuming and lacked the feedback necessary to help the school identify areas for improved energy savings.
- Although many case study schools reported having new energy saving technologies, their design and installation were not always optimised. For example, automatic light sensors being placed in areas of low activity so lights regularly turned off. This led to sensors being switched off and lights being left on which wasted electricity.
- Some schools were older buildings which meant features such as single glazed windows, high ceilings and a lack of insulation, all of which caused difficulties in reducing the schools energy consumption due to heat loss.

- As we know from the data, energy educational activities can facilitate and support behavioural change in children. Teachers reported that a major influence on their ability to engage in energy education activities was time. Teachers generally reported high workloads, which meant limited time to proactively seek out possible opportunities for educational activities. They were also time-pressured within their planning schedule to ensure the teaching all of curriculum based work.

4. Conclusions

The research set out to evaluate the effectiveness of British Gas technology and engagement programmes, to learn lessons and to make recommendations for future British Gas initiatives, which would help reduce the amount of energy (gas and electricity), used within schools and at home. These results have now been fed back to British Gas and the findings will be used to help shape the design of their future educational initiatives.

As well as the specific application to British Gas, there is a number of research findings relevant to all schools, which could help schools reduce their energy consumption and raise levels of engagement. A summary of these key learning points based upon the evidence for each stakeholder group is provided below:

4.1 Pupils

- 1) Recognise that you have the power to help change adults' behaviour – adults notice when children spot them acting unsustainably, respond to prompts and reminders.
- 2) Take your learning home – help parents and family understand their smart meters, energy usage, how to save energy and why it's important.
- 3) Get involved and play an active part in helping schools cut their energy use – take part in eco clubs, carry out audits to help spot where energy is being wasted or where it has been saved, keep an eye out for competitions and encourage your school to take-part.
- 4) Small changes can make a difference – take action on things that you have control over (more opportunities at home than school).
- 5) You are creative and young people often provide a fresh set of eyes on problems – get thinking and offer solutions to the problems you see (some good examples from the competitions you have entered).

4.2 School Management

- 1) School mission statements and leadership help communicate the importance of environmental issues to school staff and pupils.
- 2) Successes need to be communicated regularly and expressed in a meaningful way – e.g., don't dwell on kWh saved, talk about what the savings

have been used for (e.g., new video camera, books) or teaching roles that have been protected.

- 3) Recognise the contribution that Energy Champions and volunteers can make – but require time and support to achieve potential.
- 4) Provide staff with the tools to assess energy usage and patterns (e.g., appropriate building management systems), these can be used to identify energy wastage and to support teaching activities and lessons.
- 5) Investment in efficient building technologies and accompanying engagement activities can save schools on their electricity costs (statistical analysis of the energy consumption of schools involved in the British Gas programmes demonstrate significant savings are possible when technology and engagement activities are combined, vs. in isolation).

4.3 Teachers and Energy Champions

- 1) Ensure that technology installations are optimised for the school – e.g., automatic light sensors placed in high traffic areas, thermostats accessible for building managers.
- 2) Share skills and knowledge with other staff – build resilience and ensure that hard gained expertise is not lost.
- 3) Create links and lobby for time to address sustainability – e.g., be creative in linking sustainability to other areas of the curriculum and make relevant for colleagues' teaching, lobby school management for timetable buy-out (i.e., time investment offset by energy savings).
- 4) Harness the power of pupils – empower and skill the children to drive behaviour change, e.g., conduct energy audits, remind teachers to switch off, encourage teachers to commit to energy pledges, identify waste and suggest solutions.
- 5) Capitalise on their expertise in engaging children in learning and share successful strategies with colleagues – e.g., interactive apps and games, videos, competitions, hands-on activities and experiential learning, lesson plans and online resources that they have found and approved.
- 6) Recognise the role that teachers and champions play in creating norms and influencing school culture – e.g., role modelling behaviours, encouraging and praising pupils, sharing feedback on gains, weaving environmental examples into the broader curriculum.

4.4 Parents

- 1) Get involved and offer your skills and knowledge to the school – parents may have technical and practical expertise that could help the school to make the right investments or cut their energy use.
- 2) Keep an eye out: alert the school to competitions, schemes and grants, e.g., Makeovers, support for trips, educational campaigns.

- 3) Empower children to take control – teach them how to switch things off and explain why they have been asked to do this, encourage and support them when they show an interest in environmental issues or clubs.
- 4) Recognise your influence as a role model – children take their cues and learn from adults.
- 5) Make the most of smart meters – use them to learn how your family uses energy and set fun challenges to cut your use.

It is hoped that this report provides your school with practical and useful learning from the research project. If you should have any questions and comments, or require clarifications please contact the *project lead, Dr Matthew Davis: email: M.Davis@Leeds.ac.uk or telephone: +44 113 343 683*

We would like to take this opportunity to once again thank you for your schools valuable contribution.

SOCIO-TECHNICAL CENTRE

PUTTING PEOPLE AT THE HEART OF DESIGN



Contact us

If you are interested in joining the Socio-Technical Centre network, hearing more about our research, or if you want help with something in your own organisation, then please get in touch.

Visit www.sociotechnicalcentre.org
or contact stc@lubs.leeds.ac.uk