**How Do Limbo Dancing, Landlords and Students’ Energy Habits Link to EfSD? A Student Green Fund Case Study.**

Peng Li BSc (Hons) MA, Katy Boom BSc (Hons) MBA, Paul Davis

Worcester Students’ Union, Sustainability Department, Worcester Business School

University of Worcester, Henwick Grove, WR2 6AJ

Email: p.li@worc.ac.uk; k.boom@worc.ac.uk ; p.davis@worc.ac.uk

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**Abstract**

University students who live in privately rented houses account for nearly 42% of the student population in the UK, the majority live in relatively old housing stock which is energy inefficient requiring infrastructure improvements to make them more thermally efficient. The student landlord market is a stand-alone sector with some specific challenges including the high turnover of tenants and issues around who pays the fuel bill. This project described and critiqued in this paper is focused on a set of guiding interventions designed to help undergraduate students to save energy at home by changing their behaviour, alongside encouraging property owners to make infrastructure improvements. This paper presents a case study on University of Worcester Students’ Union’s (WSU) behaviour change project funded through the Higher Education Funding Council for England (HEFCE)’s Student Green Fund (SGF). It aims to develop a cost effective model to assist university students to learn and develop energy saving behaviours. Competition on a bespoke student facing software platform, regular incentives and easy to understand reports are part of a multidimensional approach to this intended behaviour change. The overall goal of the programme design is to identify best or most effective practice and develop opportunities to engage with wider employability and academic skills in a number of disciplines. This project runs for two years from October 2013 in Worcester, UK with Birmingham Guild of Students a partner in year two to test the potential for replication of the same model elsewhere.

**Introduction**

This paper discusses the policy instruments and intentions of the Energize Worcester (EW) project. EW is currently using numerous different methods to engage with students studying at, and living in shared houses in Worcester, UK. The project aims to encourage and educate those student tenants to learn and adopt appropriate energy strategies and habits, *and evaluate the cost effectiveness of different methods of interventions*. The project commenced in October 2013. Therefore, the evaluation will be based on the learning and experiences of the first five months. It is tentative and designed to feed forward in a formative learning manner to guide future actions. It begins with an account of the general context of fuel usage and dwelling choice among students in the UK, and more specifically, in Worcester. This overview provides a rationale for intervening and there follows a brief outline of the development of local policy in this field. That development contained a pleasing element of surprise, the significance of which propelled the design of the intervention under scrutiny here. The terms, underlying logic and purposes of that intervention are then set out.

 Beginning, then, with broader context: in the UK, there are approximately 2.5 million students in university in any given academic year. Over 42% live in privately rented accommodation, and indeed the majority live in shared houses classified as Houses of Multiple Occupation (HMO) (Goodman and Drayson, 2014). The quality of that housing provision is an issue. The UK has the oldest housing stock in Europe. According to the English Housing Survey 2012-13, nearly 86% of all English dwellings were built before 1991. Older dwellings often consume substantially higher energy to warm them adequately, compared with more energy efficient new built dwellings. The average Standard Assessment Procedure (SAP) score, a housing stock energy efficiency standard using index numbers, for all UK dwellings was 59 in 2012, where the average SAP score for dwellings built before 1991 is 40.2 (BRE, 2005a, 2005b; Palmer and Cooper, 2013). In addition, the ownership structure of the UK housing stock may present a further issue. Private rental accounts for 18% of English tenure types, but nearly 80% of people in full-time education are private renters. Overall, almost 68% of the entire 16-24 age group are also private renters. A DCLG (2014) report shows the private rented sector has significantly lower energy efficiency measures compared with other sectors on a number of indicators (see Table1).

