

SUMMATIVE ASSESSMENT: RESEARCH REPORT

**Assessment of food waste management perceptions and practices of interns at the
Department of Sport, Arts and Culture from various Institutions of Higher Learning in
South Africa**

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List of abbreviations

CGCSA -Consumer Goods Council of South Africa

CSIR - Council for Scientific and Industrial Research

DEFF - Department of Environment, Forestry and Fisheries

DSAC – Department of Sport, Arts and Culture

FAO - Food and Agriculture Organization

SDG - Sustainable Development Goals

Executive summary

This report provides insights on institutions of higher learning students food waste management perceptions, practices and knowledge. Food waste refers to food appropriate for human consumption being discarded, whether after it is left to spoil due to behavioural issues or kept beyond its expiry date (Consumer Goods Council of South Africa, 2020).

Food waste is a considerable sustainability challenge due to its social and environmental impacts, and many institutions of higher learning especially universities around the world are engaged in food waste prevention. Institutions of higher learning offer opportunities for prevention of food.

This paper discusses matters related to government policies university policies and strategies, best practices as well as deficiencies that are seen in preventing food waste.

The reason why the study was conducted was to fill the gap in the literature and examines the perceptions, knowledge, practices and awareness of young consumers (students) from various institutions of higher learning in South Africa about food waste. The sample is students doing internship within the Department of Sport, Arts and Culture. These students are from different backgrounds, households, provinces and studies towards difference qualifications. The study also assessed whether these institutions have put measures in place to create awareness among students to address food waste on campus.

The research study was envisaged to gain insights that will assist the government and institutions of higher learning to increasing awareness food waste management practices among students who should take more responsibility in this issue as future leaders. It is envisaged that food waste awareness raising will contribute to a 'cultural change and making young people more conscious and responsible.

The research was conducted within the National Department of Sport, Arts and Culture in South Africa. Online questionnaire was distributed via email to 57 respondents who are students from various institutions of higher learning doing internship at the department. Convenience sampling was used as the department provided the researcher with database with list and email addresses of the interns. Only 36 respondents completed the questionnaire.

Respondents in the study are from 9 different universities in South Africa which are Tshwane University of Technology, University of Johannesburg, University of Limpopo, University of South Africa, University of Venda, University of Pretoria, University of KwaZulu-Natal, Durban University of Technology and Vaal university of Technology.

The findings of the study showed limited knowledge of food waste management practices among the young people and lack of knowledge on the measures put in place by institutions to deal with the food waste challenge.

It is recommended that institutions of higher learning embark on educational campaign to raise awareness of food waste among students and monitor for a particular time frame to assess the effectiveness of the campaign.

Digital platforms are at the for front as preferred communication platforms by the young people and for reaching the broader population, however integration of both digital and traditional media is key for government and institutions of higher learning as target audience are generation z and millennials who are always online.

Website and social media marketing plays a significant role in creating awareness of food waste management among the youth as well as enabling student's engagement and participation.

The study reveals that even though food waste is as an essential issue in many institutions of higher learning, prevention efforts are not so widely spread as they should be.

It is recommended that further investigation be conducted to test the generalisability of results with similar constructs with larger sample size with participation of all universities in the country.

Title of the Research Study

Assessment of food waste management perceptions and practices of interns at the Department of Sport, Arts and Culture from various Institutions of Higher Learning in South Africa

Introduction and context of the study

Food waste is a recognised global issue, which is also affecting South Africa. Food waste refers to any food that is safe for human consumption and discarded. Furthermore, food waste refers to the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers (Food and Agriculture Organization, 2019). Food waste occurs at various levels of the food chain, and in various institutions and sectors of society (Agbedahin & Agbedahin, 2019). Food produce that is lost along the supply chain before it reaches the consumer as well as food that is thrown away by consumers is a global challenge (University of Johannesburg, n.d). Food waste is generated in large amounts across the food chain resulting in serious social, economic and environmental consequences (Bishop & Megicks, 2018), in both developing and developed countries (Abdelaal, McKay and Mackey, 2019). Similarly, Kim, Rundle-Thiele and Knox (2019) assert that food waste is a systemic problem, with waste occurring at all stages in the supply chain and consumption process.

CGCSA (2022) asserts that food waste comes with food insecurity. Kaur, Dhir, Talwar and Alrasheedy (2021) attest that food waste threatens the environment. This is due to the fact that food waste produces methane gas (Bishop & Megicks, 2018) when it gets spoiled, which contributes significantly towards of global warming problem (Bishop & Megicks, 2018). According to United Nations Environment Programme (2021) estimates suggest that 8-10% of global greenhouse gas emissions are linked with food that is not consumed, thus contributing to climate change (University of Johannesburg, n.d).

Aktas, Sahin, Topaloglu, Oledinma, Huda, Irani, Sharif, van'tWout and Kamrava (2018) and the CGCSA (2022), further assert that food waste is closely associated with food security as well as economic and environmental impacts, and lowering it could help feed more people, and also alleviate the pressure on natural resources as well as mitigating the negative impact on environment from greenhouse gas emissions of food chain operations. Additionally, Burlea-Schiopoiu, Ogarca, Barbu, Craciun, Baloi and Mihai (2021) state that food waste is seen as a waste of resources, which could be used to alleviate the hunger problem facing hundreds of millions of people in the world. According to University of Johannesburg (n.d) in developed countries food waste generally takes place on the consumer side, while in developing countries food waste occurs largely along the supply chain due to constraint in technologies such as storage and cooling, but also due to logistics.

Department of Environment, Forestry and Fisheries (DEFF) and Council for Scientific and Industrial Research (CSIR) (2021) there is a great opportunity to prevent and manage food waste throughout the food supply chain but specifically in the consumption stages of the Food Supply Chain through behaviour change, education and awareness.

Consumers generate food waste by failing to consume purchased food, while retailers contribute to food waste by overstocking. These contributions to food waste could potentially be avoided through changes in consumer behaviours and business practices (Ahmed, Shanks, Lewis, Leitch, Spencer, Smith, & Hess, 2018). Statistics on food waste in South Africa are scant. CGCSA (2022) reported that an estimated 10.3 million tonnes of food and beverages is wasted per year in South Africa, about a third of the food available, yet 9.34 million people in South African suffer from acute food insecurity and almost 20% of South African households have insufficient access to food (Özdemira & Güçerb, 2018). Around 90% of waste in SA is disposed of to landfill and at times the food is still safe for human consumption CGCSA (2020). Therefore, reducing food waste is key in achieving sustainability in the food supply versus the demand. Bishop and Megicks (2018) state that wasteful behaviour in the developed countries consistently affects the food availability in the developing countries. Food wastage is a leading contributor to pervasive world hunger (Ang, Narayanan & Hong, 2021). Food waste is problematic on many levels as people go to sleep hungry daily, yet other people waste food. Food waste phenomenon in institutions of higher learning, seemingly, has not been in the spotlight. Food waste especially universities, arises in very complicated circumstances and means different things to different people (Agbedahin & Agbedahin, 2019).

The South African government is a signatory to the United Nations Sustainable Development Goals (SDG) Target 12.3 sets out to reduce food waste by 50% by 2030 (DEFF & CSIR, 2021). Non-governmental Departments such as universities among others have a vital role to play in assisting government to attain the SDG of halving Food Waste by half by 2030 (CGCSA, 2020).

