

Review

Sustainable Consumption and Education for Sustainability in Higher Education

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Abstract: Sustainable consumption (SC) is the concept surrounding the use of products and services with minimal impact on environmental safeguarding resources for current and future generations. Since its implementation in 2015, SC is an expanding area of research as the increased occurrence of environmental impacts is observed globally. In this article, a literature review of sustainable consumption and education is presented as an in-depth review of relevant literature over the last 25 years. The review provides an understanding of the relationship, effect, and current concepts of sustainability education and consumption behavior. An analysis of the historical, geographical, and thematic characteristics of the relevant literature provided the scholarly context of the literature. An exploration into consumer behaviors on an individual and contextual level is presented, highlighting key factors for achieving sustainable consumption on the consumer level. A further review on the effect of education in general, and higher education on consumer behavior, is provided, noting the key findings for the support of sustainable education, as well as the anticipated barriers. In the conclusion, the effect of education on consumption is found to be positive and significant for pro-environmental consumption behaviors, and it is the main approach for implementing the ideals of sustainable consumption in the future.

Keywords: education for sustainable development (ESD); sustainable consumption (SC); higher education



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1. Introduction

Environmental challenges are ever-increasing because of population growth and the increased commodification of human activities in the modern and urbanized lifestyle. Alongside this, is the increased consumption of resources which endure the constant threat of exploitation with no major consequences on a social, economic, and environmental level. This results in undesired environmental impacts such as global pollution, increased carbon emissions, deforestation, food, and water insecurity, and so on [1]. Sustainable consumption (SC) becomes essential in achieving sustainable use of resources to mitigate adverse and undesired environmental impacts [1]. The utilization of commodities and services to answer to basic human needs and deliver a better quality of life, using minimal natural resources, minimal toxic materials, and emissions, throughout the life cycle of the commodities and services, and to not endanger the needs and the ability to provide those needs for future generations, is referred to as Sustainable Consumption and Production (SCP) [2,3]. The departure from SCP would cause significant environmental issues, resulting in major concerns globally, and calling for it to be addressed through education [4].

The Stockholm Conference on the Human Environment was the leading initiative to call for advancing sustainable development internationally in the early 1970s [5]. This was followed thereafter by the Belgrade Charter in 1976, and the Tbilisi Declaration in 1977 [6,7]. These occasions initiated the discussion on sustainability, and several elements pertaining to sustainability, such as consumption and production; however, the role of education in

these settings was still to be developed further. Most notably, the Brundtland Report and the United Nations Conference on Environment and Development aided in the additional development of sustainable development notions and emphasized the importance of advancing sustainability globally through education [8]. The report popularized the idea of sustainability and its connection to education. This is followed by several global initiatives in an effort to reduce environmental impacts globally, with aspects of its implementation being achieved through education. The Rio de Janeiro United Nations Conference on Environment and Development in 1992 recognized SCP as a key aspect that is associated with addressing sustainable development challenges [8,9]. The emphasis on aspects such as education and public awareness in aiding in the application of sustainable development successfully was further recognized in Agenda 21 [8]. The Kyoto Protocol treaty in 1997 was intended for the reduction of greenhouse gas emissions globally among developing countries [8]. The Millennium Development Goals launched by the United Nations in 2000 were additionally intended to focus on the reduction of poverty and on educational opportunity improvement [8]. Most recently, a significant role in achieving sustainable development was given to SCP in the Agenda for Sustainable Development in 2030 [1]. SCP is currently a specific Sustainable Development Goal (SDG), encompassing several of the SDGs' issues adopted across 17 agenda goals, which concentrate on achieving the SDGs through educational programs such as ESD [1].

Higher education institutions (HEIs) are increasingly aware of the fact that they are a crucial facet of society and need to contribute to sustainability and sustainable development in a meaningful way [10]. Through the education of future generations and the advancement of research and collective knowledge, higher education institutions are leading the transformation of our current societies into what they will become [11]. HEIs have the potential through education and practice to transform the collective global youth changing the world. Education in HEIs aims for the enlightenment of young minds, finding solutions to challenges through research, and supporting and maintaining a knowledgeable public. In practice, HEIs can promote a sustainable society through their education, culture, and campus, as well as provide capable professionals for business, communities, and the economy [12,13]. Education is crucial to promote and enhance the ability of societies to engage and lead in SCP and inherently sustainable development.

Questioning the association of consumption, and education towards achieving sustainable development, the objective of this paper is to conduct a review providing insight into the current notions of sustainable consumption and education. This is conducted initially by providing an analysis of the body of literature itself, followed by the categorization and discussion of the salient concepts for sustainability, for both consumption and education within the relevant articles.

2. Review Methodology

This paper explores the understanding and impact of Education and SC in educational settings by utilizing a literature review. The literature review allows for a methodological approach of uncovering and categorizing relevant articles concerned with Education and Consumption that have been published in scientific journals from previous bodies of research. The literature review involves an initial collection stage where through searching for relevant articles and topics of interest, a collection of articles from scientific peer-reviewed journals is established. Furthermore, the collected articles go through a filtering and selection process wherein the remaining relevant articles are further analyzed and included within the review.

2.1. Data Sources

The literature search is concentrated on previously published research that is involved to any extent in both the subjects of education and consumption. This study included searching three widely used databases, which are Google Scholar, Scopus, and Web of Science, for the relevant articles surrounding education and SC research. Relevance of

the articles is based upon several selection steps which include identification, screening, eligibility, and finally, inclusion. The selected databases for the literature search are highly utilized, and they provided a considerable number of peer-reviewed journals with high impact factors for the subjects of concern in this study; however, we acknowledge that not all publications are included in these databases.

The main keywords that were used to search all the titles, abstracts, and keywords of the articles in the databases are: “consumption” AND “education”. The selection of the search terms “consumption” AND “education” allows for the search of both singular and plural forms, the expanded forms of the terms, as well as the combinations of the terms to include all possible combinations and forms of the selected search keywords such as “sustainable consumption and education” and “Educational methods for Sustainable Consumption”.

2.1.1. Selection of Research Materials

The initial step in the literature search, by using the stated keywords, identified a total of 339 articles in English written within peer-reviewed journals.

Screening of the articles was conducted where irrelevant articles were omitted from further analysis. The screening process omitted duplicate and rarely cited articles which left 90 articles to be assessed for eligibility. Moreover, the eligibility of the articles is based upon whether the papers are sustainability consumption and ESD focused, the data within the articles is related to or within educational institutions, and finally, that the full text of the article is available to read. After applying the eligibility selection requirements, 76 articles remained, and were identified for the in-depth review process.