**Table 1 Percentage of Energy Efficiency Measures by Tenure Types in England**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Energy Efficiency Measures  | Owner occupied dwellings | Privately rented dwellings | Social rented dwellings | National Average |
| Central Heating | 94% | **81%** | 93% | 91% |
| Cavity wall insulation | 43% | **23%** | 49% | 40% |
| 200mm or more loft insulation | 38% | **20%** | 34% | 34% |
| Double glaze window | 78% | **74%** | 88% | 79% |

*Source: English Housing Survey Headline Report 2013-13, DCLG 2014*

 In the UK, domestic energy consumption accounts for almost 30% of total energy usage. The poor housing stock and increasingly frequent severe weather conditions are likely to increase household energy demand. The Department of Energy and Climate Change (DECC) suggests this is likely to drive more households into fuel poverty (DECC, 2014). Reflecting this, the Office for National Statistics finds that the average household energy bill virtually doubled in real terms from 2002 to 2013, despite average energy consumption reducing by nearly 17% over the same period (DECC, 2013a).

 In general, trends in energy use impact on many aspects of daily life and the statistics indicate that students may endure both relative and multiple deprivations. Students often suffer significantly from fuel debt. This may be explained by two further factors, namely a lack of life experience, and a poor understanding of energy distribution and usage (Bouzarovski et al, 2012; DeWater et al, 2007). In addition, Bouzarovski et al (2012) suggest that a significant number of university students do not fully understand their rights in relation to their tenancy and property quality, not to mention energy efficiency. A recent survey conducted by the National Union of Students (NUS) has shown 61% of respondents experience damp in rented houses, 52% think their homes are uncomfortably cold, and a further 48% believe their home is poorly insulated and draughty. However, over 76% of respondents deal with their increasing energy bills by limiting their heating, 66% claim to wear extra layers in order to deal with the cold at home and 40% spend time in public facilities, such as libraries, to avoid home heating (Goodman and Drayson, 2014).

 The indicative evidence of students' generally poor understanding of energy and its effective use suggests a need for learning intervention. Educating students with knowledge about energy efficiency does more than just reduce their environmental impacts in the short term and their expenditure on fuel. The knowledge and skills potentially empowers them to opt for a more sustainable way of living. Given the size of the student population and their importance as future citizens, these choices could potentially influence the future of energy demand across society as a whole (Grønhøj and Thøgersen, 2011).

**Project Background**

In recognition of the national evidence on the incidence of fuel poverty among the UK HE student population, local policy makers in Worcester have been pursuing measures designed to improve the lot of students in this important regard. The University of Worcester (UoW) has around 10,000 students and over 30% of Worcester students live in privately rented HMOs. As with most student housing stocks Worcester’s private rented HMOs are often less energy efficient old houses.

 In spring 2013, the DECC invited local authorities to bid for funding to instigate the Green Deal (DECC 2010, 2012a), an energy efficiency financial package to support domestic housing stock energy upgrades. In Worcestershire, the DECC’s funding supported Worcester Energy Pioneers (WEP), a project in which Worcestershire County Council, Worcester City Council and UoW worked together using trained students as energy assessors to survey HMOs in Worcester. Its instrumental goal was to derive enhanced information on aspects of the rented housing stock in the city. The WEP project also indicated, though, that those students who participated in the project tended to develop a stronger sense of energy efficiency, and they were more likely to adopt or even advocate for domestic energy efficiency in the future. These were largely unintended longer-term WEP impacts that prompted the development of more general behavioural modification initiatives, directly stimulating the development of Energize Worcester.

 In the UK, university students are generally aware of sustainability issues and want them to be reflected in their institutions, their study and their overall experiences. A series of surveys funded by the Higher Education Academy (HEA), and carried out by the NUS found that 85% of first year students think their university should actively promote Sustainable Development (SD), and around 60% of students wish to learn more about it (Drayson et al, 2013).

 Among policy bodies, and in recognition of these student attitudes, HEFCE want to support capacity building to develop skills and show through practical steps how SD challenges can be met. HEFCE in their SD in HE public consultation document noted ‘*With 17,000 universities in the world, higher education is a global enterprise operating collaboratively through the exchange of ideas, students and staff. These connections and the positions of universities in societies mean that higher education has the potential to drive global change*” (2013, p, 7). With this in mind, HEFCE has provided £5 million to support the NUS’s Student Green Fund (SGF), translating into 25 student-led sustainability projects (HEFCE, 2013). EW is one of the projects. It takes the opportunity presented by SGF to support students living in privately rented houses to learn and adopt appropriate energy habits.