The Department of Sport, Arts and Culture and other government departments led by DEFF are meaningful brands to address the challenge of food waste in South Africa and other countries as policy makers. Burlea-Schiopoiu et al. (2021) policy makers should capture the momentum and develop policies that take advantage of young people's receptiveness towards new information and knowledge. According to Lloyd (2017) a brand to be truly meaningful it must have a positive impact on societal well-being and must exude meaning and elicit emotion from its core. The brand must enhance the vibrancy and vitality of what consumers feel in day-to-day lives. No adequate improvement in food waste related issues is achievable if the entire food economy of an organization, nation, or world is not factored in. According to CGCSA (2020) as the legislators, government can pave a way to close the gap between food wasted and loss, and malnutrition. Is

important for government to collaborate with public institutions like universities due to their role in educating a future generation and their impact as a liveable organisation contributing to food waste, and that is the reason for selecting institutions of higher learning students doing internship in a government department as a focus of this study. The government and universities have a brand identity just like any other public or private organisation or restaurant. Institutions of higher learning, particularly universities, should become the primary site for teaching about food waste and its implications (Agbedahin & Agbedahin, 2019).

The understanding and analysis of perceptions and practices that lead to food waste among the youth, particularly the generation z and millennials cohort is vital as insights will assist government and institutions of higher learning in planning and implementing measures to curb food waste. When people are doing studies they focus on a particular institution of higher learning looking at practices, attitudes, beliefs, knowledge of that one institution of cohort. This study fills the gap in the literature and examines the perceptions, knowledge, practices and awareness of young consumers (students) from various institutions of higher learning in South Africa about food waste through students doing internship within government department. These students are from different backgrounds, households, provinces and studies towards difference qualifications. The study also assess how were these various institutions creating awareness among students and measures they have put in place to address food waste on campus.

According to Filho, Salvia, Davis, Will and Moggii (2021) food waste prevention has become an essential topic in higher education institutions globally in part due to its social and environmental impacts. However, these institutions have not implemented adequate rules or taken other steps to prevent it from increasing (Börühan & Ozbiltekin-Pala, 2022). Furthermore, prevention efforts are not so widely spread as they should (Filho et al., 2021). Burlea-Schiopoiu et al. (2021) state that there is not much research on how students perceive food waste. Institutions of higher learning need to better understand the consumer behaviours on food waste and the essential factors that encourage food waste minimisation behaviours and practices. Institutions of higher learning can utilise policy instruments to establish an aspirational philosophy of zero-waste throughout the institution to act against adverse environmental impacts and costs of waste disposal (Ebrahimi & North, 2017). There have been efforts made to decrease food waste around the world. However, the issue still persists and it needs more attention and responsibility from food organizations, governments and consumers, respectively (Chang, Lim & Cheah, 2021). There is scarcity of data in current literature regarding the extent of food wastage and its management within institutions of higher learning in South Africa. This serves as further motivation to determine the reasons behind this predicament in order to put mitigation factors in place, hence this study.

Additionally, there is a more general goal to reduce food waste and losses along food supply chains. Therefore, it is expected that there will be an increasing number of initiatives and legislative developments in order to reach these objectives. Chapter 5 of the South African National Developmental Plan (NDP) on Environmental sustainability and resilience further refers to the challenges associated with responsible consumption and preservation of our natural resources (South African Government, 2012).

Research Goal and Questions

The purpose of the study

The purpose of this study was to analyse food waste knowledge, perception, and practices of students from various Institutions of higher learning in South Africa. The focus was on the factors contributing to food waste by students; students' behaviour and beliefs towards food waste, and establish student's knowledge, understanding and awareness of food waste. Moreover, also establish whether food waste reduction messages were displayed in the institutions premises and communicated on institutions' online platforms such as the website.

Research questions

Filho et al. (2021) argues that since many universities are concerned with sustainability issues, they should also be active in the prevention of food waste. The empirical part of the research is concerned with these researchers' viewpoint. More specifically, the study also departs from the following set of research questions that will guide the research process towards meeting the research aim.

- (1) What is the nature of collaboration between government and institutions of higher learning?
- (2) What measures has universities put in place to reduce food waste on its campus?
- (3) How do students contribute towards the prevention of food waste?
- (4) What types of food do students leave on their plates?
- (5) What are students' perceptions toward food waste?
- (6) What is the degree of student's knowledge and awareness regarding the impact of food waste on the environment?

Background and the rationale of the research

Food waste is a recognised worldwide issue which is also affecting South Africa. UNEP (2021) states that reducing food waste at retail, food service and household level can provide miscellaneous benefits for both people and the planet. However, the exact scale of food waste and its impacts have not been well understood until now. More importantly, there is a global goal of reducing food waste by 50% by 2030, and every individual and organisations are requested to

participate because their efforts to reduce food waste is valued and can help achieve this goal through the Food Waste Challenge (Alcorn et al., 2020). Food and Agriculture Organization (2021) attests that with eight years left to reach the target, the urgency for scaling up action to reduce food loss and waste cannot be overemphasised. The necessity of the study comes from the fact that the high volume of South Africa's food losses and waste (68%) unfolds in the early stages of production with 19% occurring during post-harvest handling and storage and 49% during processing and packaging, while food waste at the consumption stage is 18% (Council for Scientific and Industrial Research, 2021).

From an ethical perspective, there is simply no room for food waste (Consumer Goods Council of South Africa, 2020). Reducing food waste is a key objective for meeting sustainability goals of organizations around the world. In South Africa, the National Waste Management Strategy (NWMS) 2020, as part of Government's strategic priority to minimise waste to landfill by 45% by 2025, has identified food waste as one of the critical areas that require intervention (Creecy, 2022). Accordingly, Burlea-Schiopoiu et al. (2021: 2) define responsible behaviour of the young people towards food waste as *'being the rational process of being aware of the possibility of food waste and the active actions that one takes in order to avoid food waste.'* It is a fundamental step to manage the issue of food waste from educational institutes (Abdelaal et al., 2019). Institutions of higher learning contribute to generation of food waste while serving as models in championing sustainability solutions (Ahmed et al., 2018). For universities to succeed at food waste management initiatives toward increased sustainability, various stakeholders, including students need get involved where each role player has set directions, goals and objectives (Ebrahimi & North, 2017). By increasing awareness of food waste and its economic, societal and environmental impact in South Africa, restaurant operators in universities have the opportunity to motivate cafeteria employees and students to reduce dining halls food waste. It is also vital for managers to explore various waste reduction practices and strategies. However, to be in a position to make informed decisions on food waste reduction strategies to implement, operators should understand the factors influencing food waste generation (Alcorn, Vega, Irvin & Paez, 2020).

Literature review

Food waste occurs in every stage of the supply chain, but the value-added lost to waste is the highest when consumers waste food. According to Jamaludin, Mohamed and Noorashid (2020) food waste includes food and food preparation leftovers generate from various sources such as residences, restaurants, and school and university cafeteria. Aktas et al. (2018) assert that food waste occurs more frequently downstream the supply chain, specifically at the retail and

consumption stages. This is because the consumption stage of the supply chain, which includes consumption at household level, and in the hospitality sector where food is prepared and served out of home which includes the commercial service sector (restaurants, fast food outlets, hotels and cafés in the formal sector) and the institutional service sector (universities, prisons, school and hospitals and work cafeterias) DEFF & CSIR, 2021). Maraisa, Smita, Koena, and Lötzeb (2017) assert that food waste is influenced by consumer behaviour. Food wastage can be categorised as avoidable wastage for food which was edible prior to disposal or before being spoiled. However, possibly avoidable wastage depends on personal preference and other factors such as health concerns.

The food wastage behaviour involves all layers of life, including the generation Z or the youth segment of the population. The lack of recognition and consideration by youths that food waste is unethical is a worrying trend (Jamaludin, Mohamed & Noorashid, 2020). Food waste at the consumer end has the highest economic, social and environmental impacts because of its value-added lost, the opportunity cost of not being able to feed other people who might be living in hunger and poverty, and the loss of natural resources, biodiversity and other resources such as energy and labour (Aktas et al., 2018). Food waste also adds to the cost of food for consumers because the extra resources required to compensate for those losses need to be covered by farmers, fresh produce markets and supermarkets (University of Pretoria, 2021). Moreover, Mabaso and Hewson (2018) argue that the fact that environmental concerns, and the concerns that are associated with food shortages somewhere else in the world, tend to have relatively little weight placed on them indicates that the link between food waste and impact on environment is not firmly recognised in people's minds.

