



Article

The Engagement of Students in Higher Education Institutions with the Concepts of Sustainability: A Case Study of the University of Northampton, in England

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Abstract: Across higher education institutions there has, for some time, been a growing move towards incorporation of the concepts of sustainability into the policies and practices of the organisations. Using the University of Northampton, in the United Kingdom as a case study, this project aimed to understand the efficacy of student engagement with a sustainability project called Planet Too. The study employed a range of methods including waste and energy audits, as well as questionnaire surveys both with students and landlords to examine their environmental attitudes, beliefs, and practices. The project was able to lead to increased awareness and engagement with the concepts of sustainability amongst the students. Recycling, though it was not one of the initiatives focused upon, was a key practice mentioned by both students and landlords. The engagement of the landlords was focused primarily on conservation of energy and water. However, conservation practices generally remained static, with limited significant or long-term changes in environmental practices. The key implications of the findings are discussed and recommendations suggested.

Keywords: sustainability; higher education institution; environmental management; recycling; sustainable waste management

1. Introduction

An increasingly consumption-based society is negatively impacting upon the environment, health, and the economies of countries, leading to concerns over resource (in)security and calls for paradigm shifts away from linear consumption and production, to more circular practices [1–3]. Given their role in shaping future generations, Higher Education Institutions (HEIs) play a vital role in facilitating improved environmental practices [4,5]. As such, since the 1990s, HEIs have developed and implemented a range of environmental initiatives in order to embed the concepts of sustainability into their practices, as well as to shape future generations [6–9].

There are a number of policy drivers and programmes in place to facilitate the embedding of the concepts of sustainability into the policies and teaching and learning activities of HEIs, including: (1) the signing of the Talloires Declaration in 1990 by various vice chancellors, rectors, and presidents, which focused on “inequitable and unsustainable production and consumption” [10]; (2) the UN Decade of Education for Sustainable Development (ESD) (2005–2014) [11], and the subsequent 2014 UNESCO World Conference on ESD, in Aichi-Nagoya, Japan, which launched the Global Action

Programme (GAP) on ESD [12]; (3) the Tbilisi Declaration, 1977 and the Halifax Declaration, 1991 [13]; and (4) the increasing global need for skills development in the area of sustainability [14]. For example, the UN [Decade of Education for Sustainable Development \(DESD\)](#) aimed to emphasise the crucial role education plays in achieving the sustainable development goals. In addition, globally, there has been strong political commitment for the integration of education for sustainable development (ESD) at all educational levels [15].

Given the focus on integrating the importance of HEIs, an understanding of how best to facilitate greater engagement of HE students with the concepts of sustainability is therefore crucial. This manuscript provides an evaluation of a three-year project called Planet Too (P2) led by the University of Northampton' (UoN) Students' Union (SU), and funded by the National Union of Students' (NUS) and the Higher Education Funding Council for England (HEFCE). Using a number of different initiatives, the project aimed to encourage uptake of more sustainable practices amongst the students.

2. Student Engagement with the Concepts of Sustainability

As a means of encouraging student engagement, HEIs first started to introduce environmental issues into their processes around the 1960s in the USA [7]. During the intervening decades, the focus for these efforts has shifted from the promotion of professionals in the 1960s and 70s, to waste management and energy efficiency in the 1980s, and later, global environmental issues [16]. The incorporation of the concepts of sustainable development into the processes of HEIs was viewed as a means of preparing future leaders, decision-makers, and entrepreneurs for a more sustainable world of work [5,17]. In addition to the environmental benefits, there has also been a realisation that institutions can accrue enhanced reputational and financial rewards (e.g., being seen as a 'green' campus or receiving funding for meeting environmental compliance targets).

Initiatives to engage students have tended to be focused either on incorporating the concepts into the institution's general activities [18], or teaching and learning [19,20]. For example, sustainability education has tended to incorporate activities such as campus greening initiatives, field visits, environmental courses, and workshops [5]. However, the effective implementation of these initiatives faces a number of challenges and requires the input of a range of stakeholders (e.g., students, academics, managers, and support staff), if they are to be successful [5]. Indeed, strategic leadership has been shown to be important for success [21,22]. In [5], it is suggested that HEIs should develop formal and extra-curricular activities, while policy makers should provide guidance to HEIs on how best to incorporate sustainability concepts. Reference [10] argues that if societies are to become more sustainability orientated, HEIs' leaders, faculty, and students need to work more closely together. Various writers (e.g., [21,23]), note that there was a need for more student engagement. However, while there have been studies focusing on staff (e.g., [24,25]) and student learning (e.g., [26,27]), there has been limited research into the psycho-sociological constructs surrounding student engagement.

