

STUDENT'S WILLINGNESS TO CHANGE A PATHWAY TO CARBON NEUTRALITY

ABSTRACT

To lower human-induced carbon dioxide emissions in the atmosphere, the world must aim toward a carbon-neutral future to successfully combat climate change. The research aimed to investigate students' willingness to change their attitude as a pathway to achieving carbon neutrality. An online survey was created using the JISC tool to examine students at the University of Salford's desire to change their behaviour to meet a carbon neutrality objective. Overall, 122 responses were received from the respondents and a non-parametric statistical approach was used to analyse the data. The Spearman's rho correlation coefficient of respondent's familiarity level with climate change and their willingness to change was found to be moderate negative and statistically significant at 0.001 level. Out of 122 respondents who completed the study survey, 30 (24.6%) of them said that they first learned about climate change in school, Internet and television sources came second on sources utilised for information. In addition, 93 (76.2%) of the respondents were ready to give up certain individual benefits to reduce CO₂ emissions. Carbon neutrality seems like an ambitious goal for policymakers to attain; though people are willing to alter their lifestyles to reduce CO₂ emissions in the areas of energy consumption, food waste, and transportation. However, they are not willing to go beyond if doing so will cost them more; people need to be made more aware of the issue and adopt a pattern to reduce wasteful lifestyles to reduce carbon footprint, and it will require true political and widespread social commitment.

Keywords: Carbon Neutrality, pathways, lifestyles, Salford

1. INTRODUCTION

The continued existence of life on earth is at risk due to global warming, which is brought on by the excessive emission of greenhouse gases, caused by human activities (Kilkiş et al., 2020). It has not only threatened life, but also threatens the availability of natural resources, energy, food accessibility, and other areas of the environment, which poses a serious risk to human well-being (Kushawaha et al., 2021). The objective of addressing significant concerns with the current economic improvement model that would create a low-carbon and ecologically friendly environment has caused the interest of the global population to focus more on climate change in recent decades (Li et al., 2020).

In order to achieve a low-carbon environment, humans' day-to-day lifestyle must target a carbon neutrality future, by reducing carbon dioxide (CO₂) emissions in the atmosphere caused by anthropogenic activities, like using fossil fuels for power generation, transportation, heating, and food handling. Carbon neutrality which can also be referred to as Net-zero carbon dioxide (CO₂) emissions, is the balance of CO₂ inputs into the atmosphere with the CO₂ removal from the atmosphere, to prevent CO₂ from increasing in the environment, which results in global warming (Wu et al., 2022).

According to Smith et al. (2018) in their research, if greenhouse gas (GHG) emissions continue to increase at the rate they currently are rising, or even faster, the temperature will rise by 1.5 degrees Celsius or more, it will cause climatic extremes to occur more frequently and more intensely, and this will result in greater hazards in the future. The most vulnerable systems are those that affect the environment and food production. Coastal flooding, the decline of marine life, and a decrease in seasonal rainfall are just a few of the negative repercussions that will harm the globe (Intergovernmental Panel on Climate Change, 2018).

In many nations, which includes the UK, China, New Zealand, Sweden, and France, net-zero objectives of the Paris Agreement have been made public. However, it is still up for debate in other developing and underdeveloped nations; although, many countries throughout the world are starting to accept the adverse effects and risks of GHG emissions on the environment (Huang & Zhai, 2021).

Climate change and global warming are the two ecological and environmental problems that humanity now faces. Unless nations across the world take appropriate measures, laws, and other efforts, the

diminishing natural environment will continue to harm the next generation (Li et al. 2021). As a result of the ongoing use of fossil fuels, global carbon dioxide emissions reached 34.81 billion metric tonnes in 2020 (International Energy Agency, 2021), making a significant contribution to global warming. Even though the ultimate goal is for all countries to be carbon neutral for the continued existence of life in the environment, different individuals, communities, towns, and organisations have various ideas for reducing emissions.

Among 198 nations of the world, only three countries Bhutan, Suriname, and Panama representing almost 4.5% have achieved carbon neutrality objectives (Laurie, 2021), 10.6% have acknowledged and perhaps even determined to achieve carbon neutrality targets, 8.6% have enshrined it in law to achieving carbon neutrality objectives, 29.3% have developed appropriate strategies to achieve carbon neutrality targets, and the remaining 47% are still debating appropriate policies to achieve carbon neutrality goals (Chen et al., 2022).

