

ATTITUDES TOWARDS ENVIRONMENTALLY CONSCIOUS LIFESTYLE AMONG UNIVERSITY STUDENTS IN BUDAPEST - IN LIGHT OF THEIR PURCHASING DECISIONS AND WASTE MANAGEMENT

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Abstract. Environmental awareness is playing an increasingly important role in our purchasing decisions, and a growing number of consumers strive to reduce their environmental footprint – but do they have the necessary information? Our research analysed how much importance students at the Budapest Metropolitan University attach to environmental awareness in their purchasing decisions – for example, do they buy second-hand products, do they bring their own bags when shopping and are they aware of different packaging materials and where to dispose of them? The survey found that, in addition to saving money, environmental awareness also played a role in the respondents' purchases of used electronic devices (such as mobile phones, tablets, laptops, desktop computers or game consoles). By their own admission, a significant part of the students, nearly 88%, usually take their plastic, paper or textile bags with them when shopping so that they can use them to take the purchased items home. The correct disposal of the various types of waste presents a mixed picture: while most respondents would place frequently used packaging materials in the appropriate waste containers, there were also several cases when this provided a challenge for them, which could be caused by a lack of information or by a variety of contradictory information. The research found that students prefer environmental actions requiring less commitment and sacrifice. They are not willing to make significant efforts or sacrifices to achieve environmental goals, even though they have already recognised the importance of environmental protection and are aware of their responsibilities as the future generation.

Keywords: environmental protection, environmentally conscious lifestyle, selective waste collection, waste management.

Introduction

The environmental problems that are increasingly visible in our daily lives are making ordinary people more sensitive to environmental issues. In a Eurobarometer survey conducted in December 2019, 94% of respondents said that protecting the environment was important to them personally, compared to 95% in Hungary. 78% at the EU level and 79% at the Hungarian national level said that environmental issues have a direct impact on their daily life and health. The most important environmental problems were climate change (53%), air pollution (46%) and the increasing amount of waste (46%). In Hungary, the ranking was slightly different: the increasing amount of waste was the most important issue (58%), followed by climate change (51%) and air pollution (45%). The solution was expected more from changes in consumption habits (33%) than changes in production and trade practices (31%). In Hungary, the proportions were 28% and 19% respectively. This recognition has led the majority of consumers to take action for the environment: 66% collect waste separately, 45% avoid single-use plastic products (except plastic bags) and 42% buy local products. In addition to the selective waste collection (53%) and avoiding single-use plastic products (45%), consumers in Hungary have tried to reduce energy consumption (38%) [1].

As the above statistics show, many consumers have already realised that they need to change their own consumption behaviour to protect the environment. The role of the younger generations is particularly important in this area, because – as consumers – they are already using the natural resources that they will be the primary users of as adults. They will also be future company managers, politicians, scientists and, more generally, employees, consumers and role models for the generations that follow. As it is their future that is at stake, they tend to break out of the era of uncertainty and lack of purpose and become active – they are also called the “Greta generation” because of their climate activism [2].

The paper is structured as follows: first, the importance of Generation Z for environmental protection is presented, followed by the identification of the main elements of environmental awareness. Among these, we focus primarily on attitudes towards the environment and formulate our hypotheses based on lessons from previous international and Hungarian research. In the section on research findings, we present the results of our questionnaire survey of students at the Budapest Metropolitan University in spring 2021 and examine the hypotheses we have previously identified. In the conclusions, we try to

make suggestions that could help raise the level of environmental knowledge and attitudes of the next generation of leaders.

What makes Generation Z special in terms of environmental awareness is that it is the first generation born at a time of environmental crises, terrorism, the explosion of technology and wider spread of social media. This generation is referred to in the literature under various names (post-millennials, centennials, Generation Z) and there are also differences in how the generation is age-graded (born after 1995, born after 2001, born between 1995-2010) [3]. Those born in the era are currently in their teens and twenties, and most of them are university students or recent graduates.