To reduce food waste by consumers, it is important to understand the factors associated with attitude to food waste amongst consumers. According to Ang et al. (2021) understanding individual behaviour provides better insights on how to minimise food waste than merely starting with the notion that saving food is better than wasting it. To promote food waste reduction, prospective factors that might influence utility from saving food or throwing it away need to be identified. Thus, understanding the behaviour and personality traits of individuals is extremely important to manage food waste crisis effectively and efficiently.

Aktas et al. (2018) assert that attitude to food waste among consumers is mainly associated with buying more than what can be consumed due to promotions and discounts, as well as impulse buys when consumers engage in unplanned purchases. Additionally, social gatherings result in higher levels of food surplus as one may wish to show their hospitality by serving more food than required, and often what is not consumed contribute to food wastage (Aktas et al., 2018). These facts show the necessity of informing and educating customers for more conscious consumptions.

Özdemira and Güçerb (2018) share the same sentiments, stating that it is vital to understand the customers' consumption preferences, their habits, needs and wants in order to mitigate the food waste resulting from customer-based reasons. According to Stangherlin and Barcellos (2018), avoiding food leftover from the entire supply chain including consumption phase and preventing avoidable food to be discarded, is the most favourable solution. To do so, it is crucial to comprehend behaviours that can certainly prevent the final food wastage. The positive relationship from attitudes suggests that if one feels bad when uneaten food is thrown away, then they will have a higher intention to reduce food waste. If one perceives the prevention of food waste as difficult, then they will have lower intentions to reduce food waste (Aktas et al., 2018).

Furthermore, to address pressing need of reducing food waste for sustainability, major international and national organisations have introduced campaigns to reduce food waste. The United Nations Sustainable Development Goals call for the world to reduce food waste by 50 per cent per capita by 2030 (Ahmed et al., 2018). Ang et al. (2021) assert that cutting global food waste in half by 2030 is one of the United Nation's top priorities. According to DEFF and CSIR (2021) it is generally accepted that developed countries like Europe and the United State waste more food at the consumer stage of the supply chain while developing countries in Asia and Africa generate more food waste at the early stages of the supply chain, on farm and during packaging and processing. Food waste reduction is important for contributing towards achieving the sustainable development goals (SDGs) hence the South African government has signed up to SDG 12.3 to reduce food waste by 50% by 2030 (DEFF & CSIR, 2021).

According to CSIR (2021) an estimated 10.3 million tonnes per annum of edible food, earmarked for human consumption in South Africa, does not reach the human stomach, which is about 34% of local food production, but because South Africa is a net exporter of food, the losses and waste is equivalent to 45% of the available food supply in the country. These results point to high levels of inefficiency in the food value chain in South Africa, at a time when there is increasing food insecurity in the country. However, even though this gives a national pattern, it is important to understand and know what is the contribution of institutions of higher learning towards addressing the issue of food waste by disseminating information and creating awareness among students.

Food service operations, including dining halls that are part of institutions of higher learning, have the capacity to reduce food waste at an institutional scale and thus play a notable role in the Food Waste Challenge (Ahmed et al., 2018). Institutions of higher learning are tasked with building student skills including their overall capacity to contribute to transformational societal

change toward more sustainable food systems (Ahmed et al., 2018). According to Maraisa et al. (2017) the attitude of students regarding food consumption and food waste, for instance at times students pre-ordered meals and fail to collect, does contributing to food waste. Despite the significant impact that universities have on food waste generation and prevention, little is still known on the extent to which food waste is handled on the campuses (Filho et al., 2021), and what measures are being put in place by the institutions of higher learning in an attempt to prevent and reduce food waste and its impact on the environment. Understanding the factors which affect consumers' food waste behaviour could aid develop strategies and policies for food waste reduction in universities.

Problem statement

Food waste is a global phenomenon that has environmental, societal, and economic impact. To this extent, institutions of higher learning have a social responsibility to manage food waste through strategic practices, policies, educate students and change behaviour positively.

The fact that significant amounts of food are produced but not eaten by humans has extensive negative impacts environmentally, socially and economically (FAC, 2019). Government, organisations and institutions such as universities has a vital role to play in addressing the food loss and food waste challenge. Students, unlike other young people possess several characteristics which influence their food waste behaviour, such as level of education, buying habits, lifestyle as well as their eating and storing food, especially when studying away from home (Burlea-Schiopoiu et al., 2021). Food waste is a considerable sustainability challenge, and university canteens can offer opportunities for prevention of food waste. Literature reveals that even though food waste is as an essential issue in many institutions of higher learning, prevention efforts are not so widely spread as they should be.

Research approach and methodology

This research applied the case study survey approach to determine the contribution of institutions of higher learning in addressing food waste problems among their students. The study focused on identifying the gaps in the existing literature on food waste with a view to make a contribution to the body of knowledge that could improve the management, practices and knowledge of food waste among students at institutions of higher learning in South Africa.

To this end, the study utilised quantitative approach to investigate the current food waste management knowledge and practices among the interns based at the Department of Arts and Culture, who are from various university across the country. This approach was informed by the statement made by Creswell and Plano-Clark (2018) that qualitative data provide a comprehensive understanding of a problem while quantitative data provide a more general

understanding. Qualitative understanding arises out of studying a few individuals and exploring their perspectives in great depth, while the quantitative understanding arises from examining a large number of people and assessing responses to a few variables. So, in this study was to determine the contribution made by institutions of higher learning in the effort to prevent and control food waste by students.

A research project requires a foundation that can articulate, support and validate a research approach, and be aligned to particular paradigms which in turn inform the research design and research methods (Bogna, Raineri & Dell, 2020). Du Plooy-Cilliers, Davis and Bezuidenhout (2014) assert that by following a particular paradigm or research tradition, researchers adopt a particular way of studying phenomena pertinent to their field. Paradigm is a set of basic and taken-for-granted assumptions which underwrite the frame of reference, mode of theorising and ways of operating in which a group functions (Saunders, Lewis & Thornhill, 2019). There are various types of paradigms in research, which include, but are not limited to Pragmatism, Interpretivism and Positivism (Alharahsheh & Pius, 2020). However, in this study, Positivism was applied.

Positivism paradigm

Du Plooy-Cilliers et al (2014) define positivism as the approach of the natural sciences. According to Saunders et al. (2019), positivism relates to the philosophical stance of the natural scientist and involves working with an observable social reality to produce law-like generalisations. The researcher tries to remain neutral and detached from the researched in order to avoid influencing the findings and would undertake research in a value-free way. Positivism is a paradigm of inquiry that searches for "the truth" of facts about reality. Within positivism there is a belief that there is an objective, constant reality that exists and can be measurable. The researcher maintains distance from the researched in order to prevent any influence on the results. Positivism like any other research paradigm has its own limitations, Alharahsheh and Pius (2020) state that the methods used in positivism to further understand the natural world are not always transferable to the social world, therefore, it can be viewed as having some limitations. For this study Positivism Paradigm was used the gain insights on universities' waste management practises as well as student's perceptions and awareness regarding food waste and its impact of the environment.

Research approach/method:

Research methods are more related to the collection and analysis techniques used for data to produce and develop knowledge. There are two types to be adopted either quantitative or qualitative research. However, mixed methods can be also used in some cases (McDaniel & Gates, 2015).

Quantitative research was used to achieve the research objectives and gain insights on student's perceptions, practices, and awareness of food waste. Positivism largely applies quantitative techniques.