**Project Aims**

 EW's publicly broadcast and explicit goal is to work with students in privately rented houses to save quantifiable amounts of energy and money. In pursuing that stated aim, though, an emergent goal (Mintzberg, 1978; Mintzberg et al, 1998) was to create a network of skilled students with enhanced employment opportunities, pro-environmental behaviours and energy-saving habits that are likely to endure and whose impact would spread to their friends and family in the future. For the majority of students, this is the first time they will have experienced independent living – a significant lifestyle change, during which they are forming habits likely to stay with them beyond the moment of change itself. If they develop effective energy habits during university life, they are likely to keep those pro-SD habits throughout their lifetime. Behavioural theory provides one explanation of this. The habit discontinuity hypothesis (Verplanken and Wood, 2006) suggests individuals are more likely to adopt new habits if they are going through a lifestyle change.

 The context in which behavioural modification takes place is also significant, though. The WEP project had indicated that students’ energy behaviours in privately rented HMOs are often influenced by their tenancy occupancy agreement. In so-called bill-inclusive HMOs, student tenants often feel indifferent to wasting energy in order to 'get their money’s worth'. In contrast, in bill-exclusive HMOs, student tenants are often reluctant to switch on their heating in order to minimise their energy expenditure, despite condensation and mould (Goodman and Drayson, 2014).

 Such reflections contribute to the forming of relevant goals and a programme theory, in formal evaluative terms (Sidani and Sechrest, 1999). The EW project has four key objectives:

1. Import knowledge and skills into the student's problem domain to help develop appropriate energy habits
2. Save energy and carbon in student housing use
3. Provide extra-curricular and curricula opportunities to UoW students thereby building their employability skills for the future
4. Develop strong community partnerships working closely with local authorities, community energy transition groups and landlords in order to engage energy infrastructure improvements to student properties

 These objectives align reasonably well against the broad evidence base and implementation theories outlined above - but the fit is not exact.

**Project Action Plans**

One noted problem with many conventional results line readings of how value is produced by public policies is their assumption of a straight-line relationship between what is done by policy-makers and what happens to the evaluation in consequence (Runhaar et al, 2006). There is good reason to believe, though, that a linear aetiology is not wholly appropriate in the present case.

 Darby (2010), for example, identifies four types of feedback system based intervention theories were identified as effective to encourage domestic energy efficient habits, namely:

1. Sociological theory. Improve feedback to consumers to make it more visible, encourage users to feel they are in control of their own domestic energy consumption.
2. Economic theory. Encourage appropriate energy habits with incentives, treat energy as a commodity, and offer consumers financial incentives for their commitment.
3. Psychological theory. Psychological stimulus to consumers are likely to improve their understanding of energy, and in turn adjust their behaviour
4. Educational theory. Provide learning opportunities to help consumers develop effective energy use skills are also likely to encourage behaviour change.

 Darby (2010) conducted her work on behalf of the Office for Gas and Electricity Markets (Ofgem) Energy Demand Research Project to study and examine the effectiveness of interventions. Adopting a similar approach, the EW project has developed a tailored action plan for the students as follows:

1. A bespoke online application that provides accurate feedback to participants’ on their energy consumption over time.
2. Use the existing online application developed during WEP to support retrospective physical energy efficiency measures in HMOs.
3. Recruit and train students as accredited professional Energy Advocate (EA) to support student tenants with energy advice and provide bespoke property in use energy reports.
4. Recruit and train students as energy assessors to deliver property energy surveys in identified student HMOs.
5. Offer financial incentives to encourage participation and commitment.
6. Engage with students from different academic disciplines, to encourage a sociologically wide range of students to participate in EW.
7. Enhanced use of digital and multimedia communications. Designated website and social media platforms have been created as a primary contact point for student support and instant engagement.
8. Liaise with one of the ‘Big Six’ energy companies to supply dual fuel smart meters, to be installed in selected houses as part of the real time in-home display strategy.
9. Work with the National Landlords Association to raise EW awareness among the landlord community. This will also involve exploring financing options to help landlords with potential energy upgrades, permitting more energy efficient homes for students.
10. Agree with a partner (the Birmingham Guild of Students) to replicate the programme logic in Birmingham in the second year of its operation to further test the project model. It is also intended to re-run the same project in Worcester for a second year.