The final step in determining which articles were included was conducted after the in-depth review, which yielded a total of 73 peer-reviewed journal articles to be included in this study. A summary of the process of selecting the articles is illustrated in Figure 1.

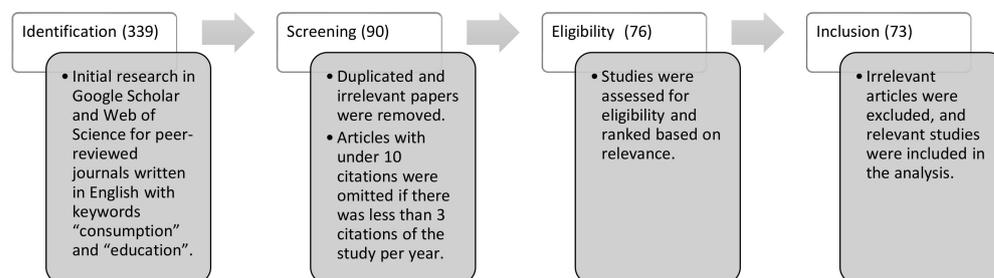


Figure 1. Literature review analysis process.

2.1.2. Strategy for Review of Included Studies

The exploration of the articles reviewed by topic allowed for the development of common ideas across the articles. The full-text analysis of the articles reviewed granted the creation of a matrix to study article characteristics. The review is initialized with general article information such as the journal name, year of study, and the origin of study, and encompasses nuanced details such as the data collection methods, subjects and consumers considered within the studies, the education institute and level, and the objectives and findings.

3. Literature Analysis

The literature review spans a total of 28 years and includes all the relevant papers covering SC and higher education within that time. The literature review is initiated with the first paper published in 1994, and the highest number of publications per year is found in 2021, with a total of 54 relevant papers in that year out of the total 339.

The greatest portion of papers published on this topic is conducted after 2010 with over 90% of the relevant papers being collected from that period (Figure 2).

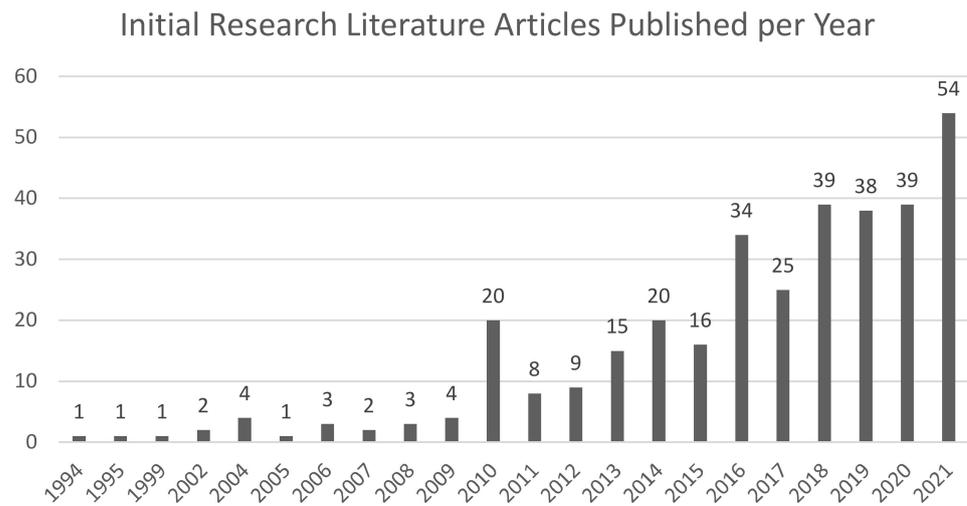


Figure 2. Number of publications per year out of a total of 339 for the initial research for peer-reviewed journals with keywords “consumption” and “education”.

Geographically, the literature review incorporates the relevant papers from a total of 30 different countries across the world which are identified from 85 papers of the total 339. The greatest percentage of papers within the literature in terms of geography are studies conducted in the United States of America, with a total of 14%; this is followed by studies conducted in China with a total of 11%, and Spain at 8%.

However, examining the percentage of papers within the literature across continents, the greatest percentage is observed in Europe, with 48% of the relevant papers published there. The second greatest is observed in Asia with 26% of the papers, followed by North America (14%), South America (9%), and finally Australia (2%).

Notably, within the developing nations of the world, fewer studies are conducted; however, due to the number of nations within these regions, they amount to a high percentage of studies conducted (Figure 3).

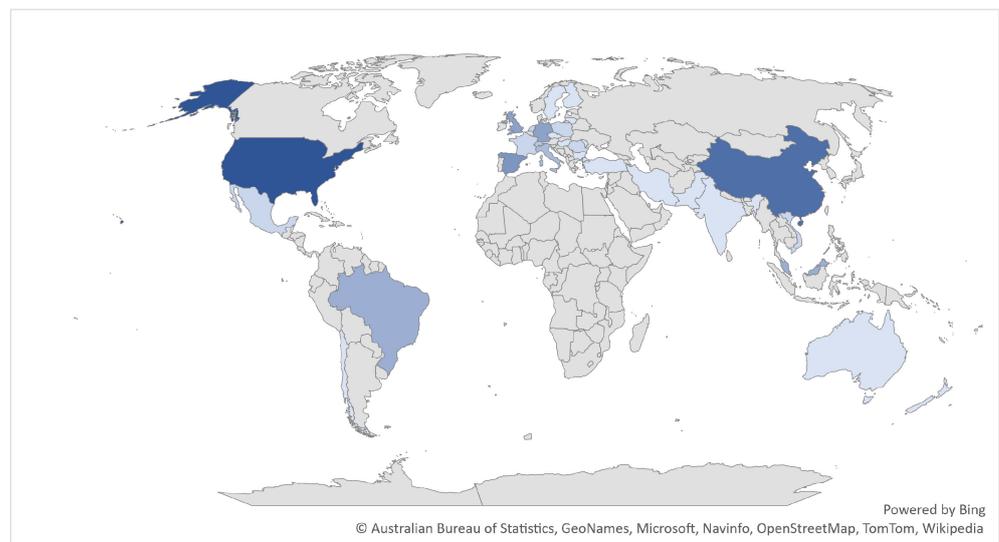


Figure 3. Geographical focus of the papers from 85 papers of the total 339. Darker colored countries identified the density of papers published within the corresponding country.