Rapid urbanisation is nearly the current occurrences in nations of the world in the 21st century, and this has led to an international urban problem in light of the climate emergency and energy crisis that is ravaging the world. Urban migration increased dramatically in the 20th century, and today there is global urbanisation at one end and growing CO₂ emissions at another end (Liang & Yang, 2019). According to the United Nations, cities are where the battle for a society that is carbon neutral will either be won or lost; this is because as of 2017, 54% of the world's population lived in cities, which was also where about 70% of the world's energy was used and approximately 75% of greenhouse gas emissions connected to energy were released into the atmosphere (University of Reading, 2021).

Although achieving the Paris Agreement's climate change mitigation objectives depend on each individual's carbon footprint actions that will be taken (United Nations Framework Convention on Climate Change, 2015), this is because the UNFCCC acknowledges individual efforts and provides a list of actions that people may take to reduce GHG emissions (Reichl, et al., 2020). However, there are many options available to citizens, such as purchasing environmentally friendly goods, reduction of food waste, and making energy-saving choices, lifestyle changes have not yet been fully used as a major pathway to meet CO₂ neutrality objectives (Dubois et al., 2019).

The necessity for at least some public awareness of the origins and effects of carbon emissions, as well as the capacity and desire for individuals to cut emissions, is highlighted by policy approaches that rely on individuals' voluntary carbon reduction. However, the contextual implications of carbon and energy in daily living and decision-making, have not been given much attention in order to achieve a worldwide carbon-neutral environment for everybody (Whitmarsh et al., 2011). This research was conducted to bridge the knowledge gap by investigating the University of Salford students' willingness to change, as a pathway to achieving the climatic set targets of the United Kingdom to reach a net-zero future.

1.1 Research Objectives

The research aim was to investigate students' willingness to change their attitude to achieve a net zero environment and the objectives of the research are to:

1. Examine if there is a relationship between what students studied in school and their knowledge of climate change.
2. Critically determine the main sources of information for students on the topic of climate change.
3. Evaluate student's willingness to change their behaviour to contribute to carbon emission reduction.
4. Determine if there is a relationship between students' knowledge of climate change and their willingness to change their attitude to achieve carbon neutrality.
5. Estimate students' acceptability of climatic policy to achieve carbon neutrality.

2. RESEARCH METHODOLOGY

2.1 Study Area

Salford is located in the Northwest of England and is one of the cities in Greater Manchester, within the boundary of Salford are Bolton and Wigan at the west, Bury, Rochdale, and Manchester at the East, and Warrington and Trafford in the south (University of Salford. "n.d.")

This study was conducted at the University of Salford because of its diversity of the different populations of students both international and from within Europe. Manchester has one of the largest student populations in Europe, with over 70,000 students choosing to reside there. Salford is known for having a dynamic city centre with a unique European atmosphere, as well as a thriving international lifestyle. (University of Salford Profile and Courses "n.d.").

2.2 Methodology

A quantitative research approach was adopted, to primarily examine students at the University of Salford's desire to alter their behaviour in order to meet a carbon neutrality objective, an online survey was developed using the JISC online survey, which includes closed-ended and open-ended questions. Comparable options were available in the survey, this is because according to Krosnick et al (2002) in their research, found out that people are more likely to acquire an opinion or attitude without this choice, hence they strongly advocate against allowing respondents to choose this "no option". However, Grendall and Davies (2003), recommended that it is important to include a "no view" option, and this is in contradiction with the decision to have all inquiries need a response. Only a balance between the two theories on the survey allowed this strategy to function. Although the survey had more of a closed-ended question to help guide respondents not to form an opinion.

2.3 Sampling Technique

The Probability sampling method was used for this study because it incorporates an aspect of random selection, that ensures that every member of the sampling population is given an equal opportunity to be selected for the study (Berndt, 2020), there were no financial incentives for responding to the survey, with the reality that individuals that took part, did so with their genuine interest in the subject and a more accurate result was obtained from the analysis of the data from the online survey.