Quantitative research

Quantitative research designs are generally associated with positivism, particularly when used with predetermined and highly structured data collection techniques (Saunders et al., 2019).

Quantitative research involves collecting data from relatively large sample, the data collected are usually presented as numbers, often in tables, on graphs and on charts (McGivern, 2013). Burns and Bush (2014) define quantitative research as research involving the administration of a set of structured questions with predetermined response options to many respondents. Saunders et al., (2019) state that quantitative is often used as a synonym for any data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data. In quantitative research, a survey strategy is normally conducted using questionnaires or structured interviews or, probably, structured observation.

Population, Sample and Sampling Strategy

Target group sampling consists of 57 students of both genders in Generation Z and Millennials cohort (18 – 25 and 26 - 41 years of age), as majority of university students and those who have just finished their studies. Kamenidou, Mamalis, Pavlidis and Bara (2019), emphasises that it is of great importance to comprehend sustainable food choices, diets and consumption behaviours of the Generation Z cohort university students, as this segment will be future parents as well as educational, social, financial and political elites that will shape the sustainable consumption and development policies of future societies. University students are suitable for academic research to analyse food waste due to the fact that they have the potential to answer self-reported questions, to evaluate complex behaviour and to provide reliable data (Knezevic, Kurnoga & Anic, 2019).

Convenience sampling was used to collect data from the study participants. Convenience sampling is a method in which samples are drawn based on convenience, this method enables a large number of respondents to be interviewed in a relatively short time (Hair, Ortinau & Harrison, 2021). The study participants were sampled from the list of interns who are stationed at the Department of Sport, Arts and Culture. The researcher sent a request to all the interns and waited for the response. After receiving the response from the interns indicating their willingness

to participate, the researcher began interacting with them on the various elements of the research, including the consent form and the research process.

Data collection method(s)

An online questionnaire was used to collect data in this study. Questionnaire is a structured technique for data collection that comprises of a series of questions which are written or verbal that a respondent answers (Malhotra, 2020). It is used to collect the data for the research, and it contains a list of questions designed to gather the data necessary to accomplish the objectives of the research project. It can be referred to as a formalised schedule for collecting information from respondents (McDaniel & Gates, 2015).

Malhotra (2020) indicate that the questionnaire needs to fulfil the following three specific objectives as part of the data collection process:

1. It must translate the information needed into a set of specific questions that the respondents can and will answer.
2. A questionnaire must uplift, motivate, and encourage the respondent to become involved in the interview, to cooperate, and to complete the interview.
3. A questionnaire should minimize response error.

The survey utilised both closed and open-ended questions. Regarding the closed- ended questions, the respondents were requested to choose from a fixed set of answers. However, for open-ended questions, the respondents were allowed freedom to offer any other comment, they wished state in relation to food waste management.

A self-administered questionnaire in which the respondent takes the responsibility for reading and answering the questions without having them stated orally by the researcher or an interviewer were used. The questionnaire was distributed to a potential respondent through e-mail as a link with the covering letter on the body of the email. Respondents were given general information on how to fill out the questionnaire and were expected to fill it out on their own (McDaniel & Gates, 2015). To complete the online questionnaire, a respondent must open the questionnaire via the link and respond to questions in various formats such as radio boxes, multiple choice, drop-down menu where the select appropriate answer and areas to type in short answer / or add more moments if any, once completed the respondent has to click the submit button the save and submit the questionnaire. Strength is that interviewer and associated biases are eliminated; respondent can complete the questionnaire when convenient; respondent can look up information and work at own pace. Weakness is that there is no interviewer to show, explain, or probe; sample may be poor because of nonresponse; who actually completes the

questionnaire cannot be controlled (McDaniel & Gates, 2015). Hague, Harrison, Cupman and Truman (2016) states that the biggest shortcoming is that they generate low and uncertain response rates if the audience is not highly engaged. Low response rates are one of the most serious problems that plague regular mail surveys. The questionnaire link was sent via email to 57 participants and only 36 completed the online questionnaire.

The insights provided by university students are crucial for developing effective waste reduction initiatives or mitigation through awareness campaigns and design of new policies, collaboration between government, institutions of higher learning and other stakeholders to enhance current food waste management procedures at the student level and society at large.

[Analysis of data and findings](#)

Quantitative analysis

Quantitative researchers establish credibility in data analysis by demonstrating that their results are reliable, ensure that measurement and findings are stable, repeatable, and generalizable and valid as the research measures what it was intended to measure (Hair et al., 2021).

This study utilised google forms questionnaire and it used Google Sheets to analyse the data. Descriptive analysis, which includes frequencies and cross-tabulation was used.

The data were analysed using descriptive and correlation analyses, with support of the google forms spreadsheet report. First, descriptive analysis explored basic characteristics of the institutions students attended, provinces they come from, year they completed their studies, qualifications, age groups, race, internship cycle.

Secondly, a correlation analysis was conducted in order to examine any underlying similarities or differences among the awareness of food waste, perceptions, engagement in and support to food waste prevention measures.

Qualitative analysis

Data from the open-ended question were assessed through content analysis. According to Filho et al. (2021) this technique involves reading and interpreting the material progressively and systematically, in order to categorize useful information for gathering essential insights from many different discourses.

The different categories of analysis were clustered according to similarities in the answers provided by the respondents and organised following the steps of food waste management, as presented in the literature review.

The additional space for any other comments at the end of the survey also provided interesting topics that were brought to the qualitative analysis

Reliability, Validity and Generalisability

Reliability

According to Cooper and Schindler (2014) reliability has to do with the accuracy and precision of a measurement procedure and results should be free from errors. Reliability will be ensured by utilising university student's database to obtain the study participants. Therefore, it can be assumed that the responses will be from only registered students.

Validity

Validity is the extent to which a test measures what the researcher actually wish to measure (Cooper & Schindler, 2014). As a result of the nature of the study, a pilot study will be conducted outside the study area to test the questionnaires to ensure the data collection is valid, consistent and reliable.

Generalisation

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Bias

The study utilised online questionnaire which eliminates interviewer bias as respondents read the questions and take their time to think and provide answers. This stands in contrast to an administered interview where there is a possibility that the question may not be read out in full or it could be misheard by the respondent. In an online survey the respondent can look over a list of points of consideration that would be difficult if not impossible to read out over the telephone (Hague et al., 2016). Bias tendencies were eliminated and managed accordingly to a certain degree. The sample was conveniently selected from the departmental internships database list. There was no discrimination based on race, gender, age, educational level or position. Biased wording was also eliminated from the phrasing of questions to ensure that there is no distortion of responses in one direction.

Feasibility of the study

Approval to conduct the research at the Department of Sport, Arts and Culture was very vital for the research to be undertaken as it implied that the proposal was satisfactory.

Once permission was granted to researcher was able to conduct the research within the tight timeframe. The utilisation of convenient sampling assisted the researcher to gain access to participants and collect the data. The proposal required resources that were readily available with no financial implications, and the researcher has the necessary skills to conduct the research under supervision of assign supervisor.

In the nutshell the proposed research is achievable within the time and available resources as it will be conducted online utilising online questionnaire. Target population managed to complete the online questionnaire on their own. The researcher has resources necessary to conduct the study and analyse data.

Ethical consideration

According to McDaniel and Gates (2015) today's business ethics are a subset of the values held by society. A researcher with a mature set of ethical values strives for high level of professionalism and accepts personal responsibility for decisions that affect the community.

The following ethical issues were taken into considerations during the research process:

Researcher upholds values and standards by ensuring the ethical conduct which includes integrity and truthfulness.

The study commenced after ethics approval has been obtained from the Research and Ethics Committee of the Vega School. Permission to conduct the study was sought from the National Department of Sport, Arts and Culture and was granted by the Director General of the department. No conflict of interest on the part of the researcher was anticipated in this study.