The publications surrounding this topic, over the period that the literature review was conducted, covers 1994 until 2021. Considering the journals in the literature review, Figure 4 illustrates the top journals with a total of 114 articles. The papers mainly appeared in *Sustainability*, with 48 of the papers, followed by the *Journal of Cleaner Production*, with 32 of the papers, and the *International Journal of Consumer Studies* and *International Journal of Sustainability in Higher Education*, both with 8 papers each. The journals with the number of papers that accounted for more than 1% of the total papers conducted in the literature review are represented in Figure 4. Roughly a quarter of the published articles identified within this literature review are presented within just two journals, *Sustainability* and the *Journal of Cleaner Production*.

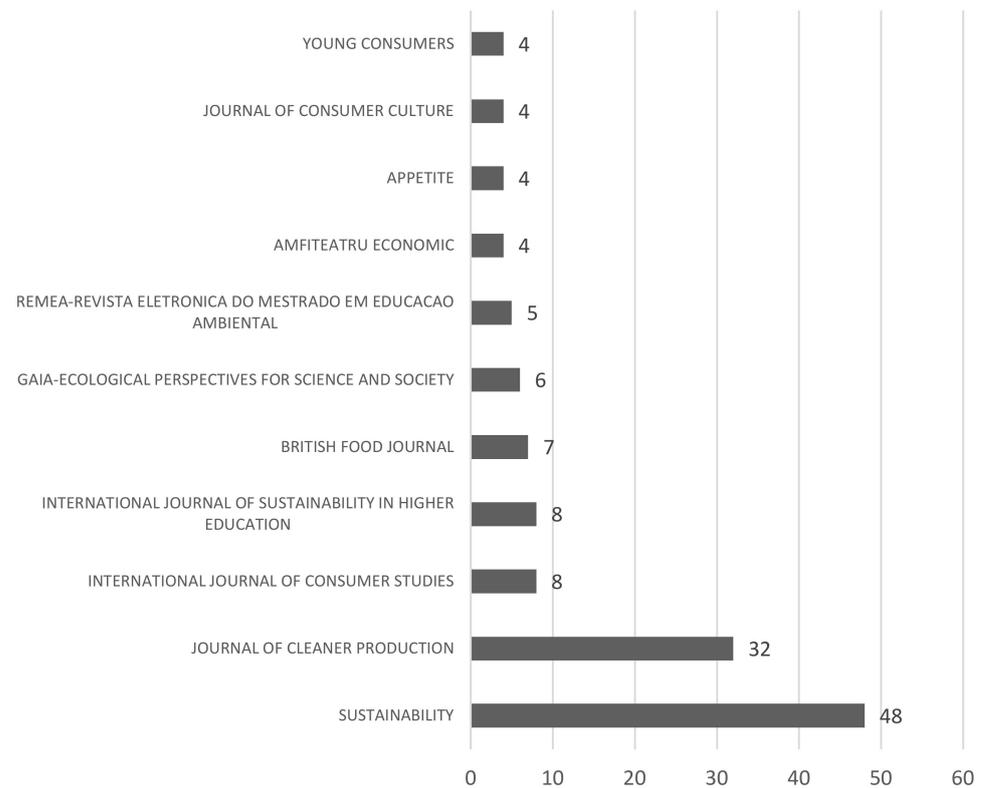


Figure 4. Number of articles published in journals from the literature review that have more than 1% of the total papers conducted in the literature review.

Examining the subjects that have been considered in these studies, within the literature review, the greatest percentage of the subjects studied are general consumers. Consumers amount to 39% of the subject studied, followed by Students (27%), Residents (14%), and Teachers (8%). Field experts, companies, and stakeholders involved in consumption are considered within the papers as subjects; however, in a less significant amount with a total percentage of 7% across all relevant papers considered (Figure 5). Students shape a significant portion of the subjects considered within these articles, and thus, the effect of education on SC can be further examined.

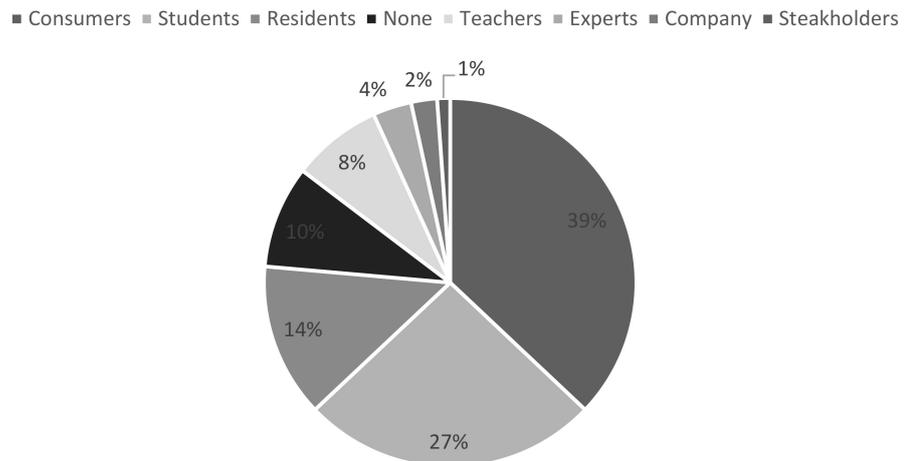


Figure 5. Target subjects studied in different articles from the literature review.

Evaluating the different types of consumption studied within the papers in the literature, the greatest percentage of the studies are focused on general consumption, with about half of the published papers considering this as the main consumption type evaluated. General consumption in this context refers to papers that examine several aspects of consumption such as household, food, transportation, and so on, or papers which do not specify the type of consumption studied. Papers on general consumption account for 48% of the total, followed by food consumption which accounts for 26%, and energy consumption accounting for 5% (Figure 6).

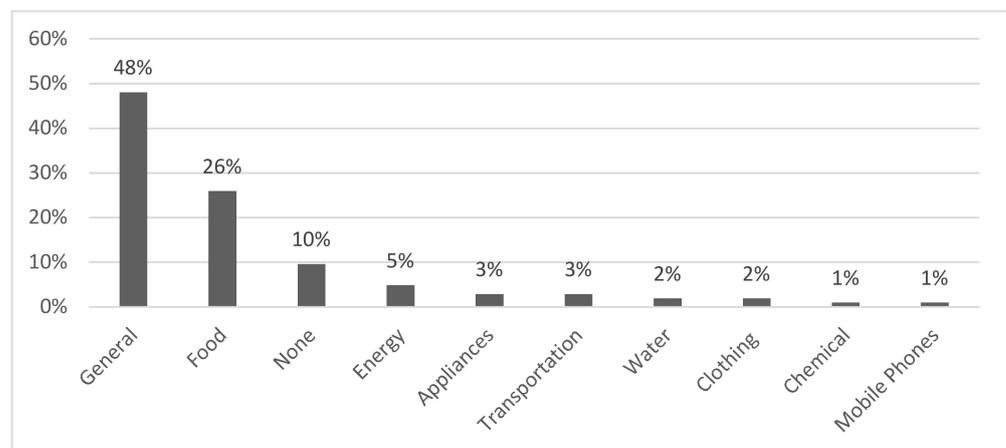


Figure 6. Consumption types studied in the different articles from the literature review.