Being the first truly global generation, thanks to the broadband internet and social media, they have access to a vast amount of information and are therefore aware of global issues, which has led to their strong sense of social responsibility. As consumers, they expect companies to take care of their environmental impact; offer them green products, and in their own lives they try to adopt green behaviour and pay attention to, for example, selective waste collection [3].

This is why we chose to focus our study on this generation from an environmental perspective. Environmental awareness is a basic prerequisite for sustainable consumption, which consists of the following main elements: “*ecological knowledge, environmental values, environmental attitudes, willingness to act, actual action*” [4].

The environmental value system is mainly influenced by stimuli from members of the immediate environment, which mainly means family, friends, and professors in the case of university students, but the educational system also provides a lot of input [5]. Ecological knowledge is the factual knowledge about the environment that influences an individual’s mindset, values and attitudes, and through this, the willingness to act and the actual action [4]. In terms of its content, ecological knowledge can be divided into three parts: systemic knowledge (why the ozone hole is a problem), action-level knowledge (how our individual actions can reduce the environmental damage we cause) and knowledge of efficiency (the effectiveness of environmental behaviour in protecting the environment) [6]. The last of these is the most challenging, as in this case the consumer needs to be able to recognise, for example, the extent to which different types of packaging materials damage the environment.

Environmental attitudes refer to the individual’s outlook on the environment, which has a significant influence on their environmental behaviour. Positive environmental attitudes mean that individuals recognise the negative environmental impacts of their behaviour, which can motivate them to adopt environmentally conscious behaviour. However, the existence of environmental attitudes alone is not a sufficient condition for this [6]. However, it is worth highlighting that knowledge is part of the component of attitudes [4]. A survey conducted among students in Malaysia found only a weak relationship between students’ knowledge and sustainability practices and between their attitude and sustainability practices. It shows the complexity between students’ knowledge, attitude, and sustainability practices [7]. Another survey from India came to the same conclusion – high level of environmental knowledge and positive environmental attitudes did not lead to high level participation in environmental protection activities [8].

The impact of universities on environmentally conscious purchasing behaviour is questioned in a study by Janmool and Khajohnmanee, who found that while formal education had an impact on indirect environmental behaviour (promoting environmental principles, preferring an environmentally conscious workplace), it did not significantly affect direct environmental behaviour (reuse, recycling, energy conservation). Their survey of university students in Thailand showed that the most common direct environmental behaviour was to turn off lights and air conditioning when not needed. Other popular responses included not using plastic shopping bags, reusing, or recycling plastic packaging and collecting waste separately. However, an interesting finding of the research was that strong positive environmental attitudes are not necessarily associated with environmentally conscious behaviour and that a course on environmental protection taken at university did not contribute significantly to environmentally conscious behaviour [6].

A somewhat opposite finding was made by Schmidt in the USA. In his study, the environmental attitudes and behaviour of the students taking the environmental course reached a higher level than in the case of those who did not take the course. By completing the course, environmental problems became more significant and relevant to the students. The author assumes that the knowledge gained this way

will also be applied in other situations, which will influence their behaviour regarding environmental awareness [9].

According to Ahmad and her co-authors Malaysian students preferred the Internet to find environmental information, but also identified the role of educational institutions and family members as important in providing students with environmental information [7]. Recent research published in 2021 highlights the importance of social networks, alongside the internet, in raising environmental awareness, based on a survey conducted in Slovakia [10].

In a Hungarian study, university students were more likely to be environmentally aware than secondary school students. While 79% of the former group said that they collected waste separately, only 47% of the latter did so. University students (91%) were also more likely to collect hazardous waste separately than high school students (58%). Of course, the results reflect participants' self-reported behaviour, not actual action. Among the factors that inhibit environmentally conscious behaviour, financial reasons (67%) and the lack of conditions for an environmentally friendly lifestyle (64%) dominated among university students, while the latter factor (43%) and the lack of adequate information (39%) were the most prevalent among secondary school students [5]. To further investigate the inhibiting factors, we use Hypothesis 1, by which we examine the motivations for buying used electronics.