Consent was acquired from the study participants before participating in the study. Ensured that participants were informed about the purpose of the research study prior to their participation, in the body of the email that was disseminated to participants as well as in the consent form that was attached on the email. Privacy and confidentiality will always be kept, with all the consent forms and any information supplied by the study participants will be properly secured. The study participants were not forced to participate and were informed that their participation is merely voluntarily and that they can stop participating in the study at any time. Participants were informed of the confidentiality of the information and no personal details of participants were requested. Participants were informed upfront that the research finding might be shared with the relevant department if required. Inclusion and exclusion criteria was based on the internship intake from 2021 -2022 and 2022 -2024. Only students or interns from various Institutions of

higher learning within the National Department of Sport, Arts and Culture were allowed to participate in the study.

Assumptions

The assumption is that the target audience will be able to complete the questionnaire on their own. It is also assumed that the respondents are familiar with food waste in general. It is assumed that the study will provide insights on the factors that contribute to food waste in academic institutions especially the youth. It is also assumed that it will highlight attributes of consumers with regards to food waste. Lastly will enhance the institutions food waste management practises.

Limitations of the study

This study, like other research studies, has limitations. The major limitation of this research is related to targeting a particular number of students who are interns in a government department as opposed to all registered university students in South Africa.

Another limitation is that unlike physical presence of the researcher when the questionnaire is being completed, online completion of the questionnaire would not offer the researcher the opportunity to check if the questionnaire has been completely and correctly completed, and to make an immediate follow up. That said, online completion of the questionnaire could result in returned questionnaire that are not correctly completed, and the researcher will not have a chance to make follow ups.

Delimitations

The delimitation is that the participants in this study are students doing internship at the National Department of Sport, Arts and Arts and Culture and the database list was provided by the department.

Pilot study

Initially, to ensure that the questionnaire was properly designed, clear, with relevant questions and easy to answer within stipulated time, it was pilot-tested with few students from various institutions of higher learning sourced through WhatsApp groups before it was disseminated to sample population to validate the research topic and questions.

Anticipated contribution of the study

This research will encourage government and universities in the South Africa and other developing countries to develop policies that are promoting the prevention of food waste on their respective campuses. More specifically, the results of the research will encourage universities and other institutions of higher learning to raise awareness among their students and personnel

about prevention of food waste. This study could identify critical aspects that can potentially become future research areas.

Results and Discussion

Once the research design, plan and sample population has been outlined and the appropriate research methodology selected, it is then befitting to commence with the research to obtain valid and reliable results within the allocated timeframe.

The research findings are stimulated here as they respond to the research aims and questions.

Summary of key insights per research question

Response rate and demographics

The researcher used convenience sample of students who are doing internship from the Department of Sport, Arts and Culture from various universities in South Africa.

The online self-administered google forms questionnaire was shared with Fifty-seven (57) potential participants of both genders through email. The respondents were informed that their participation was completely voluntary and that they could choose not to participate. Participants we requested to complete a concerned form prior to participation.

Only 36 respondents completed and submitted the questionnaire; therefore, indicating 63.1% response rate. It can, therefore, be assumed that the survey is representative of the students, however no generalisable statements about the entire population of students in various universities in the country can be made. The survey received responses from interns from 9 different universities as shown in Figure 6.5. this universities are located in 4 different provinces in the country.

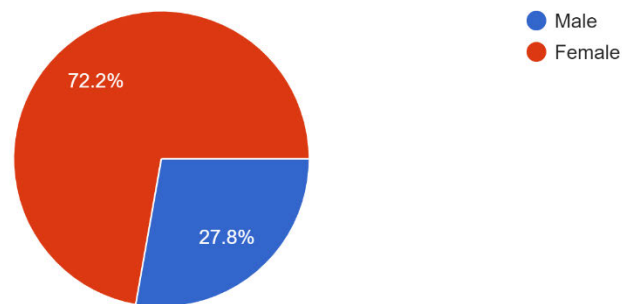
Demographic Profile

The profile of the participants was analysed in terms of gender, age group, race, province, name of institution of higher education, and qualification. The results are presented in tables and graphs below.

Of the 36 respondents, 27.8% were male and 72.2% respondents were female.

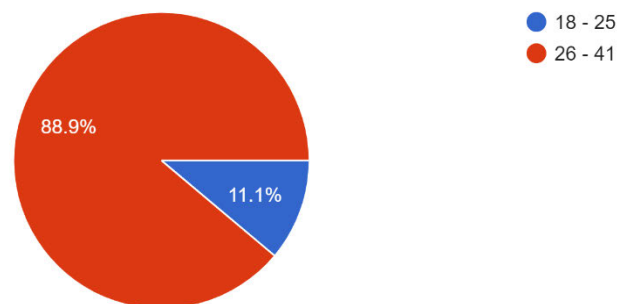
DEMOGRAPHIC PROFILE 1. Gender

36 responses

**Figure 6.1: Gender**

2. Age Group

36 responses

**Figures 6.2: Age Categories**

The respondents age groups ranged from 18 to 25 (Generation Z) and 26 to 41 (Millennials) years. The age group of 18 to 25 represents the smallest age group of the respondents at 11.1%, and the largest age group of 25 to 41 with 88.9%.

3. Population group

36 responses

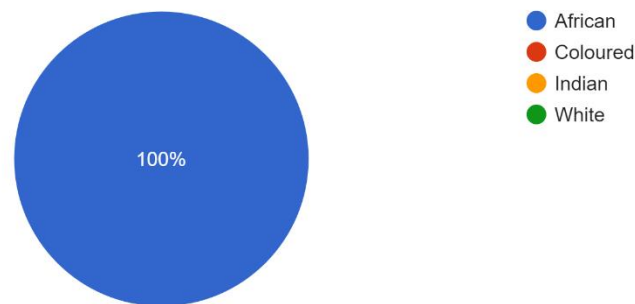


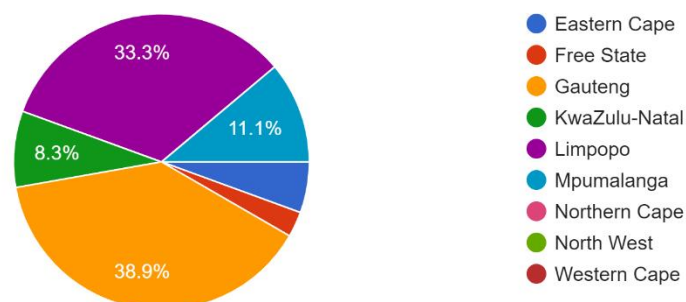
Figure xxx: Population Categories of the respondents

Figures 6.3: Population Group

All of the population group of people that participated in the study were 100% African with 0% participation of other races, however out of the 57 database of interns within the Department of Sport, Arts and Culture, 56 are African with only 1 coloured. This is not surprising as according to Galal (2022) in the first quarter of 2022, the unemployment rate among Black South Africans reached 38.6 percent, Coloured reached 25.9, Indian reached 17.1 while white South Africans reached 10 percent.

4. Which province are you from?

36 responses

**Figures 6.4: Provinces**

The majority of respondents are from Gauteng at 38.9% followed by Limpopo at 33.3%, Mpumalanga at 11.1%, North West at 8.3%, Eastern Cape at 5.8% and Free State at 2.8% and lastly 0% respondents from remaining two provinces.