Although significant, general consumption would benefit from further examination under several subcategories, as certain consumption types such as food, when combined with other types of consumption, might reduce the capacity for detailed assessment of consumer behaviors. Several papers within the literature review have considered detailed consumption types, although not in a significant amount compared with general, food, and energy consumption. Notable consumption types considered in the literature examined the consumption of appliances, transportation, water, clothing, chemicals, and mobile phones. The total percentage of these consumption types accounts for 12% of the total papers within the literature review (Figure 6).

Papers that have been included in the literature review, but have not examined a specific type of consumption, account for 10% of the total papers. These papers examined pro-environmental behaviors in general, and the link between education and certain envi-

ronmental actions. These findings suggest consumer behaviors and attitudes based upon general environmental behavior; however, this was not realized by examining a specific type of consumption (Figure 6).

Assessing the location of the studies within the papers in the literature, the greatest percentage of studies is conducted outside of educational settings. Roughly 67% of the studies considered public settings for their research. These public setting subjects, such as consumers, residents, and so on, are where the data is collected from; however, within educational settings, higher education institutes amount to a larger portion (23%) in contrast to primary/secondary education settings (10%) (Figure 7). Focusing upon educational settings for understanding SC, higher education articles have the greatest volume to examine.

■ General Public ■ Higher Education ■ Primary/ Secondary Education

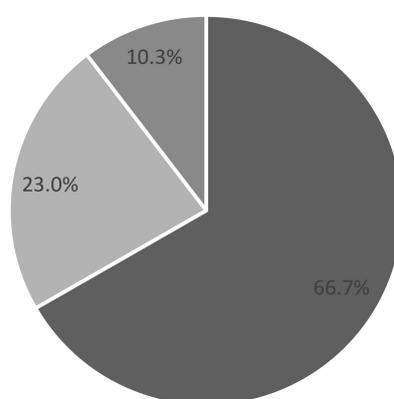


Figure 7. Domain of study in the different articles from the literature review.

4. Sustainable Consumption

SPC was first recognized at the UN Conference on Environment and Development, which took place in 1992, in Rio de Janeiro, in [14]. Furthermore, in 1994, the Oslo Symposium on Sustainable Consumption, which analyzed the working definition of SCP, was established [14]. SPC is defined as the use of services and products, which meet basic needs and increase the quality of life, while minimizing natural resource use and adverse environmental effects over the life of the service or product, to allow for the needs of future generations to not be compromised [1,14]. As consumers have an immediate retaliation with consumption, more so than production, the literature is reviewed to explore the relationship of consumers to SC.

4.1. Immediate Consumption

SC is the use of a product or service which maintains basic needs and increases the quality of life of the consumer with minimal use of natural resources and adverse environmental effects over the life cycle of the service or product. This is to make sure that current consumers can meet their needs without compromising future generations' abilities to meet their consumption needs, in line with sustainability principles [1]. Understanding sustainable consumption or green consumption in the literature is to recognize what motivates consumers' attitudes and behaviors towards consumption [15–18].

One's action of consumption and consumer behavior based upon the literature can depend on a range of variables. Typically examined variables contain characteristics such as lifestyle [19,20], the age of the consumer, their gender, the family size, their level of education, and ecological knowledge [21–23], as well as their social and economic status [18,20,24–30]. All social, economic, demographic factors, and environmental knowledge are identified to have an effect on a consumer's consumption behavior [28,29,31–33].

A significant variable and indicator of a consumer's behavior towards pro-environmental consumption is the possession or availability of wealth. Numerous studies represent how in households that are considered to have high incomes, have higher instances of consumption, and a negative carbon and material footprint is observed [34–38]. For example, examining household energy use in Qatar showed that there is an elevated consumption of energy due to the fact that Qatar households have high incomes and cheap energy availability [39]. This further indicates that the notion of consumption is significantly linked to the costs of the service or product being consumed. A high cost for a service or product will yield less consumption; therefore, how much material wealth the consumer has, or what the product or service costs, will highly affect the consumption rate [39]. Additionally, separate studies have shown that frugality and green behavior have a positive and significant effect when investigating several pro-environmental purchasing and consumption behaviors [18,40]. A counterargument to the positive effect of the decrease in wealth and pro-environmental consumption behaviors is that having a high income is important in transforming positive attitudes into sustainable behaviors as increasing awareness, skills, and meanings are found to be significantly facilitated by income [37,40,41], although some studies state that this is not the case [41–43].

4.2. Contextual Consumption

A significant aspect of consumers' consumption is in relation to their immediate context. Several factors such as regulations, labeling, and the use of technology can inherently affect the sustainability of a consumer's consumption without their awareness or control [43–45]. The contextual disruption to normality, such as in global pandemics, is an example of how consumer behaviors are not always under the control of the consumer, but can be circumstantial [46].

The literature argues for a need for provided knowledge that can influence consumers' behavior and allow them to act sustainably in their purchases and acquired services [43–45]. It is argued that any consumer policies or governance that is dependent on the freedom of the consumers to act in a pro-environmental consuming manner are bound to fail [47,48]. This is because sustainable consumption in this instance becomes a matter of logical determination, in terms of the decisions that a consumer can make about the level of sustainability of a product, and not as a clear choice based upon actual sustainability information provided by the product [49,50]. It is likewise suggested that providing consumers with the correct knowledge, which will allow consumers to make their own decisions, can aid sustainable consumption [44,47,50]. The focus of sustainable consumption on the private sphere instead of the political system is criticized and is considered as an undemocratic process that creates moral pressure on the consumer to consume sustainably [49]. A further step in the argument states that it is the responsibility of politicians, through policy and governance, to ensure that consumers have the necessary information to contribute to sustainable consumption on an individual level [44,48,51].