 At the end of the currently envisaged planning horizon of EW, the different methods will be critically evaluated to accelerate (potentially transferable) learning and establish the most cost effective model. This is with a view to creating a ‘product’ for NUS to market to universities, colleges and student unions nationwide.

**Project Progress**

This paper is an initial review of the first 5 months of a two-year project.

The Energize online app has been successfully developed and is available for student users to register and input their energy meter readings. The app serves two main functions: firstly to provide students with a better understanding of the houses they live in by showing property profile data; secondly, to inform students of their energy consumption over time.

 The app provides instant graphics to inform students of their energy performance (energy consumption in the month against a national average). If students input more information on the type and construction of the property, they will also be given more accurate energy performance feedback against similar types of property in the UK (see figure 1). This feedback system can help students to visually track their energy consumption over time (see figure 2). As Benders et al (2005) pointed out, feedback systems, especially software, need to be personalised in order to increase the level of commitment from participants.

*Figure 1, example of the energy meter dashboard for student users*



*Figure 2: Example of Monthly Energy Consumption Calculation*

 There were two reasons for recruiting and training students to function as accredited professional EAs: to enhance their future personal employability, and to use peer-based networks to ease access to the student community. This choice reflects Darby's (2010) insight, that providing learning opportunities helps consumers develop effective energy use skills that are likely to encourage behaviour change. Reliance on peers reflected previous WEP learning indicating that students often preferred to receive help from their peers. Student EAs' main duties are to raise awareness of EW and support students in their homes with energy advice. Therefore, the EAs help students both on- and off-campus; some students will receive house visits and bespoke 'home energy in use' reports.

 The EAs have undergone energy awareness training and are invited to develop a strong sense of ownership of the project, plus a willingness to use their new skills and knowledge to help peers. It is anticipated they will also develop a more appropriate lifestyle of their own. Given their centrality, the impact on the EAs and their influence on peers will be closely monitored.

 EW has been designed to integrate into the curriculum wherever possible, working closely with students from different academic backgrounds. It offers opportunities to engage with students who are possibly less likely to associate with energy projects. This is exemplified by working with creative arts students to develop a creative campaign for the project. In a ‘live’ brief scenario, art students were given just 24 hours to research and develop a creative marketing campaign. The winning concept campaign and slogan “How Low Can You Go”, uses limbo dancing as a symbol for energy/carbon reduction. The orange and black colour theme represents both contemporary trends and warmth. The concept was tested through focus groups and used as EW’s communication strategy for engagement and raising awareness.

 In terms of Darby's (2010) Economic theory, EW provided incentives, monogramed pencils, rulers, chocolates, and T-shirts as ‘ice-breakers’ to encourage students to register and commit to the project.

**Results**

A variety of performance indicators (PIs) have been generated to describe aspects to EW. These have not yet been systematically mapped against the project's knowledge, condition, values, attitudes, skills or behavioural (KSAB) assumptions (Alden, 2006). The project results for the first 5 months are described through these provisional PIs below.

**Table 2 Measured Performance to Date**

|  |  |  |
| --- | --- | --- |
| **Key project parameters** | **Year 1 Target**  | **Result to date** |
| No. of students trained as EAs | 5 | 5 |
| No. of households supported by EAs | 50 | 48 |
| No. of households participating in the project  | 150 | 48 |
| No. of students living in participating households (ave 4.5/property) | 675 | 216 |
| Unique page views on the website | 60,000 | 3,500 |
| Social media followers | 1,000 | 200 |

Through a promotional stall, a total of 71 students registered, with 48 property addresses recorded. An email was sent through Mailchimp, an advanced mailing system enabling the tracking of recipients’ email reactions. Those responses are listed in Table 2.

**Table 3 Recipients’ Attitudes Analyses**

(N=71)

|  |  |  |
| --- | --- | --- |
|  | **EW email response rate** | **Industry Average** |
| No. of recipients opened the email  | 19.6% | 16.2% |
| No. of recipients clicked the web link on the email | 2.2% | 1.9% |

Further engagement was elicited via a targeted email to around 3000 students identified as living off-campus and eligible to access EW services. This used WSU’s email system with a message promoting incentives. It did not secure further student registration.