2.4 Method of Data Collection

Data from this research were collected using a JISC online survey tool of the University of Salford, a shareable link was created and disseminated through more than five student social media channels, including University of Salford student WhatsApp groups, Facebook groups, LinkedIn, and indirect and direct emails. This was done to keep the survey limited to the student population. The number of students who got the survey link could not be determined since it was shared by other colleagues and students. The funding organisation Tertiary Educational Trust Fund (Tetfund), and Federal Polytechnic Ekowe Bayelsa State is not involved in the collection and analysis of data for this research.

3. RESULT AND DISCUSSIONS

The sample represents 63 (51.63%) Undergraduate and 58 (47.54%) Postgraduate students between the age range of under-eighteen to over fifty. About 53.3% of the survey participants were female; 36.9% were male and about 9.8% prefer not to say. In that group, 28 (23%) were from the business school, 27 (22.1%) were from the school of health and society, 25 (20.5%) were from the school of arts, media, and creative technology, 42 (34.4%) were from the school of science, engineering, and environment see **Table 1**.

Table 1: Demographics of Respondents

	SAMCT N (%)	SHS N (%)	SSEE N (%)	SBS N (%)	Total N (%)
Total	25 (20.5)	27 (22.1)	42 (34.4)	28 (23)	122
Gender					
Male	6 (4.9)	11 (9.0)	20 (16.4)	8 (6.6)	45 (36.9)
Female	19 (15.6)	11 (9.0)	17 (13.9)	18 (14.8)	65 (53.3)
Prefer not to say	0 (0)	5 (4.1)	5 (4.1)	2 (1.6)	12 (9.8)
Age					
Under eighteen	14 (11.5)	8 (6.6)	9 (7.4)	16 (13.0)	47 (38.5)
18 – 24	8 (6.5)	18 (14.8)	20(16.4)	9 (7.4)	55 (45.1)

25 – 34	3 (2.5)	1 (0.8)	11 (9.0)	3 (2.5)	18 (14.8)
35 – 44	0 (0)	0 (0)	2 (1.6)	0 (0)	2 (1.6)
45 – 54	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
55 – above	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
The highest level of Education attained					
Secondary School	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
College	1 (0.8)	0 (0)	0 (0)	0 (0)	1 (0.8)
Undergraduate	18 (14.8)	12 (9.8)	15 (12.3)	18 (14.8)	63 (51.7)
Postgraduate	6 (4.9)	15 (12.3)	27 (22.1)	10 (8.2)	58 (47.5)
Professional Certification	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

***SAMCT**: School of Arts, Media, and Creative Technology; **SHS**: School of Health and Society; **SSEE**: School of Science, Engineering, and Environment; **SBS**: Salford Business School

About the respondent's familiarity level with the issue of climate change, was categorised into four groups; novice which represented 26 (21.3%) of the respondents, apprentice which the majority of the respondents fall under, representing 56 (45.9%) of the total responses, practitioner which is the second largest represented 34 (27.9 %) of the respondents and expert with the smallest population which represented 6 (4.9%) of the respondents (see figure 1). This shows that the majority of the respondents are still at the apprentice stage when it comes to the issues of climate change and emission reduction.

Table 2: Spearman's rho Correlation Matrix

	What School are you at the university?	How familiar are you with the subject of climate change?	Are you willing to sacrifice some individual benefits to reduce carbon emissions?
What School are you at the university?	1.000		
How familiar are you with the subject of climate change?	.003	1.000	
Are you willing to sacrifice some individual benefits to reduce carbon emissions?	.019	-.479**	1.000

** . Correlation is significant at the 0.01 level (2-tailed).

The result of the Spearman's rho correlation coefficient of respondent's familiarity level with climate change and the school the participant is enrolled at the University of Salford showed no correlation i.e., was not significant so the H1 was retained. However, when compared with respondent's willingness to change their lifestyle, it was moderately negatively correlated with their level of familiarity with climate change and statistically significant at both 0.005 and 0.001 levels i.e $r = -0.479$, $p < .001$ therefore, the H2 was rejected (See **Table 2**).

3.1 Respondent's sources of climatic information

Out of 122 respondents that responded to the research survey, 30 (24.6%) which represent the majority of the respondents, picked school as the first place they first came across the word climate change, Internet and Television sources were second in the channels used, which was very close to school channel as the first place respondents got their information on the issue of climate change,

they both represented 27 (22.1%) respondents respectively in the responses gathered, Radio represented 25 (20.5%) of the respondent, followed by friends and relatives 8 (6.6%), environmental protection campaign represented 4 (3.3%) of the respondents and Newspapers was the lowest with just 1 (0.8%) of the respondents. These demonstrations that newspapers are not effective in passing climatic information to people in the study area.