Although the contrary is also argued, in that individuals play a bigger role than governance and policy in terms of consumption, or that they can contribute at an equal level [45,52,53]. In instances with poor regulation over the control of the energy supply within urban centers, it is apparent that consumer behavior is more on the side of excessive usage [39,54,55]. As an example, in Qatar, the lack of a penalty for excessive energy use and the free nature of household electricity results in excessive energy use at the household level [39]. Likewise, the increase in household energy use for appliances has been observed to result in an increase in the intensity of household energy consumption which introduces the aspect of a positive feedback loop in terms of overconsuming, which is a result of the lack of governance or policy on the consumption level [39,56]. Energy-saving policies would serve to reduce household energy consumption and draw a path towards sustainable consumption behavior.

Notably, researchers come to an agreement, that in order to develop such regulatory measures, there is a need for an adequate stakeholder engagement, ESD, and the participation of the households to result in sustainable consumption overall [57,58].

Food consumption provides much insight into consumer behaviors, and is attracting increasing consideration because of its environmental, social, and economic effects [59]. Although food waste and food-related behaviors are observed measures in determining consumption behaviors, food in general is also dependent upon contextual factors which dictate consumption, such as regional differences, food availability, and distribution [59,60]. In the literature, labeling has been found to have an effect on consumption and consumer behaviors, depending on several food properties which can encourage sustainable consumption or pose a barrier to it [61–65]. Examining food labeling such as organic or fair trade, consumer choice has been found to focus mostly on appearance, taste, price, brand, convenience, and origin. Furthermore, social, and environmental certifications are next, followed lastly by characteristics of recyclable packaging and food miles [61–63]. As public awareness and education are recognized as the main factors impacting consumption and purchasing behavior, an informative label could serve to benefit sustainable consumption [64,66,67]. On the other hand, consumer hesitancy has been found to be in relation to the limited availability of product information as well as the lack of confidence of producers. Policy and governance measures are noted to need strengthening to promote sustainable consumption from a purchase aspect, and that they will have more success when the involvement of the consumer is made available [61,68,69].

Technology interventions are elements that can inform or actively control an individual's consumption patterns based on a designated outcome, and in the case of sustainable consumption it would be to promote sustainable consumption. Technologies that are meant for sustainability can highly benefit environmental issues such as in the reduction of greenhouse gas emissions, which would have a direct effect on climate change, air quality, pollution, and so on. [70]. Throughout numerous studies, although the awareness of sustainable benefits of sustainable consumption, such as in the reduction of energy use, is apparent to individuals and households, little or no effort is generally taken at the individual or household level to mitigate purchasing and consuming behaviors [70]. It is here where technologies can benefit as an active agent for sustainable consumption that is passively administered by the consumer themselves [70,71]. Examining household energy use, energy-saving technologies, and feedback displays meant to reduce energy consumption, have been found to be effective in most households [71].

4.3. Consumption and Behavior

To explore the purchase intentions of consumers, often the most widely used theory is the Theory of Planned Behavior (TPB) [72–74]. TPB states in basic terms that a consumer is more likely to behave in such a manner if the behavior being performed is beneficial to that consumer [42,72,73]. This explains how environmental attitude is frequently shown to positively affect environmental behavior and actions [42,75]. Research conducted on an environmentally friendly “green event” has found positive environmental behaviors associated with the attendees of this event, established through a survey distribution [76]. The majority of attendees when surveyed about pro-environmental actions such as regular recycling, saving energy, reducing waste, and sustainable consumption practices stated their commitment to these actions [76]. As the attendees of such events usually have a positive environmental attitude, as expected by TPB, positive environmental behaviors are observed [76]. Furthermore, extending the TPB is suggested to allow for the integration of both the sustainability aspects and the concepts of sustainability knowledge and sustainability values in the current TPB model [77].

For sustainable consumption similar to sustainable actions, a positive feedback effect is observed. When a consumer engages in performing sustainable consumption, or any sustainable behavior, this behavior can carry over to other sustainable actions, regardless of the difficulty of its application [78]. This effect, regarded as a behavioral spillover in

the literature, is documented when examining consumers' sustainable behaviors [78]. It was observed that consumers who made their first decision, when presented with two options related to either transportation or food sequentially, based on carbon emission reduction, were further likely to make their second decision based on an option that aligns with sustainable behavior [78]. This is to illustrate the behavioral aspect of consumers, who engage in sustainable consumption, that they may engage in further sustainable actions or consumption as a positive feedback aspect of behavior.

5. Education for Sustainable Consumption

Education for Sustainable Consumption (ESC) was included in the educational methods which were promoted in 2000 as a part of the Millennium Development Goals, implemented by the UN General Assembly [79]. ESC aims at delivering knowledge, values, and skills to make individuals and societies change agents for more sustainable consumption behaviors [79]. ESC attempts to provide the proper knowledge on how consumption impacts the environment and society, while also providing possible solutions and alternatives [79]. As this is very dependent on the knowledge, values, and skills of the consumers, and is evaluated by their consumption behaviors, an exploration into consumer behaviors from the relevant literature is considered.

5.1. Education for Sustainable Consumption and Behavior

Consumer behaviors directly affect the environment, which can occur through consumer purchases, services, or generated waste [80–83]. The ability to establish sustainable societies and promote sustainable consumption ought to be accomplished through pro-environmental education [84–87]. As pro-environmental education is suggested as the key tool to influence sustainable consumption, likewise, the impact of environmental knowledge on pro-environmental behavior is examined through the literature [83,88].

The literature suggests that appropriate pro-environmental education will directly impact students' pro-environmental behavior in several ways [89]. Research suggests that the intensity of environmental education is strongly correlated to the students' environmental knowledge [89]. For example, researchers suggest that in settings where pro-environmental education is encouraged as an educational method, a pro-environmental behavior expected would be a reduction of harmful impacts on the environment [89,90]. For example, researchers suggest that in settings where pro-environmental education is encouraged as an educational method, a pro-environmental behavior expected would be a reduction of harmful impacts on the environment [89,90]. Likewise, action-related environmental knowledge was found to positively influence the ecological worldview [65,83]. Additionally, this would result in an increase in the awareness of the individuals' behavioral impacts on the environment [83,91]. Researchers found that pro-environmental behaviors, notably green food purchases and environmental action, were positively related to action-related environmental knowledge [92,93]; however, it is noted that factual knowledge on its own would not represent a positive relationship to the same pro-environmental behaviors [92,93].