5. What is the name of the Institution of Higher Learning you are attending or have attended?

36 responses

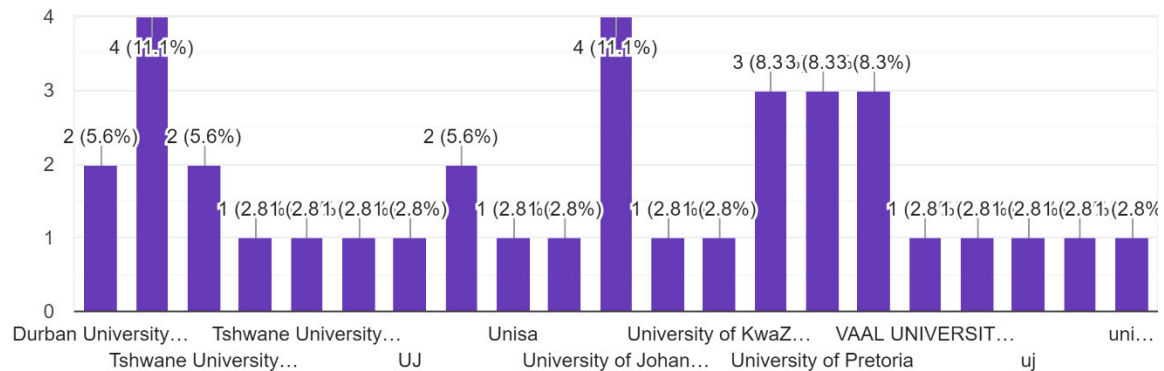


Figure 6.5: Respondents Institutions of Higher Learning

Respondents in the study are from 9 different universities in South Africa with 9 from Tshwane University of Technology (highest participants), followed by 7 from University of Johannesburg, 4 from University of Limpopo, 4 and from University of South Africa, 3 from University of Venda, 3 from University of Pretoria, 2 from University of KwaZulu-Natal, 2 from Durban University of Technology and lastly 2 from Vaal university of Technology.

6. What is the name of your qualification? (Please specify)

36 responses



Figure 6.6: Qualifications

Participants are from different faculties and qualifications however their food waste perceptions, knowledge and practices are more or less similar irrespective of qualifications.

7. Year completed

36 responses

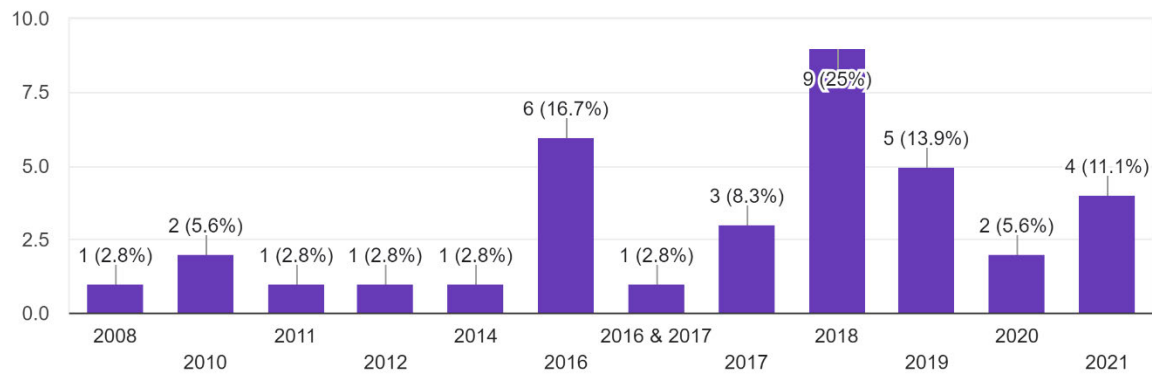


Figure 6.7: Year completed

Based on the data analysis, respondents who completed their studies recently have a bit of food waste knowledge or awareness as compared to those who completed over 10 years ago.

8. Internship cycle in the Department of Sport, Arts and Culture

36 responses

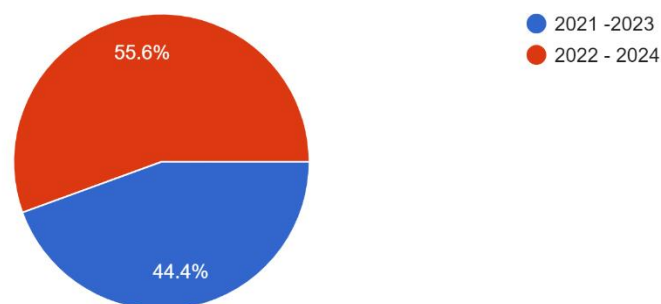


Figure 6.8:

Based on the content analysis of respondents, interns from both internship cycles have similar perceptions when it comes to food waste.

Students' contribution towards the prevention of food waste

9. Do you avoid generating food waste?

36 responses

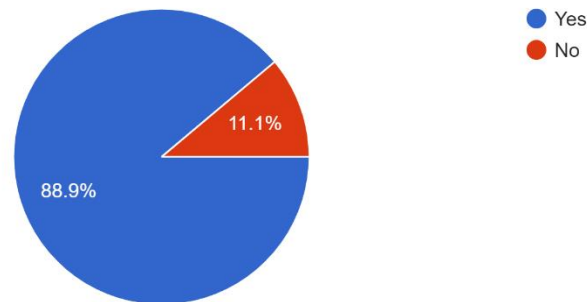


Figure 6.9: Food waste avoidance

88.9% of respondent sighted that the avoid generating food waste and interestingly of the 11.1% of respondents who sighted that they do not avoid generating food waste most of them are males.

10. What do you do to avoid generating food waste? (Please tick whichever is applicable)

36 responses

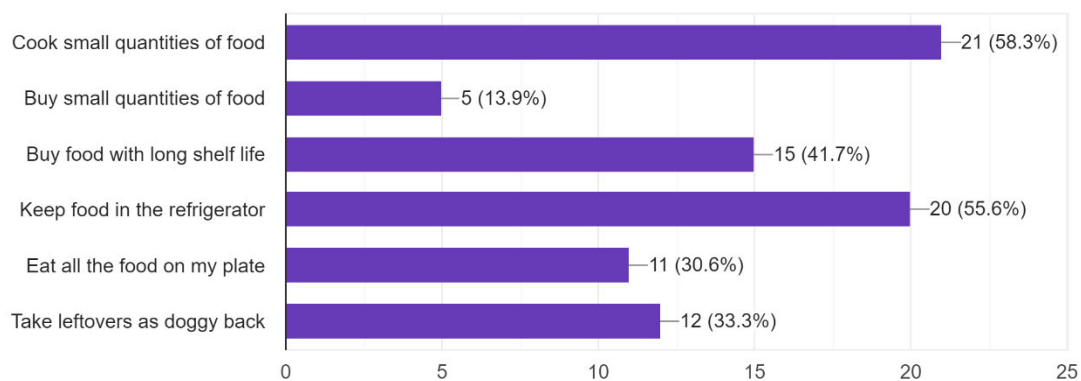


Figure 6.10: Efforts taken to avoid food waste

Based on the level of participation in efforts taken to reduce food waste it is evident that across both age groups irrespective of the faculty or qualification, respondents try to some degree to combat food waste with majority sighting that they cook small quantities of food as well as keeping food in the refrigerator.

In support of this findings Burlea-Schiopoiu et al. (2021) define responsible behaviour of the young consumer towards food waste as being the rational process of being aware of the possibility of food waste and the preventative actions that one takes in order to avoid food waste.