 Economic incentives sought to encourage students to input their meter readings and included food vouchers and cash prizes. However, results to date show that this is proving to be a particularly difficult venture. From the 71 registered students, only 9 have spontaneously entered meter readings, 3 of which are EAs. These results are disappointing and the barriers to inputting readings are being investigated further.

**Project Reflection**

The EAs have found their training to be highly positive. They have effected significant improvements in their personal understanding of domestic energy matters. These students have changed their energy habits at home, and have become more confident in talking about domestic energy issues. One EA, who had never previously lived in privately rented accommodation, had very little understanding about energy. When he started searching for a shared house with friends, he was determined to find a home that was easy and cheap to heat:

*“After learning about energy efficiency, I am determined to find an energy efficient house for next year, and I know that is my right.”*

 *--First year EA*

 EAs will be monitored to assess whether their experience and knowledge has influenced friends' tenure choices. The EAs’ peer influence might also impact on the final evaluation of the cost effectiveness of the models, as the training for the accredited energy awareness certificate is relatively expensive.

 In their on-campus peer discussions, EAs reported the majority of students expressed concern with energy bills and agreed with the project aims. However, many remained reluctant to participate. Motivating students to engage with energy conservation projects remains a challenge. Focus group discussions were held in early-2014 to explore reasons for this reluctance. Findings include:

* Energy issues are not a priority. Students are less likely to commit to something if it does not have an immediate impact on their lives.
* Low brand recognition. EW is new, students perceived it as an independent organisation not associated with the more trusted and recognisable WSU and UoW brands and did not recognise it.
* Complexity in software use. Some students found the software somewhat more complex than expected. If they found the registration or data input process difficult, they were more likely to give up as a result.
* Low energy literacy rate. Lacking in energy knowledge makes it very hard for students to fully understand energy and this produces a perceived loss of control over home energy.
* Email fatigue. Students receive innumerable emails from UoW, WSU and affiliated clubs and societies, including EW. If they are deemed irrelevant, they are ignored.

 How might this situation of expressed concern but inattentive behaviours be explained? The selection bias theory (Clayton and Myers, 2009; Frederick et al, 2002), suggests that, if the affect (energy cost reduction) is not going to happen immediately, the threat (high bills) is likely to be discounted. Thus, many students will prioritise course work over housing conditions. Faced with multiple daily demands and with only finite ability to foreground issues, students appear to be displaying a degree of mindlessness (Seiling and Hinrichs, 2005) on this issue of energy use.

 Using incentives to keep an issue in the foreground appears of only limited utility. Bell et al (2013) suggested that financial incentives can only encourage simple commitments. The EW results to date mirror these findings. Drawn to the project by merchandising and allied 'goodie bag' incentives, 71 students initially registered, but these did not translate subsequently into students inputting meter data. It is too early in the evaluation to determine this with certainty, as other technical factors may also contribute: the website user interface may be unsuited for students, for example. Further monitoring is therefore being undertaken.

**Interim Conclusions**

At the time of writing, the project was only 5 months into its two-year lifespan and these are preliminary findings. Some things are becoming clear, though. First among these is the fact that EW has yet failed to reach and change the behaviours of target students on the scale hoped. Students face a knowledge gap in fully understanding domestic energy use and the importance of energy efficiency. Energy literacy could then have a stronger impact on energy habits when citizens feel in control of domestic energy matters (DeWater et al, 2007; Allcott and Mullainathan, 2010). Effecting this cognitive enlightenment is, preliminary EW findings suggest, not proving easy, in the midst of great competition for students’ attention. The initial strategy was to deploy personalised messages containing energy information to spark initial interest and then build up to deeper engagement (wherein behavioural change might be effected). Comprehension then precedes behavioural change, but many students may exit before that point is reached. This reflects the fact that EW has finite foregrounding power and that it works in a context of constrained student memory and finite issues management capability (Behr and Iyengar, 1985; Thøgersen, 2006). Students can be expected to juggle only so much.