The increase in pro-environmental knowledge can result in an increase in the student's awareness of their individual environmental impacts, but not translate to the development of pro-environmental behaviors [31,94]. The literature highlights instances where pro-environmental knowledge about sustainable living can yield no pro-environmental behaviors due to issues such as increased associated costs and conflicting expectations of a sustainable lifestyle [95]. This can additionally lead to a "self-inflicted sustainable consumption paradox" where people are aware and believe in pro-environmental action, however, they become conflicted in their actions as the option to engage in sustainable lifestyles poses a challenge to them [96]. This is evident in findings of household energy consumption wherein a household would remain on unsustainable energy sources even when provided with knowledge of more sustainable energy options and the environmental impact of unsustainable energy sources [55,97].

Furthermore, the possession of pro-environmental ideals with a lack of knowledge can result in misinformed activism, which would have a negative effect on the environment and consumption behaviors [83]. For example, high energy consumption in Qatar is reported with a lack of knowledge surrounding the environmental impacts of this consumption [39]. The correlation between pro-environmental knowledge and pro-environmental attitude highlights that when students' knowledge increases, an increase in attitude is also expected [98]. As discussed in the literature, pro-environmental attitudes do not always materialize into pro-environmental behaviors, as certain issues can impose barriers to developing these behaviors; however, this indicates that to increase a student's sustainable, responsible consumption, the initial step required is to incorporate a pro-environmental education [89,98,99].

The positive influence of environmental education on pro-environmental students, as illustrated in previous research, identifies that higher education levels, in contrast to lower educational levels, encourage stronger intentions to make green purchases, environmental advertising, and an overall improvement in an individual's environmental concern and behavior surrounding their impact on the environment [33,89,93,100,101]. Additionally, a positive relationship between pro-environmental behaviors and the education level was found in a conducted survey of students; likewise, within the same study, a greater pro-environmental behavior was found in students in an environmentally oriented subsection [22,33]. Furthermore, the study suggests that this may be because the students are involved in an environmentally oriented department, and this extended exposure can have a greater effect on the student's pro-environmental behavior [22,33]. It is the consensus of various researchers that an individual's environmental knowledge, attitude, and behavior is positively influenced by their environmental education and education in general, and that sustainability studies in higher education illustrates that advanced students, in contrast to beginner students, show a greater environmental concern [33,76,102,103].

5.2. Education for Sustainable Consumption and Higher Education Institutes

Higher education contributes a significant role to sustainable development, and specifically sustainable consumption, as it has the ability to provide the necessary pro-environmental education required for promoting sustainable consumption [87,104–106]. Sustainable consumption education is focused on the development of key knowledge and competencies to allow for students to be involved in sustainable consumption choices through the acquisition of factual and procedural knowledge [107–112]. The integration of the curriculum in higher education organizations to facilitate learning for sustainable consumption is the initial and most recognizable method for delivering this education. This can occur within the classrooms, as learning through source material such as textbooks, or through teaching staff [87]. It is noted that students, in addition to learning in the classroom, spend a large amount of their time outside of formal education, and both can be utilized for the deployment of experience-based learning [87,108,113]. Suggested models of experiential learning call for a need for deeper learning, with a concentration on experiences and activities, to allow for the acquisition of knowledge through the student's own experiences, and not just delivered educational content [87,114–117]. The likelihood of including the deployment of extra-curricular activities within education is emphasized, as it holds the potential to not only deliver the expected results, but also to result in incidental learning for the learners [87,118,119]; to allow for the absorption of pro-environmental behaviors in aspects such as rules, routines, and practices within the educational organization. Additionally, the culture of an organization plays a central part in providing the potential for incidental learning for the students within educational culture [87,120,121]. Examples of such experience-based learning are numerous and are cited as successful measures within the literature; these experience-based learning methods can exist in initiatives with higher education organizations, such as student purchasing habits, waste reduction, and the minimization of resource use.

Analyzing green food consumption intentions and behaviors among consumers in China, the research found that education affects the intention for green food consumption. The findings highlighted that consumers with higher education, after normalizing for internal influencing factors, are more likely to intend and actually purchase green food [43,68]. Furthermore, public education alone was not found to have a significant influence on the consumption of green foods in the general public, and governmental effort is critical to promote green food consumption and labeling [48,68,122].

The Green Office initiative for waste minimization in the Universiti Teknologi, Malaysia, was designed to minimize waste and serve as a means of behavioral change, with a focus on such as sustainable meetings, saving paper, and practicing recycling [123]. This initiative for waste minimization resulted in a reduction of campus paper by an average of 43% in the three years it was studied, thus significantly reducing the associated waste, costs, and carbon emissions of the use of paper on campus [123]. Notably, the difficulty associated with the establishment of initiatives such as the Green Office on campuses, is noted to be due to the implementation of the procedures and a lack of support from the departments. Additionally, research suggests that this can be mitigated through university good governance practices and policies to encourage the use of sustainable resource planning on campus [123–125]. The strategy in the University of Sonora to eliminate any inappropriate behaviors that generate wastewater on campus through the design, operation, and maintenance of its Sustainability Management System (SMS), illustrated the benefit of maintaining very low levels of waste. This study analyzed water consumption at the Industrial Engineering Department as an environmental aspect of the Sustainability Management System (SMS), which monitors the efficiency in water use in green areas, restrooms, drinking fountains, labs, and other facilities several times throughout the day to identify and amend water wastage on campus. A low level of wasted water has been reported with the implementation of this system, of approximately 38 m³ [126].

6. Conclusions

Consumption is a major characteristic of the modern and urbanized life, which comprise most of world experiences. Consumption has become almost inevitable in every interaction, from acquiring the necessities for life, all the way to entertainment and enjoyment. Markets and profit motives drive the desire for consumption ever higher, whereas calls for sustainable development and protecting future generations attempt to limit, control, and decrease the negative effects of consumption on the environment, economy, and societies. Understating human consumption is a challenging concept as many aspects can affect a consumer's consumption, some of which are in their direct control, whereas others are not.

In general, from the analysis conducted, the academic understanding of consumption can be considered under two central categories of consumption: immediate consumption, and contextual consumption. Consumers can directly influence their immediate consumption based upon certain factors such as where or even what they choose to purchase based upon criteria they deem important, such as the cost of the product or its effect on the environment, and so on. Contextual consumption on the other hand, to a certain degree, dictates how and what a consumer might consume. This can be through policy measures that ban the imports/purchasing of a specific product, or even as taxation, which forces consumers to reconsider their spending and consumption behaviors.