Motivation and education have been shown to be important [28]. However, others argue that in order to be successful, environmental initiatives (e.g., energy conservation), within HEIs should go beyond simply focusing on knowledge and awareness, to move towards triggering cognitive constructs, including: habitual behaviours/routines [29,30], values [31,32], and attitudes [16,33,34]. In addition, the contextual environment within which staff and students operate also has to facilitate a change to the new habitual behaviours, and away from existing practices [35–37]. This might be achieved either by changing the contextual/situational factors and the degree of sacrifice required [9,38–42] (e.g., access to recycling facilities), or by providing the staff and students with the ability to change their intentions and plan their intention-based (volition) behaviours accordingly (e.g., the influence of family, friends, neighbours, and education) [31,43–46]. Similarly, [47] argues the need for multi-faceted, systematic approach. Students are more likely to undertake "light green" actions that involve "minor" lifestyle changes (e.g., recycling, saving energy and water, using public transportation and buying organic, fair trade and healthy products), as compared to more major practices (e.g., eating less meat or paying more for renewable energy) [34,48]. Support from the faculty, administration, and facility management staff is crucial to the success of programmes [49].

In the UK, despite there being a number of initiatives to improve student engagement (e.g., EcoCampus, which is a national Environmental Management System (EMS) and award scheme for HEIs, that allows them to be recognised for addressing key issues of environmental sustainability, including carbon reduction), engagement is generally low. For example, [50] reported that:

- Some 8.2% of students do not recycle
- Approximately 50% were of the view that they were doing as much as they could to recycle, however, the others required support, particularly those living on halls of residence on campus. Indeed, those living on campus were less likely to recycle if it required additional effort, compared to those living in private rented accommodation
- Students living off campus were less likely to be aware of campus recycling systems
- Environmental benefits are key motivators for recycling
- Recycling behaviour whilst at university is consistent with practices during the holidays

Thus, there is a need to better understand not only how best to facilitate greater student engagement with sustainability practices across the HEI sector in the UK, ~~but also how best to facilitate engagement with sustainability practices off-campus.~~

3. Materials and Methods

The study sought to employ a variation of the mixed method ecological social marketing model [51,52], which builds on the community-based social marketing/behaviour change approach of practitioners (e.g., [53,54]). The model in [51] draws on an ecological model of behaviour change, embracing various layers—e.g., individual, interpersonal, and community (in the case of this study, landlords renting private accommodation to students). An ecological approach treats behavioural systems as complex ecologies with multiple influences working in competing directions to influence behaviour.

Specifically, the study sought to examine the effectiveness of the P2 project, as evidenced by the sustainability practices of students living both on campus as well as off, and the key influencing factors that impacted on these practices. The research was undertaken in two main phases, a baseline study to gather information on existing environmental attitudes, beliefs, and practices, and a follow-up survey to understand the impact of selected initiatives from the P2 project. As noted in the introduction, the project employed a number of initiatives to facilitate more sustainable practices whilst the students were on and off campus. These initiatives included: (1) use of Changemaker champions; (2) Student Switch Off, and; (3) a Green House awards scheme. Changemaker champions were volunteer students who worked with the Students' Union to facilitate greater engagement amongst the wider student population with the principles of sustainability. Student Switch Off is an international scheme run in the UK by the NUS, designed to encourage students to become more energy efficient in their accommodation [55]. The Green House Awards scheme involved provision of incentives to the students in private accommodation to encourage them to practice more sustainable behaviours (e.g., recycling or conservation of energy). To evaluate the Green House Awards scheme, the student accommodation was inspected by two members of the P2 project team, based on set criteria (e.g., the presence of double glazing on the windows, wall and loft insulation, as well as engagement with recycling and conservation of electricity by the students). If the houses were deemed to have met the criteria, they were awarded Green House status. The interventions were undertaken from November 2013 to April 2015. An energy audit was also employed to evaluate actual behaviours. As a means of contextualising the practices of the students, the study also sought to understand the influence of a key stakeholder within the lives of students who lived off campus, landlords.