3.2 Respondent's Willingness to Change

Moreso, respondents were asked, if they are concerned about the issue of climate change, 95 (77.9%) of the respondents were concerned, while 27 (22.1%) were not concerned. Furthermore, 93 (76.2%) of the respondents were willing to sacrifice some individual benefits to reduce CO₂ emissions, while 27 (22.1%) of the respondents were not willing to sacrifice individual benefits. This shows that people are highly aware that climate change is a problem to our environment and are willing to make a little adjustment to reduce their CO₂ footprint, Whitmarsh et al. (2011) also confirm the high awareness of people on the issue of climate change.

3.3 Respondent's acceptance of climatic policies

Table 3: Respondent's attitude to climatic mitigation strategies

Statement	SD	D	N	A	SA
People should only use electric vehicles, public hybrid buses, and cycling for their trips within Greater Manchester to better the environment	8	29	46	33	6
Everyone should give up their private non-environmentally friendly automobiles to reduce emissions	17	30	47	26	2
People should start paying for carbon emissions that they generate	17	19	39	43	4
Frequent environmental audits should be carried out in every home	1	3	13	61	44

* **SD:** Strongly Disagree; **D:** Disagree; **N:** Neutral; **A:** Agree; **SA:** Strongly Agree

The majority of the respondents were indifferent in their response, it may be possible that these results (Table 4) are due to the fact that people's acceptances of climate policies have been found to be influenced by a number of social, psychological, and demographic factors (Kitt et al., 2021; Lorenzoni et al., 2007; Whitmarsh et al., 2011). Moreso, the social level to implement some of these CO₂ reduction policies may not be available to individuals who have the willingness to reduce their CO₂ footprint (Lorenzoni et al., 2007).

4. CONCLUSION AND RECOMMENDATION

Achieving carbon neutrality seems an ambitious objective to achieve by policymakers. However, if individual behavioural changes are viewed as a pathway to carbon reduction, it will go a long way toward assisting countries throughout the world in achieving their CO₂ neutrality goals.

According to the study survey, people are prepared to change their lifestyles to minimise CO₂ emissions in the areas of energy use, food management, and transportation. However, they are not willing to go beyond if doing so will increase their costs. Additionally, it was discovered that carbon is not a visible factor in daily decision-making, that misconceptions persist, and that the gap between knowledge and behaviour is consistent with earlier findings on public participation in climate change and carbon reductions.

Even more so, a person's acquaintance with climate change did not necessarily indicate that they would be willing to modify their behaviour to minimise CO₂ emissions. These might indicate that there are certain obstacles that prevent even informed and motivated people from acting as stated in Whitmarsh et al., (2011). When analysing several respondents' water end uses, it shows that the majority are willing to reduce their shower duration for a better environment. Showering typically represents the most indoor demand, accounting for between 30 and 45 percent of all residential consumption (González-Gómez et al., 2022).

The public needs to be made more aware of the issue and adopt a pattern of reduced consumption which requires true political and widespread social commitment. Even at the individual level, a drastic shift in beliefs, behaviour, and institutions is required to successfully combat climate change and meet the UK Government's goal of an 80% reduction in carbon dioxide emissions.

- There should be more investigation on how individuals consider minimising their carbon footprint when making decisions and carrying out daily activities.
- To monitor their progress in lowering their carbon footprint, people should regularly undertake an environmental audit at their homes to evaluate their day-to-day lifestyle.
- Governments must begin implementing the payment of taxes for individual emissions at all levels to meet the specified carbon neutrality goals.
- People should only cook what they can consume and buy what they can use.

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APPENDIX

Project Task Description	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22
Initial Preparation						
Research topic familiarisation						
Gathering of Literatures						
Review of relevant Literatures						
Development of Research Design and Methodology						
Submission of Research Proposal						
Application for Ethical approval						
Development of the Research Survey						
Data collection						
Analysis of data						
Final project preparation and conclusion						
Submission of final Research project						

UNDER PEER REVIEW