For all consumption, across the literature, in general significant agreement, the positive effect of education towards pro-environmental consumption behaviors is evident. The academic stance of education and consumption is that a positive change in consumption behaviors can be made through the purposeful implementation of educational initiatives such as ESD, ESC and production. Education is identified as the greatest factor contributing to consumer's attitudes towards pro-environmental consumption. Likewise, higher education institutions are acknowledged as the most effective provider for such initiatives,

as the potential for implementation across the curriculum and campus is favorable in that period of a student's education.

Considering the future of sustainable consumption and education, several concepts are to be considered. It is evident throughout the entire body of literature that a sustainability-oriented education does have a positive effect on sustainable consumption in general; however, the means and settings as to where this education is presented could be numerous, and this would benefit from a consideration of what means and settings would serve a certain type of consumption best. For example, examining the effect of the introduction of recycling bins on campus upon students' recycling behaviors, in contrast to providing lectures on the benefits of recycling. In addition, future considerations concerning consumption behaviors of consumers would benefit from being understood under the context of consumption to provide a better understanding of the intentions and limitations of the consumer behaviors. Both immediate and contextual consumption provide insight into consumption behavior; however, some contextual consumption factors such as consumer policies can facilitate or limit some sustainable consumption behaviors. Furthermore, as the significance of education towards sustainable consumption on a personal level is apparent, future consideration into the effects of personal consumption behavioral changes that positively affect societies can be considered. Pro-environmental consumption behaviors can be achieved on a personal level as a result of education, and can likewise be expressed through the influence of individuals on society, whether at a household or national level.

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References

1. UN. *United Nations Transforming Our World: The 2030 Agenda for Sustainable Development*; Department of Economic and Social Affairs: New York, NY, USA, 2015.
2. OECD Development Co-Operation Report 1997: Efforts and Policies of the Members of the Development Assistance Committee. Available online: https://read.oecd-ilibrary.org/development/development-co-operation-report-1997_dcr-1997-en#page1 (accessed on 29 March 2022).
3. UNEP—UN Environment Programme. UNEP 2012 Annual Report. Available online: <https://www.unep.org/resources/annual-report/unep-2012-annual-report> (accessed on 29 March 2022).
4. UNEP—UN Environment Programme. UNEP Programme Performance Report 2016. Available online: <https://www.unep.org/resources/report/unep-programme-performance-report-2016> (accessed on 29 March 2022).
5. United Nations. United Nations Conference on the Human Environment, Stockholm 1972. Available online: <https://www.un.org/en/conferences/environment/stockholm1972> (accessed on 31 March 2022).
6. The Belgrade Charter. Available online: <https://www.gdrc.org/uem/ee/belgrade.html> (accessed on 29 March 2022).
7. Tbilisi Declaration. 1977. Available online: <https://www.gdrc.org/uem/ee/tbilisi.html> (accessed on 29 March 2022).
8. United Nations. United Nations Conference on Environment & Development. Available online: <https://www.un.org/en/conferences/environment/rio1992> (accessed on 31 March 2022).
9. UNEP—UN Environment Programme. UNEP 2010 Annual Report. Available online: <https://www.unep.org/resources/annual-report/unep-2010-annual-report> (accessed on 29 March 2022).
10. Tilbury, D. *Education for Sustainable Development: An Expert Review of Processes and Learning*; United Nations: Paris, France, 2011.
11. Lozano, R. Incorporation and Institutionalization of SD into Universities: Breaking through Barriers to Change. *J. Clean Prod.* **2006**, *14*, 787–796. [CrossRef]
12. Galang, A.P. Environmental Education for Sustainability in Higher Education Institutions in the Philippines. *Int. J. Sustain. High. Educ.* **2010**, *11*, 173–183. [CrossRef]
13. Lotz-Sisitka, H. The “Event” of Modern Sustainable Development and Universities in Africa. *Sustain. Dev.* **2011**, *2*, 1.
14. UNEP. *Abc of Scp Clarifying Concepts on Sustainable Consumption and Production*; United Nations: Paris, France, 2010.