3.1. Student Surveys

A base line questionnaire survey was undertaken in October/November 2013. The survey involved 577 students, chosen at random, on both of the main UoN campuses. In November 2014, a follow-up survey was conducted, with 311 students, again chosen at random. Both surveys were

conducted face-to-face, with participants completing and returning the questionnaires immediately to the researcher. Questions included: what pro-environmental activities do you take part in whilst you are living in your term-time accommodation? Which activities consume the highest electricity usage? Can you list two sustainability initiatives employed on campus by the University of Northampton? What would encourage you to engage in a sustainability initiative? What are your views on the environmental sustainability initiatives at the University of Northampton?

Student engagement with the initiatives was assessed by determining the number of participants (e.g., at road shows and in student accommodation), and those undertaking training. This engagement was determined over the two years of the P2 project (November 2013–October 2015).

3.2. Energy Consumption Audits

The Student Switch off campaign took place during February and March 2014. Some 52 houses took part, with 27 being visited to evaluate their energy usage. Eleven houses acted as a control group. In addition, some 38 properties were recruited to supply meter readings. In order to calculate the average energy consumed, the number of occupants was determined by multiplying the number of bedrooms per property. The overall consumption for the property (based on the meter readings), was then divided by the number of occupants, and then by the number of days between readings.

3.3. Surveying Landlords

During November and December 2013, a questionnaire was developed to understand the types of sustainability measures employed by landlords. The questionnaires were distributed by email, via both the lead for a grouping of approximately 200 private landlords, and a Northampton Borough Council (NBC) list of landlords, via the (private) accommodation office at UoN. These emails were followed up a week later with telephone calls, in order to maximise the number of questionnaires completed. Approximately 60 calls were made. In total, 29 questionnaires were completed and used in the study, giving a response rate of 14.5%. The aim of the surveys was to gauge the attitudes and beliefs of the landlords towards the concepts of sustainability, as well as to examine what approaches were being employed to facilitate the students engaging with the concepts whilst living in the house. Questions included: what sustainability measures do you utilise within your property? Is your property accredited? Are utility bills included within the rent students pay?

4. Results

4.1. Student Surveys

4.1.1. Socio-Demographic Characteristics

Table 1 shows that the participants were primarily female, in the age range of 16–25 years and living in private accommodation. They were mainly studying courses in education (40 students: 6.9%), management (39 students: 6.7%), and business studies (37 students: 6.4%).

Table 1. Socio-demographic characteristics of the respondents for the base line survey.

Factor	Sub Factor	Frequency	Percentage
Gender	Male	223	38.6
	Female	348	60.3
Age range (years)	16–25	486	84.2
	26–35	52	9
	36–45	17	3
	46–55	9	1.5
	>56	1	0.17
Accommodation	Halls	125	21.6
	Private accommodation	446	77.3

As listed in Table 2, there was good student engagement with the interventions. For example, a total of over 1600 students signed up as Changemaker volunteers, participated in the Green House awards, or received a loan or grant. This total represents nearly 12% of the total student population. Some 141 were trained in the concepts of sustainability and 14 as Changemaker auditors. Over the two years, 131 properties participated in the Student Switch Off scheme.

Table 2. Student engagement with the Planet Too (P2) project.

Factor	Frequency
Students actively engaged with P2 initiatives	1630
Student led sustainability enterprises	3
Properties accredited during the Green House awards scheme	47
Student volunteers recruited and trained	141
Properties recruited for Student Switch Off+	131 over two years
Changemaker auditors trained	13

4.1.2. Attitudes and Beliefs about Sustainability

Most respondents were of the view that any conservation of resources would be more likely to benefit the UoN (59.5%), as opposed to benefitting them personally (42.2%). Some 59% stated that they conserved resources because it was good for the environment. While 29.5% noted that they would require an incentive to be more sustainable. There was a difference between male and female students ($\chi^2 = 2158.29, 16$), however, the rationale for this difference is not clear and would require further study. The course being studied did not have any significant impact upon the views about conservation or practices of the students.

Figure 1 illustrates that most were of the belief that the main factors impacting on their electricity usage were everyday activities and doing their studies.