The results of a survey conducted in 2015 among students at the Faculty of Economics and Social Sciences of the Budapest University of Technology and Economics showed that respondents considered themselves environmentally aware, but the actions they identified as being taken for environmental reasons are typically activities that are easy to carry out, not requiring a significant commitment and indicate other, even material considerations besides the environment. An example of such an activity is the environmentally friendly way of travelling. In addition, many people chose natural ingredients, collected waste separately or avoided disposable products. Activities that require more effort, such as choosing a more environmentally friendly chemical or considering the environmental reputation of the manufacturer when making purchasing decisions, were not chosen at all by respondents. Financial and convenience reasons were cited as the main barriers to environmental awareness, as well as a lack of opportunities. Lack of knowledge was cited much less often. Students who considered themselves environmentally conscious were typically more willing to pay higher prices for products that were less harmful to the environment [11].

The results of a student survey conducted at the Széchenyi István University, Apáczai Csere János Faculty of Humanities, Education and Social Sciences show that respondents believe that we are currently overusing the Earth's finite resources. It is interesting to note that although students are genuinely concerned about climate change and its consequences, and 88% of them collect waste selectively, far fewer of them focus on waste prevention and recycling, even among those who are particularly concerned about waste [12]. In this context, students' preference was also for environmental activities that do not require significant commitment and sacrifice.

Mónus and co-authors analysed the environmental awareness of students at seventeen universities in Hungary with a questionnaire. The survey, which focused on environmental attitudes and environmentally friendly behaviour, also investigated students' materialistic attitudes, life satisfaction, opinions on the Covid-19 pandemic, and political views. The authors found a correlation between these factors and indicators of environmental awareness. Their findings showed that students gave a higher priority to climate change and environmental and social issues than the general population. Environmentally aware students were less likely to have a materialistic approach, less likely to hold right-wing views and more satisfied with their own lives. Their responses indicated that they believe that diseases, including the coronavirus pandemic, are a consequence of modern lifestyles. At the same time, they felt that the behavioural patterns adopted during the coronavirus epidemic (either by choice or by necessity), could be useful in the fight against climate change. However, they were less confident that these behaviours would become embedded in people's daily lives, even after the epidemic had passed [13].

Based on the previous research, we assume that women are more environmentally conscious and therefore more aware of where to throw away the products – our last hypothesis is related to this. Research by Zelezny and co-authors [14], analysing studies published between 1988 and 1998,

attributed women's more socially and environmentally responsible behaviour to differences in gender socialisation (care about others, taking others' perspectives into account). Their survey of primary and secondary education showed that these differences can be detected even at this age, including concerns in the areas of waste and recycling.

A study of Filipino university students by Medina and Toledo-Bruno found that men had a higher ecological footprint than women. This may be due to men's less sustainable lifestyles and their greater mobility, i.e. they tend to drive more [15]. However, a 2020 study in South Africa found no statistically significant difference between female and male students in terms of environmental concerns, knowledge, attitudes and environmental entrepreneurship [16]. Recent research conducted among students in Slovakia did not find significant differences between male and female students in the level of environmental awareness [10].

Materials and methods

Since a significant part of ecological knowledge is invisible and therefore difficult to measure [4], our research investigated the environmental attitudes of students as consumers using different variables among students at the Budapest Metropolitan University. At the same time, as a distorting effect, we had to consider the manifestation of the expected attitude instead of the real, actual one and the fact that the questionnaire as a research method does not follow the logic of everyday life. In addition, the anonymity of the survey also reduced the sense of responsibility. These factors limit the generalisability of the conclusions drawn from the research.