11. What food prepared by institution / university's cafeteria did you leave uneaten or unfinished on your plate?

31 responses

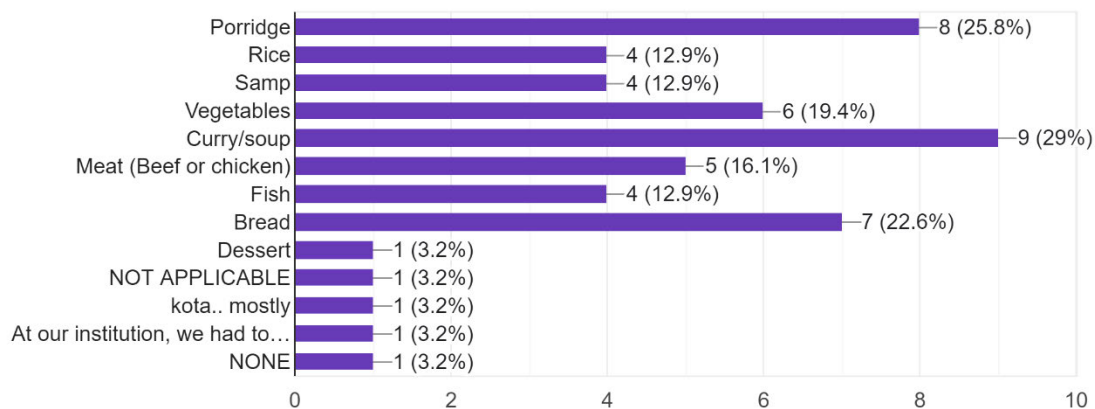


Figure 6.11: Cafeteria Food that is left uneaten or unfinished on the plate

Most of the food left uneaten or uneaten were curry/soup, porridge, bread and vegetables. The least wasted was dessert. Respondent from Durban University of Technology indicated that they had to self-cater so they could not waste food. This brings to light the issue of dinning wall / cafeteria food waste verses self-catering.

12. Institution's food portion size

35 responses

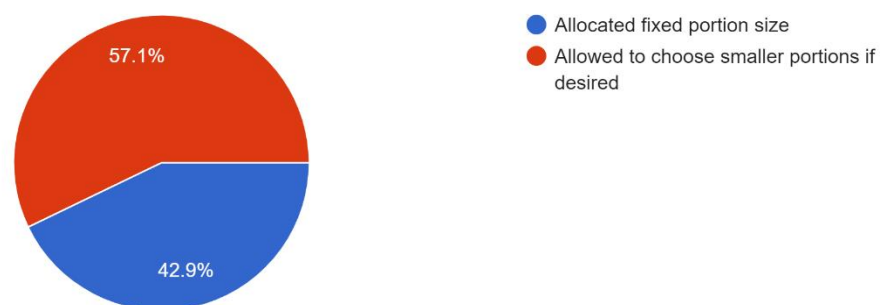


Figure 6.12:

57.1% of respondents indicated that their universities allowed them to choose smaller portions if desired. This is an indication that some universities have put in an effort to reduce/control portions and consequently minimise food waste. Universities that allow students to choose smaller portions if requires are as follows: University of Pretoria, University of Limpopo, University Johannesburg, University of Free State, Durban University of Technology, Tshwane University of technology, University of South Africa and lastly University of Venda however there are contradictions from respondents who also selected fixed portion size from Tshwane University of technology, University of South Africa and University of Venda, and this respondents competed their studies just recently so the discrepancies can not be based on gap between year completed.

Students' perception toward food waste

13. Do you see food waste as a problem that needs to be combated?

35 responses

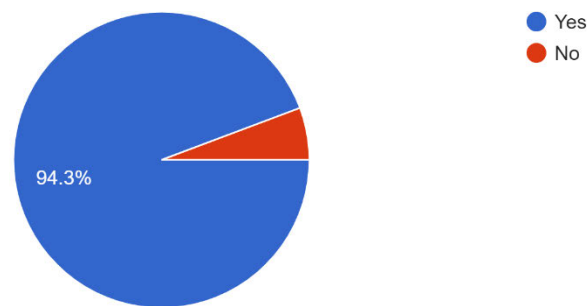


Figure 6.13:

Asked if they see food waste as a problem that needs to be addressed an overwhelming majority of 33 respondents said yes and only 2 said no, however 1 too many as the goal is the reduction and prevention of food waste in order to achieve a zero-food waste in the near future.

13. Do you see food waste as a problem that needs to be combated?

35 responses

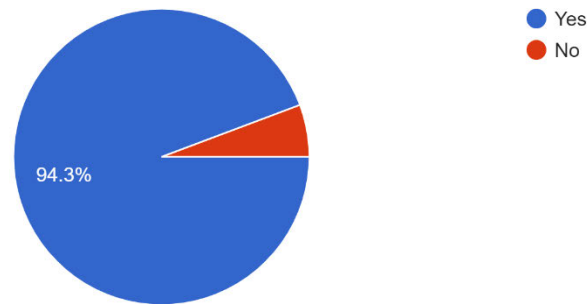


Figure 6.14:

Asked if they are personally concerned about the reduction of food waste, 94.3% of respondents are concerned while 5.7% are not. This mentality of not being concerned needs to be addressed through positive behavioural change.

Degree of student's knowledge and awareness of the impact of food waste on the human health and the environment

15. Are you aware of the negative impact of food waste on human health and the environment?

36 responses

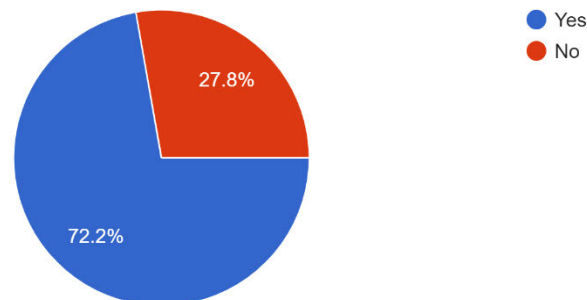


Figure 6.15

Awareness of the negative impact food waste has on human health and the environment, here 72.2% of the respondents are aware while 27.8% are not aware at all. Educating the youth about the negative impact of food waste is important based on this finding. Burlea-Schiopoiu et al. (2021) assert that young consumer's perception of food waste's impact on the environment can be improved in the same ways as the transmitted knowledge.

16. If yes, what made you aware of the impact of food waste on the environment? (Please tick whichever is applicable)

30 responses

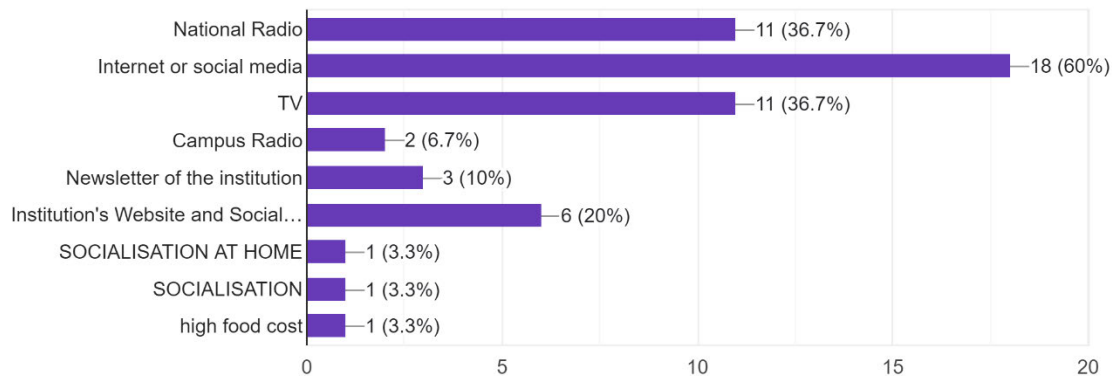


Figure 6.18: Impact of food waste on the environment

Those who are aware, majority got to know through internet or social media 60.% to be exact, followed by national radio and television at 36.7% each, interestingly awareness through institution's communications platforms is very low with 20% institution's website and social media platforms, 10% newsletter of the institution and 6.7% campus radio, respondents also added commend and sighted socialisation at home and socialising in general and one indicated the hight cost of food which is a bit misplaced response as the same responded with a no answer when asked if she was aware of the negative impact of food waste on human health and the environment. Based on this finding, on the above Figure 6.18 in alignment with Figure 6.5, conclusion can be made that, in comparison to all other universities, University of Johannesburg, Durban University of Technology and University of Limpopo, in practice, the most active in the actual awareness of prevention of the food waste. This means that awareness at institutions of higher learning is minimal and requires attention.