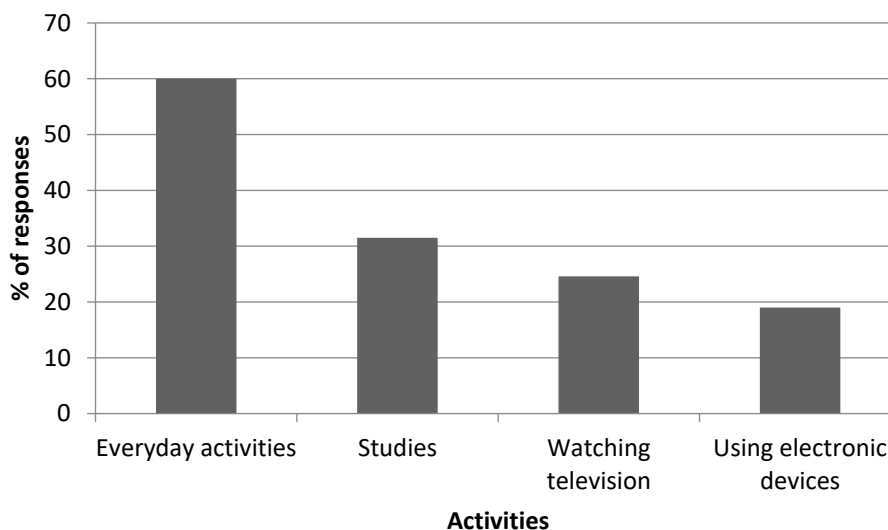


Figure 1. Key reasons for electricity usage during term-time accommodation.

4.1.3. Awareness of Sustainability Initiatives

Figure 2 highlights that in the baseline survey, when students were asked to list two environmental sustainability initiatives on campus, around 29% were able to do so. However, by the follow-up survey this figure had risen to 41.4%.

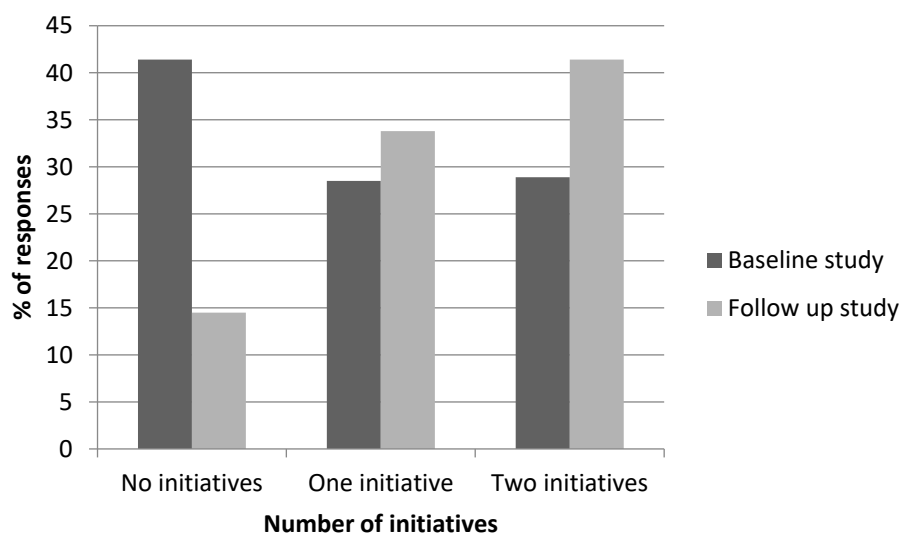


Figure 2. The number of environmental sustainability initiatives students were able to list, before and after the interventions.

Table 3 shows that the main environmental sustainability initiatives identified were recycling, the Student Switch Off scheme and the use of sensors for lighting. Interestingly, water conservation and the sale of fair trade products were only mentioned by two students and one student, respectively.

Table 3. Environmental sustainability activities at UoN as reported by the respondents.

Factor	Baseline Survey		Follow-up Survey	
	Frequency	Percentage	Frequency	Percentage
Recycling	251	43.5	232	65
Student Switch Off+	67	11.6	18	5
Sensors for lighting	41	7	19	5.3
Electronic submission of assignments/limitation of printing	22	3.8	3	0.8
The University's buses	16	2.7	7	1.9
Planet Too	15	2.6	10	2.8
Limiting parking on campus/encouraging car sharing	14	2.4	-	-
Recycling of food waste	8	1.4	1	0.3
Use of eco-friendly vehicles	3	0.5	-	-
Use of solar panels	2	0.35	10	2.8
Use of water saving devices	2	0.35	1	0.3
Sale of fair trade products	1	0.17	1	0.3
A UoN bicycle scheme	-	-	82	23
Allotments on campus	-	-	5	1.4
Energy saving bulbs	-	-	8	2.2

In the baseline survey, some 61% of the respondents were of the view that environmental sustainability initiatives at UoN were either very good or good. However, in the follow-up survey, this fell to 55.2%, with around 28% being unsure. When asked about how sustainability could be improved, students made mention of more recycling (e.g., for glass and food), generally, as well as in halls. Other options included increased water conservation, use of light emitting diode (LED) lighting and light sensors, insulation (e.g., use of double glazing for windows and doors), and solar panels.