Between April and July 2021, we conducted primary research among students in Hungary, at the Budapest Metropolitan University. The online questionnaire contained a total of 58 questions, for which a number of hypotheses were identified beforehand. In the context of the present study, the following hypotheses are examined:

1. **Hypothesis 1:** Students have purchased a used electronic device (such as a mobile phone, tablet, laptop, desktop computer or game console), mainly due to lack of money or saving money, rather than environmental concerns.
2. **Hypothesis 2:** Students tend to carry their own plastic bags, paper or textile bags when shopping, as an environmentally conscious lifestyle is very important to them.
3. **Hypothesis 3:** Students are always aware of how and to which waste containers they should dispose of different types of waste such as takeaway drink cups, used tissues and napkins, yoghurt and sour cream cups, styrofoam and cup holders.
4. **Hypothesis 4:** At least half of the respondents are aware that cup lids, takeaway paper cups, paper boxes used as food containers, and yoghurt and sour cream cups should be washed before being thrown away at the appropriate place.
5. **Hypothesis 5:** Among those surveyed, women are more aware of where to throw away the types of waste listed in the survey.

The results of the online questionnaire were analysed using SPSS and Excel. A total of 307 students participated in the survey, with the following gender breakdown of respondents: 61% female, and 39% male. These proportions broadly reflect the gender distribution of the university's student population.

Results and discussion

In this chapter, we will examine the hypotheses presented in the chapter *Materials and methods*, using the results of the primary questionnaire survey.

Our *first hypothesis* considered the motivation to buy second-hand electronic products. Environmental attitudes, including the factors that inhibit environmentally conscious behaviour, were investigated by analysing the purchase of used electronic goods (e.g. mobile phones, tablets, laptops, desktop computers, and game consoles). In a previous study among university and high school students, financial reasons were identified as a primary barrier [5]. However, second-hand products are typically cheaper than new ones (except for special, unique products and rarities), so this can be an ideal area for environmental awareness and can also save money.

Cost savings are the primary motivation for buying second-hand electronics among survey respondents – 134 of them selected this response option. The second most frequent answer is

environmental awareness, chosen by 112 respondents, representing 36.5% of the survey participants, i.e. just over a third. The third most frequent answer focuses on the uniqueness of the products purchased (84 answers). Financial constraints are the fourth most frequent answer, together with the purchase of second-hand products that are no longer available (39-39 answers).

For this question, respondents were given the option to select more than one answer, with 307 respondents selecting a total of 369 options. It can therefore be concluded that there is a clear primary motivation for the research participants to buy second-hand electronic products. While accepting the first hypothesis, it is noteworthy that, by their own admission, more than a third of the respondents had already bought some second-hand electronic goods with a specific environmental motivation.

Our *second hypothesis* investigated the extent to which the surveyed students pay attention to environmental awareness during the purchasing process. Our question asked whether they take their own plastic bags, paper or textile bags with them when they go shopping, specifically with environmental considerations in mind. This is an interesting question because, apart from packaging materials for fruits, vegetables and bakery products, shops charge for bags and sacks. So, if you do not prepare in advance and do not bring your own bags, you will have to pay more at the checkout.

In response to this question, 269 respondents gave a valid answer, 236 of whom said that they carry their own bags specifically for environmental reasons – this is 88% of the respondents. A secondary motivation was cost saving, with 81 respondents not wanting to pay for bags sold in shops for money. As a result of the Covid pandemic, hygiene is also highlighted; this factor was mentioned by 28 respondents who are reluctant to choose bags that could have been touched by someone else. A factor that is not insignificant, but less important according to the responses, is that the shop sometimes runs out of bags and if the consumer does not take their own, they will not be able to pack the items during and after the purchase. Only 3 respondents chose this option. This question also had more than one response option, with a total of 348 options chosen by the 269 respondents, giving an average of 1.3 responses per respondent.

Based on the results, we accept our second hypothesis, which was that, by their own admission, survey respondents usually carry their own bags or plastic bags when shopping.