17. Are you aware of measures that your institution of higher learning undertook concerning food waste and the reduction of food waste on campus?

34 responses

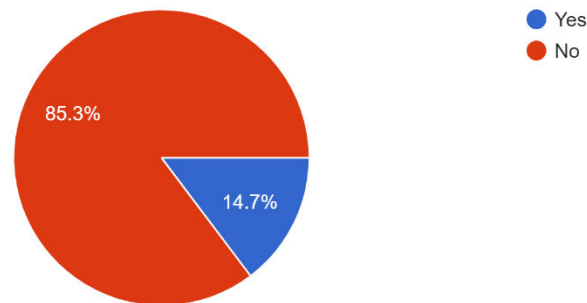


Figure 6.19:

Out of 34 respondents only 5 indicated that they were aware of measures that institution of higher learning undertook concerning food waste and the reduction of food waste on campus, 29 reported no knowledge of such measures, which is a worrying situation.

An important condition for responsible behaviour is a well informed and organised consumer. Given the fact that young people used to live with their parents and with tertiary independence they may not have consolidated certain food related routines and might fall into the behaviour of wasting food without anyone reprimanding them, hence through information, communication, and awareness they can be oriented towards responsible behaviour of food waste (Burlea-Schiopoiu et al., 2021).

18. Were there any messages placed in the rooms and cafeterias which encouraged students not to waste food?

33 responses

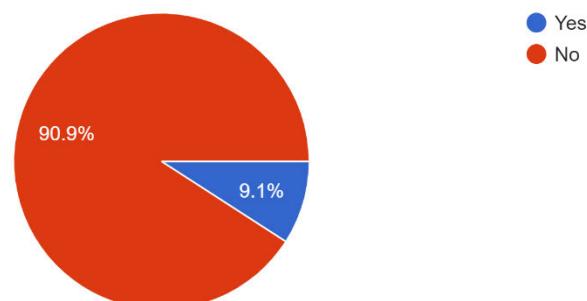


Figure 6.20: Food waste awareness

Asked if there were any messages placed in prominent areas within the institution's premises, an alarming 90.9% respondents said no and only 9.1% said yes. Aligning the above with Figure 6.5, students who said yes are from University of KwaZulu-Natal, University of Limpopo, Tshwane University of Technology and University of Venda. Interestingly some of the students who completed their qualifications in same institutions such as in 2008 have no knowledge of institution's food waste messages as compared to those who completed their studies in recently, which means these institutions started creating awareness in recent years.

Qualitative Analysis

In the open-ended question, respondents were asked to provide any other comment in their opinion on the topic. The figure below highlights some of the remarks.

19. Any other comment?

I don't remember seeing any measures taken in my campus. I think it's a good initiative because a lot of people would be helped if food is not wasted

Thanks for bringing this informative topic to light, from a young age, I was raised in such a way that I knew food should not be wasted as it is an essential need. This topic will help many people, especially now that the food prices are so high about the dangers of food wastage.

This is a good initiative, measures are indeed needed to eliminate food waste especially in this times, cost of living is evident in our communities. Thank you

During our time there was no lesson about waste food. It was something that made me feel painful when I see people wasting food. But I have noticed since COVID 19 most people had experienced a crisis on food because it was expensive. Nowadays people are no longer wasting food due to lots of shortages and higher prices of food. We are always reminded not to waste food where there is free food.

I advise my children to have small portion of food than wasting it.

Hope we get more of learning on this topic, because is important

focus on student is good, but majority of people who waste food are rich individual, if they do not like something they throw it

Let's not waste food especially in a time where the cost of living is so high. Food is more expensive nowadays.

Interesting topic

Marketing team of campuses need to circulate such communicate of making commuters and students aware of food preservation.

Let's teach our kids not to waste food.

Food waste is not practised and I encourage that people must be alerted of it at an early ages.

I have never stayed on campus I was studying through long distance learning

No comment

Figure 6.21: Comments from respondents

The highest number of comments viewed the topic on food waste management as important and as a good initiative. Remarks are in support of awareness raising on the food waste problem. Respondents indicated that based on their observation recently people have minimised wasting food due to the impact of as equally Covid-19 pandemic on the economy as prices of food has increased. Some comments bring the aspect of addressing the issue of food waste at a very young age as one of the factors that contributes to not wasting food as the practice is instilled from household.

Conclusions and recommendations

This study showed how avoidable food waste can be reduced simply by making students aware of the topic of food waste and put measures in place to encourage behavioural change.

According to the questionnaire results of this study, a set of recommendations was prepared, to serve as example for food waste reduction measures in institutions of higher learning in South Africa.

Practices are primarily influenced by culture so the Department of Sport, Arts and Culture (DSAC) should instil a culture of proper food waste management, prevention or reduction especially as the department is mandated to lead social cohesion and nation building. The Social Cohesion and Nation Building subprogramme of the department is the cornerstone of all social development programmes, since it provides support to moral regeneration programmes, facilitates community conversations on issues affecting society, supports target groups' programmes, to mention a few. (DSAC, 2021).

The food waste ethics among young people involves youth and young adult's acceptance of food waste by referring to their own principles and values. Rather than feeling guilty about wasting food, society should feel the sense of responsibility, and be aware that by making small adjustments in their daily food habits, they can contribute to improve the lives of people who do not have anything to eat (Pinto et al., 2018).

Through information, communication and awareness students can be oriented towards responsible behaviour of food waste. Pinto et al. (2018) determined that Kim and Freedman (2010) observed a 25% reduction of plate food waste after an education intervention on plate waste awareness in a university food service unit. This shows that the awareness campaigns are impactful and can produce a positive effect on the users' behaviour.

It is recommended that institutions of higher learning embark on educational campaign to raise awareness of food waste among students and monitor for a particular time frame to assess the effectiveness of the campaign. It is envisaged that the campaign will positively produce an effect

on students' behaviour and consciousness regarding food waste. However, in order to be effective food waste education campaigns to reduce food waste should be tailored to different types of young consumers, based on their knowledge, awareness and concern (Knezevic et al., 2019).

The approach could consist of displaying informative posters /canvases or digital screen with relevant food waste reduction messages in strategic areas of the canteen with messages reminding students not to accept food they knew they would not eat. Utilise campus radio station, newsletter, dialogues, website and social media platforms to instil a culture of zero food waste among students.

Cafeteria staff to also be educated on food waste and allow student to choose smaller portions if desired rather than fixed portion size.

Universities to also incorporate educational awareness campaigns across all other disciplines, if the university's Food Service Unit is managed by a service provider on contractual basis, there must be a clause in the contract or Service Level Agreement to instil behavioural change in relation to food waste in order to achieve food waste reduction.

The study revealed that some universities already allow students to choose smaller portions if desired which is applauded however there are discrepancies when students from same university dispute that. Further investigation is required as to what informs that, is due to different campuses it will mean that the same approach should be applied across all university campuses same applies to the roll out of food waste awareness campaigns.

In closing it is crucial to investigate collaborative ways to create innovative solutions to combat food waste between government, basic education, institutions of higher learning as well and the private sector and civil society. Key stakeholders to engage in policy dialogue for positive change.

Collective government and industry initiatives on Food Waste Prevention, Reduction and Awareness must be encouraged and institutions of higher learning must be at the forefront of this initiatives because many universities are concerned with sustainability issues, they should also be active in the prevention of food waste (Filho et al., 2021), moreover Some previous studies indicate that young consumers tend to waste more than older consumer. Knowledge is power and education is potent in the sustainable preservation of food resources and the shaping of society at large (Agbedahin & Agbedahin, 2019). To achieve zero food waste, all key stakeholders must join hands and address food waste challenge in the country.

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