The main sustainability actions students engaged in while they were at home were recycling and walking (Table 4).

Table 4. Key environmental sustainability practices of students outside of term time during the baseline and follow-up.

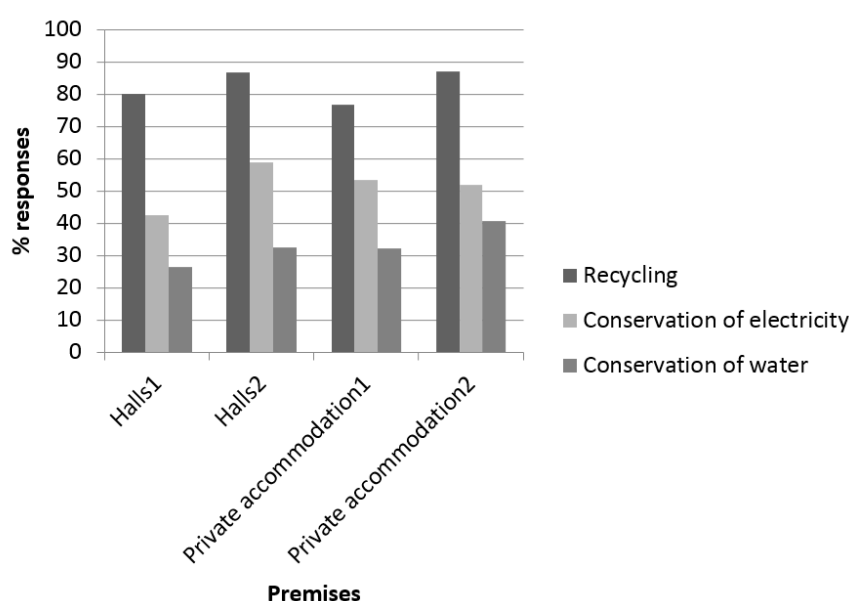
Factor	Baseline Survey		Follow-up Survey	
	Frequency	Percentage	Frequency	Percentage
Recycling	438	76	285	79.8
Walking/cycling	300	52	149	41.7
Conserving electricity	285	49.4	163	45.7
Conserving water	163	28.2	118	33.1

As listed in Table 5, the activities during their time at university were similar, with recycling and conservation of electricity being key practices. Indeed, there was a very strong link between what they did at home and in their term-time accommodation. For example, those who recycled at home were likely to do so while at university ($\chi^2 = 2334.4, 20$), and this was also the case for conservation of electricity ($\chi^2 = 1593.55, 9$) and water ($\chi^2 = 16,665.6, 9$), respectively. Another important point to note from Table 5 is that reported environmental sustainability practices remained relatively constant during the two surveys.

Table 5. Key environmental sustainability actions of students during term time, during the baseline and follow-up.

Factor	Baseline Survey		Follow-up Survey	
	Frequency	Percentage	Frequency	Percentage
Recycling	442	76.6	269	75.4
Conserving electricity	292	50.6	175	49
Walking/cycling	280	48.5	149	41.7
Conserving water	177	30.6	110	30.8

If these factors are broken down on the basis of living on halls or private accommodation, there was around a 16% increase in electricity conservation on halls, but with a slight dip in private accommodation (Figure 3). It is important to note though that there was no statistically significant variation between students living in halls and those in private accommodation.

**Figure 3.** Comparison of environmental sustainability practices while living in halls and private accommodation, for the baseline (1) and follow-up surveys (2).

4.2. Energy Consumption in Private Accommodation

Figure 4 shows that the smaller the property, the higher the average energy used per occupant.