Our third and fourth hypotheses focused on the proper management of different types of waste. For the *third hypothesis*, we investigated the students' awareness of how and in which waste containers to dispose of different types of waste. We asked about the treatment of cups and lids used for takeaway drinks, yoghurt cups and their foil, paper boxes for food delivery, used napkins, used tissues and styrofoam as waste. The detailed results are shown in Table 1, sorted in descending order of correct treatment.

The data show that the highest proportion of survey respondents (71%) admitted that they were aware of the correct handling of cup lids, i.e. that they knew to dispose of them with the plastic. The majority of respondents also knew that paper food boxes (60%) and paper takeaway cups (51%) should either be disposed of with paper waste or disposed of in the waste yard. Slightly fewer respondents indicated that both used tissues (48%) and used paper napkins (45%) should be included in mixed waste, as they are no longer recyclable due to contamination.

Styrofoam is a relatively rare type of waste and is not encountered very often by students, so this question had the highest percentage of unsure (19%) responses. A similar percentage (19.5%) knew the correct answer, i.e. that it should be deposited in the waste yard and should not be placed in the container for the separate collection of plastics. The same percentage of survey respondents knew that yoghurt or sour cream cups should be placed in mixed waste. Although made of plastic, the multiple types of plastic in the cup material mean that it is typically not recyclable, and greasy contamination on the inside can be a problem. Yoghurt foil was the type of waste that was most often mishandled by survey respondents, with only 0.3% of respondents knowing that this packaging material should be disposed of in a waste yard.

In conclusion, we can state that the students who filled in the questionnaire found it more challenging than expected to correctly dispose of the different types of waste. Recognising the type of material and determining the level of contamination can also be a problem. Unfortunately, many manufacturers fail to put any information on the packaging of their products about recycling options, so

consumers are often left with the dilemma of which bin would be the best place to put the packaging material they are holding. The results only partially confirm our third hypothesis on this topic, which must therefore be rejected.

Table 1

Appropriate placement of different packaging materials

Packaging material	Appropriate placement	Correct treatment (%)	Incorrect treatment (%)	Does not know
Cup lid	plastic waste	71.0%	24.1%	4.9%
Paper box suitable for carrying food	waste paper/waste yard	59.9%	37.1%	3.0%
Paper cup for takeaway	waste paper/waste yard	61.2%	32.6%	6.2%
Used paper handkerchief	mixed waste	47.6%	50.2%	2.3%
Used paper napkin	mixed waste	45.0%	52.8%	2.3%
Styrofoam	waste yard	19.5%	61.9%	18.6%
Yoghurt/sour cream cup	mixed waste	19.5%	77.9%	2.6%
Yoghurt foil	waste yard	0.3%	92.5%	7.2%

Source: own table based on primary research

The *fourth hypothesis* focused on the proportion of different packaging materials that respondents wash before throwing away. Yoghurt and sour cream containers are the most washed by respondents (49%) by their own admission – probably because this habit has become quite common over the past decades. Moreover, these products are typically consumed in their homes or other confined spaces (workplace, university) where they usually can rinse the plastic cup before placing it in the waste bin.

This is followed in frequency by the washing of takeaway cups (35.5%) and paper food containers (34.5%). It is likely that the difference in these packaging materials compared to plastic cups is not only due to the different material type, i.e. paper, but also to the fact that both packaging materials contain drinks or food that are transported by the consumer before or at the same time as consumption. So, in many cases, there may not be an opportunity to rinse the packaging on the go before discarding it in a waste container.

Even fewer people (29%) rinse the lid of takeaway cups, and only 24% of respondents wash the foil that comes with a yoghurt cup. It is an interesting finding that the two parts of the packaging are treated so differently.

The last, *fifth hypothesis* examined the correct waste disposal practices of female and male respondents, using Pearson's chi-square test for statistical correlation. As shown in Table 2 below, no significant difference was found between the gender of the respondents and their correct disposal of different types of waste.