 The motives of those who have been affected by EW to date are clearly heterogeneous. The EAs are likely to possess pro-social inclinations and their actions need to be understood and evaluated as such (Thøgerson, 2011). National survey data suggest that many of their UoW student peers may share their attitudes, but they do not share EAs' knowledge or behaviours. The recruited EAs have demonstrated greater personal understanding of domestic energy matters. This means greater caution in their energy usage, more confidence in engaging with peers on energy related issues and willingness to use their knowledge to make an impact. This greater readiness and capacity has, though, been expensively attained. The effectiveness of the cascade-training model (situating EAs at its conversational heart) is not yet known, but will be closely monitored.

 There are as yet unrealised options for reinforcing EW's underlying logic. This includes the installation of smart meters in selected households. As Darby (2008; 2010) found, in-home display systems present a more dynamic and visual account of energy performance, potentially encouraging more rational usage. Community engagement actions are also in their infancy and may yield partnerships with the local authority, local energy groups and landlords in order to investigate Darby's Social feedback mechanisms. Finally, and deepening EW's behaviourist design, a tighter bundling of its portfolio of initiatives might be used to overcome the thresholds of student attention that may be blocking the project from making further progress (Neuner, 2000). Even where EW surmounts these barriers, further behavioural surprises may await. It is plausible to argue, for instance, that students that do learn better energy husbandry approaches may also de-learn those approaches in unexpected ways. Others may feel guilt at violating early promises of participation and deploy complex guilt offsetting behaviours (Steenhaut and Van Kenhove, 2006). All represent valid behavioural responses to EW and should be captured in its evaluation.

 These various potential changes are significant. They do not nullify the programme goals or objectives set out earlier, but they significantly adapt them. The ability of EW to enact such change lies in the fact that the project governors have the power largely to set their own goals, within broad parameters and for finite period of time. EW is therefore a teleonomy (de Laguna, 1962) that is willing and able to mould its own emergent strategies. Not only that, but the range of its governing stakeholders is clearly changing over time. Latterly and through new connections, unexpected further opportunities and experiences have been uncovered that is likely to prove relevant to its future development. In short, the governance structure for EW is shifting to reflect emergent organising (Christensen, 2004). Finally, the evidence base that was reviewed above is largely derived from national sources or from research done for other purposes, In other words, EW may be characterised as a non-evidence-based programme. These three factors taken together strongly suggest a specific approach to the evaluation of this initiative. Following Shen et al (2008), EW may be understood through the Fidelity - Adaptation problematic, where a lack of precise and tailored foreknowledge precludes the design of a tightly structured, goals-oriented intervention (see also, Berman, 1978). Only an approximate program logic can be adduced for the initiative, its iterative and groping nature is not a policy design failure, and nor is the low take-up to date an implementation failure. The evaluative task is to assess the interaction between the EW initiative itself and its governing stakeholders, where the latter's values and beliefs form an equal part of the evaluative design.

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**Biographical Note**

Peng Li is the project leader of Energize Worcester. He is an Associate member of Institute of Environmental Sciences; he has an MA in Sustainable Development Advocacy, a postgraduate degree with strong professional skills development across a whole range of sustainability aspects. Peng is particularly interested in advocating for sustainability, energy conservation and behaviour change. Working with students in a Students’ Union, Peng has experience in sustainability related student engagement in Higher Education.

 Katy Boom is Director of Environmental Sustainability at the University of Worcester. She has led the development of wide ranges of sustainability initiatives focusing on the campus, working in the community and embedding sustainability in the curriculum. The University consistently tops the nationally recognised University 'Green League' table and became the first English University to be awarded platinum EcoCampus status. Overseeing the development of students as partners on major sustainability change programmes and building sustainability skills with students and student volunteers Katy’s work has won a number of national awards.

 Paul Davis is senior lecturer in the Worcester Business School. His research interests include evaluation frameworks and their broad relation to theories of worth. He has published on realist evaluation methods and undertaken numerous commissioned evaluation exercises in local government and for private corporate clients. He is currently investigating the use of deontological systems to shape the conduct of university business schools.