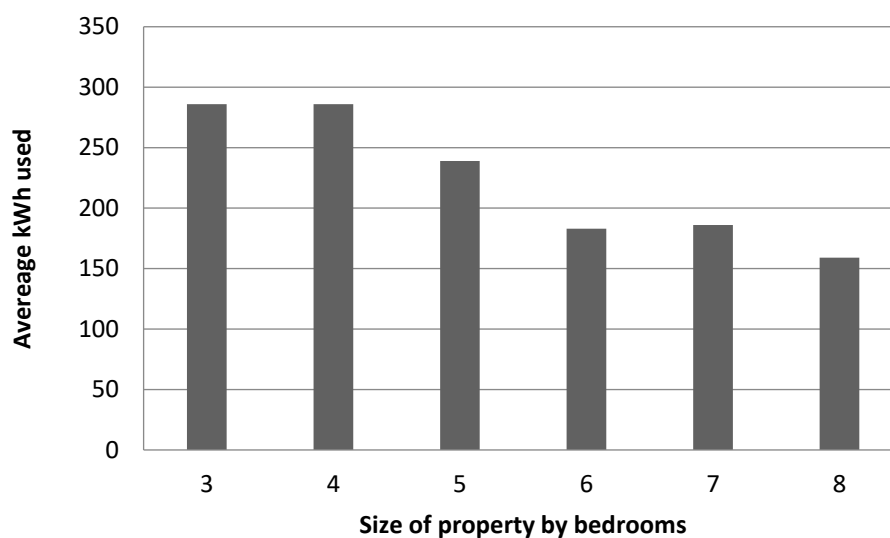


Figure 4. Average kWh per occupant versus the number of bedrooms in the property.

4.3. Landlords' Engagement with Sustainability

At the time of the study, the majority of the private student housing stock was over 50 years old and primarily employed a terrace design (i.e., the houses were in a row and joined on either side to a neighbour). Helping the environment and the potential for saving money were amongst the key drivers for a more sustainable approach by landlords. Levels of engagement with sustainability support agencies (e.g., the Carbon Trust), were generally 'low', with only around 33% of landlords engaging. Around 32% of the houses did not have environmental accreditation. Electric meters, thermostat controls and loft insulation were the three main energy conservation measures employed. Recycling was the most mentioned sustainable waste management activity. All properties had electric meters and around 72% had water meters. Most students (47%) paid their rent and bills separately, while 31% of the properties were all inclusive (i.e., bills were included in the rent).

5. Discussion

5.1. Students' Engagement with the Concepts of Sustainability

Student engagement with the sustainability 'interventions' of the P2 project was generally good, with nearly 12% of the overall student population participating. Similarly to previous studies, generally, students reported strong positive views on sustainability, with most of the opinion that it was good for the environment [53]. Interesting, however, most were also of the view that any benefits would accrue primarily to the University. This view may perhaps indicate why nearly a third of the respondents stated that they would require some form of incentive in order to be more sustainable in their resource consumption.

Views on the environmental sustainability initiatives at UoN fell slightly in the follow-up survey, even though it was still over 50%. While there were a number of suggestions for how sustainability could be improved on campus, many of these strategies were actually already being undertaken by the University. This suggests that there is a need for greater promotion of the range of environmental sustainability activities (apart from recycling), that the University employed.

The recycling message amongst the students was strong, both at UoN and at home, indicating a spill over of behaviours between settings [33,47–50]. Indeed, levels of awareness of recycling were

high from the outset of P2 and throughout. It is something that was also mentioned quite often by the landlords. However, recycling was not one of the P2 interventions. In addition, the overall raising of awareness, however, should perhaps be tempered with the fact that recycling was at the start and throughout, by far the most recognisable environmental practice in the minds of the students. Thus, it is quite likely that this high mention of recycling had very little if anything at all to do with the P2 project. In all likelihood, it may have simply been because recycling bins were visually prominent on campus, but could also be due to a general social awareness of recycling. Similarity in practices during term time and whilst not at university are similar to previous studies [56].

Awareness of environmental initiatives on campus did rise between the baseline and the follow-up surveys (Figure 2 and Table 3). This is evidenced for example, by the high levels of knowledge about the bikes in the follow-up questionnaire survey (Table 5), as well as an improvement in the ability to name at least one environmental sustainability initiative (Figure 2). However, awareness did not appear to necessarily translate into sustainability behaviours, which is ultimately what is required to provide a legacy of sustainable practices. Indeed, despite the rise in electricity conservation on halls, overall reported environmental conservation practices were relatively constant (Tables 4 and 5). In addition, while awareness did increase and there was engagement, particularly through the Student Switch Off, maintaining this momentum throughout the project proved challenging. This lack of translation of high awareness into actual behaviour is similar to the assertions of previous writers (e.g., [29–32]). It confirms that whilst awareness and knowledge are important and there is a complex interrelation between various influencing factors [57], there is a need to go beyond these constructs if new attitudes, values, and habits are to be created. In this context, the continued involvement and support of key internal stakeholders (e.g., senior managers across the University), would also be crucial to facilitating the sustainability of the concepts from the project [52,58].