Table 2

Statistical correlation analysis of the distribution of survey respondents using Pearson's chi-square test, by correct or incorrect handling of the specified types of packaging materials and by gender of respondents

Packaging material	χ^2	p	ϕ
Yoghurt foil	1.573	0.21	0.074
Used paper napkin	1.31	0.252	0.066
Cup lid	0.411	0.814	0.037
Used paper handkerchief	0.339	0.561	0.034
Styrofoam	0.148	0.7	0.024
Paper cup for takeaway	0.138	0.711	0.022
Yoghurt/sour cream cup	0.007	0.934	0.005
Paper box suitable for carrying food	0.007	0.934	0.005

Source: own table based on primary research

Based on the results, we must reject the fifth hypothesis based on literature sources, as there was no significant difference between female and male respondents in terms of whether they know how to treat different packaging materials as waste.

Based on examination of the results of the primary research, the following decisions were made regarding the pre-specified hypotheses:

1. **Hypothesis 1:** Students have purchased an electronic device (such as a mobile phone, tablet, laptop, desktop computer or games console), mainly due to lack of money or saving money, rather than environmental concerns. The results confirmed this and therefore we **accepted the hypothesis**.
2. **Hypothesis 2:** Students tend to carry their own plastic bags, paper or textile bags when shopping, as they are very concerned about environmental awareness. The results were confirmed and therefore we **accepted the hypothesis**.
3. **Hypothesis 3:** Students are always aware of how and to which waste bin to dispose of different types of waste such as takeaway drink cups, used tissues and napkins, yoghurt, sour cream cups, styrofoam and cup lids. The results were only partially confirmed; thus, **the hypothesis was rejected**.
4. **Hypothesis 4:** At least half of the respondents were aware that cup lids, takeaway paper cups, paper food boxes, yoghurt and sour cream cups should be washed before being thrown away in the appropriate place. The results did not justify this; therefore, **the hypothesis was rejected**.
5. **Hypothesis 5:** Among those surveyed, women are more aware of where to throw away the products listed in the survey. The results did not justify this; therefore, **the hypothesis was rejected**.

Conclusions

The results of our survey confirm that, although the students in the study say they are trying to be environmentally aware, in many cases this does not happen. This may be due to a lack of information as well as convenience. The research presented at the beginning of this paper suggests that environmental actions requiring less commitment and sacrifice are typically popular among university students. They are reluctant to make significant efforts or sacrifices in the pursuit of environmental goals, even though they have already recognised the importance of protecting the environment and are aware of their responsibilities as the determining generation of the future.

Although our study did not find significant differences in environmental awareness between women and men, the topic requires further investigation due to the limitations of this research. The sample was not balanced between women and men, and we only examined where respondents would throw away packaging materials by their own admission. More detailed studies are probably needed to analyse the extent and nature of the differences in environmental awareness between women and men.

Previous research shows that formal education and ecological knowledge influence environmental behaviour, but this happens in a complex way. In addition, in the case of knowledge-related factors, the importance of what students thought they knew was greater than what they knew. This can easily lead to uninformed decisions regarding environmental awareness, and it is important to take this phenomenon into account in the transfer of environmental knowledge. There is therefore a need to develop not only objective but also subjective knowledge.

A cluster analysis based on a questionnaire survey of the Corvinus University of Budapest students in 2008-2009 illustrates another key challenge in developing environmental awareness: different target groups need different types of support to display a behaviour that is more environmentally conscious in the future. Knowledge-oriented people need to be provided with the appropriate information, consumption-oriented people with environmentally conscious alternatives, environmentally conscious people with positive reinforcement, and neutral groups with newer aspects (e.g. putting emphasis on cost savings through lower consumption).

As it can be seen from previous and current research, the preference for environmental values and the presence of environmental attitudes are typical of Generation Z, but they do not always have the ecological knowledge necessary for environmentally conscious behaviour, and there are significant gaps between willingness to act and actual action. Complex programmes to develop these are needed not only in public education but also in higher education institutions.

Author contributions

All the authors have contributed equally to creation of this article.

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