Thus, despite the improvements, there are still opportunities to go further. For example, there are significant areas for improvement in getting the students to conserve resources, especially for electricity and water consumption. Opportunities also exist for them to become more engaged with the wider sustainability initiatives that are already in place at the University.

5.2. Landlords' Engagement

The involvement of landlords with P2 from the outset worked well and was very beneficial. It enabled access to private accommodation, as well as feedback to be had from landlords. This link therefore made the project's processes and outcomes much richer, for example, with respect to the development of the criteria for the Green House awards. There were some landlords who were engaged with the concepts of sustainability, encouraging recycling and the use of insulation, thermostat controls, as well as electricity and water meters. Of these, nearly half had a separate billing system for utilities that meant that students were aware of and could manage their electricity and water consumption. However, generally, the engagement of the landlords with the concepts of sustainability was low, as evidenced by the response rate to the survey and through informal discussions with both students and landlords. This limitation amongst landlords generally therefore had the knock-on effect of not facilitating changes to students' intention-based (volition) behaviours [29,43,45].

The low level of accreditation may simply have been due to the fact that at the time of the study, the accreditation schemes for student houses by the Northampton Borough Council (NBC) was being overhauled and, therefore, landlords were being redirected to the East Midlands Landlords Accreditation Scheme (EMLAS) and Decent and Safe Housing (DASH) for accreditation. Moreover, the accreditation was no longer specific to student property, as had been the case under NBC's existing Northampton Student Accreditation Scheme (NSAS).

5.3. Overarching Issues and Recommendations

While there were positives from the project, there were too many interventions. The number of interventions spread the resources (e.g., Changemaker volunteers) too thinly and made it difficult to

make more than superficial impressions on the values, attitudes, and habits of students. The link between the various interventions was maybe not always as clearly outlined as it should have been. It would perhaps have been better to focus on a select number of strongly linked and focused interventions/issues. ~~In addition, the complexity of the wording of schemes made it difficult to communicate the information to students.~~ These challenges would therefore have had an impact on changing the habits of the students, as the steps taken during the implementation phase of interventions play a crucial role in their success [37,41,459]. Managing so many initiatives made effective implementation of the overall P2 project difficult.

There needed to be more focus on embedding sustainability initiatives and practices. For example, the fact that most of the environmental initiatives suggested were already being employed by the University indicates that there is a need for greater promotion of the range of environmental sustainability activities that UoN employs. However, given the short-term nature of the project and the transient nature of students, this will always be a challenge.

Even though recycling and electricity conservation were regularly mentioned, most students were of the view that any savings in resources would be more of benefit to the University than to themselves. These issues might be linked to wider shifts towards individual consumerism and the commercialisation of students with rise in tuition fees. Nevertheless, there should be a focus on emphasising the personal benefits in order to encourage greater student engagement.

Finally, there needed to be stronger incentives put in place to recruit and maintain the engagement levels of Changemakers. Those that did become Changemakers evidently found it beneficially in improving their skills and competencies, as evidenced by this improvement being the key benefits realised. Thus, the incentives could potentially be linked to enhancement of skills and competencies. In addition, while they were provided with some training in sustainability issues, they perhaps could have also benefitted from some training in engaging with students.

6. Conclusions

The embedding of the concepts of sustainability within the policies and practices of HEIs is an increasingly important issue, and within recent decades has gained significant momentum globally. Within this shift, the engagement of all stakeholders, including students, plays a key role. The findings from this project suggest that sustainability initiatives can work and can facilitate engagement of students and other stakeholders such as landlords. However, it also suggests that crucially, the necessary framework must be in place to facilitate changes in environmental values, attitudes, and habits, in order for there to be meaningful and long-term behaviour change. To be successful, initiatives should be simple, sell the benefits to the individual and actively involve all key stakeholders, particularly senior managers at the HEI and others such as landlords and councils (to map to environmental practices whilst at home, outside of term time).

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