15. Diamantopoulos, A.; Schlegelmilch, B.B.; Sinkovics, R.R.; Bohlen, G.M. Can Socio-Demographics Still Play a Role in Profiling Green Consumers? A Review of the Evidence and an Empirical Investigation. *J. Bus. Res.* **2003**, *56*, 465–480.
16. Peattie, K. Golden Goose or Wild Goose? *The Hunt for the Green Consumer. Bus. Strategy Env.* **2001**, *10*, 187–199. [[CrossRef](#)]
17. Moisaner, J. Motivational Complexity of Green Consumerism. *Int. J. Consum. Stud.* **2007**, *31*, 404–409. [[CrossRef](#)]
18. Naderi, I.; van Steenburg, E. Me First, Then the Environment: Young Millennials as Green Consumers. *Young Consum.* **2018**, *19*, 280–295. [[CrossRef](#)]
19. Jang, Y.J.; Kim, W.G.; Bonn, M.A. Generation Y Consumers' Selection Attributes and Behavioral Intentions Concerning Green Restaurants. *Int. J. Hosp. Manag.* **2011**, *30*, 803–811. [[CrossRef](#)]
20. Śmiglak-Krajewska, M.; Wojciechowska-Solis, J.; Viti, D. Consumers' Purchasing Intentions on the Legume Market as Evidence of Sustainable Behaviour. *Agriculture* **2020**, *10*, 424. [[CrossRef](#)]
21. Kanchanapibul, M.; Lacka, E.; Wang, X.; Chan, H.K. An Empirical Investigation of Green Purchase Behaviour among the Young Generation. *J. Clean Prod.* **2014**, *66*, 528–536. [[CrossRef](#)]
22. Cincera, J.; Krajhanzl, J. Eco-Schools: What Factors Influence Pupils' Action Competence for pro-Environmental Behaviour? *J. Clean. Prod.* **2013**, *61*, 117–121. [[CrossRef](#)]
23. Elliott, R. The Taste for Green: The Possibilities and Dynamics of Status Differentiation through "Green" Consumption. *Poetics* **2013**, *41*, 294–322. [[CrossRef](#)]
24. Muralidharan, S.; Xue, F. Personal Networks as a Precursor to a Green Future: A Study of "Green" Consumer Socialization among Young Millennials from India and China. *Young Consum.* **2016**, *17*, 226–242. [[CrossRef](#)]
25. Morrison, P.S.; Beer, B. *Consumption and Environmental Awareness: Demographics of the European Experience*; Springer: Berlin/Heidelberg, Germany, 2017; pp. 81–102.
26. Figueroa-García, E.C.; García-Machado, J.J.; Yábar, D.C.P.B. Modeling the Social Factors That Determine Sustainable Consumption Behavior in the Community of Madrid. *Sustainability* **2018**, *10*, 2811. [[CrossRef](#)]
27. Lazaric, N.; le Guel, F.; Belin, J.; Oltra, V.; Lavaud, S.; Douai, A.; Lazaric, N.; Belin, J.; Oltra, V.; Douai, A. Determinants of Sustainable Consumption in France: The Importance of Social Influence and Environmental Values. *J. Evol. Econ.* **2020**, *5*, 1337–1366. [[CrossRef](#)]
28. Laroche, M.; Bergeron, J.; Barbaro-Forleo, G. Targeting Consumers Who Are Willing to Pay More for Environmentally Friendly Products. *J. Consum. Mark.* **2001**, *18*, 503–520. [[CrossRef](#)]
29. Casimir, G.; Dutilh, C. Sustainability: A Gender Studies Perspective. *Int. J. Consum. Stud.* **2003**, *27*, 316–325. [[CrossRef](#)]
30. Straughan, R.D.; Roberts, J.A. Environmental Segmentation Alternatives: A Look at Green Consumer Behavior in the New Millennium. *J. Consum. Mark.* **1999**, *16*, 558–575. [[CrossRef](#)]
31. Bamburg, S.; Möser, G. Twenty Years after Hines, Hungerford, and Tomera: A New Meta-Analysis of Psycho-Social Determinants of pro-Environmental Behavior. *J. Environ. Psychol.* **2007**, *27*, 14–25. [[CrossRef](#)]
32. Stern, P. Toward a Coherent Theory of Environmentally Significant Behavior. *J. Soc. Issues* **2000**, *56*, 407–424. [[CrossRef](#)]
33. Hansmann, R.; Laurenti, R.; Mehdi, T.; Binder, C.R. Determinants of Pro-Environmental Behavior: A Comparison of University Students and Staff from Diverse Faculties at a Swiss University. *J. Clean. Prod.* **2020**, *268*, 121864. [[CrossRef](#)]
34. Buhl, J.; Liedtke, C.; Teubler, J.; Bienge, K.; Schmidt, N. Measure or Management?—Resource Use Indicators for Policymakers Based on Microdata by Households. *Sustainability* **2018**, *10*, 4467.
35. Dutta, M.; Gupta, P. Relating Emissions of Carbon to Characteristics of Consumption in India. *J. Sustain. Dev. Energy Water Environ. Syst.* **2018**, *6*, 255–275. [[CrossRef](#)]
36. Zhang, J.; Yu, B.; Cai, J.; Wei, Y.-M. Impacts of Household Income Change on CO₂ Emissions: An Empirical Analysis of China. *J. Clean. Prod.* **2017**, *157*, 190–200. [[CrossRef](#)]
37. Ruppert-Stroescu, M.; LeHew, M.L.A.; Connell, K.Y.H.; Armstrong, C.M. Creativity and Sustainable Fashion Apparel Consumption: The Fashion Detox. *Cloth. Text. Res. J.* **2015**, *33*, 167–182. [[CrossRef](#)]
38. Helm, S.; Serido, J.; Ahn, S.Y.; Ligon, V.; Shim, S. Materialist Values, Financial and pro-Environmental Behaviors, and Well-Being. *Young Consum.* **2019**, *20*, 264–284. [[CrossRef](#)]
39. Al-Marri, W.; Al-Habaibeh, A.; Watkins, M. An Investigation into Domestic Energy Consumption Behaviour and Public Awareness of Renewable Energy in Qatar. *Sustain. Cities Soc.* **2018**, *41*, 639–646. [[CrossRef](#)]
40. Anantharaman, M. Elite and Ethical: The Defensive Distinctions of Middle-Class Bicycling in Bangalore, India. *J. Consum. Cult.* **2017**, *17*, 864–886. [[CrossRef](#)]
41. Rakic, M.; Rakic, B. Sustainable Lifestyle Marketing of Individuals: The Base of Sustainability. *Amfiteatru Econ. J.* **2015**, *17*, 891–908.
42. Chekima, B.C.; Syed Khalid Wafa, S.A.W.; Igau, O.A.; Chekima, S.; Sondoh, S.L. Examining Green Consumerism Motivational Drivers: Does Premium Price and Demographics Matter to Green Purchasing? *J. Clean. Prod.* **2016**, *112*, 3436–3450. [[CrossRef](#)]
43. Ritter, Á.M.; Borchardt, M.; Vaccaro, G.L.R.; Pereira, G.M.; Almeida, F. Motivations for Promoting the Consumption of Green Products in an Emerging Country: Exploring Attitudes of Brazilian Consumers. *J. Clean. Prod.* **2015**, *106*, 507–520. [[CrossRef](#)]
44. Heidbrink, L.; Reidel, J. Nachhaltiger Konsum Durch Politische Selbstbindung/Sustainable Consumption by Political Self-Binding. *GAIA-Ecol. Perspect. Sci. Soc.* **2011**, *20*, 152. [[CrossRef](#)]
45. Fischer, D.; Barth, M. Key Competencies for and beyond Sustainable Consumption: An Educational Contribution to the Debate. *GAIA-Ecol. Perspect. Sci. Soc.* **2014**, *23*, 193–200. [[CrossRef](#)]

46. Burlea-Schiopoiu, A.; Ogarca, R.F.; Barbu, C.M.; Craciun, L.; Baloi, I.C.; Mihai, L.S. The Impact of COVID-19 Pandemic on Food Waste Behaviour of Young People. *J. Clean. Prod.* **2021**, *294*, 126333. [[CrossRef](#)]
47. Bilharz, M.; Schmitt, K. Going Big with Big Matters. The Key Points Approach to Sustainable Consumption. *GAIA-Ecol. Perspect. Sci. Soc.* **2011**, *20*, 232–235. [[CrossRef](#)]
48. Stevens, C. *Linking Sustainable Consumption and Production: The Government Role*; Wiley: Hoboken, NJ, USA, 2010.
49. Grunwald, A. Wider Die Privatisierung Der Nachhaltigkeit—Warum Ökologisch Korrekter Konsum Die Umwelt Nicht Retten Kann Against Privatisation of Sustainability—Why Consuming Ecologically Correct Products Will Not Save the Environment. *GAIA-Ecol. Perspect. Sci. Soc.* **2010**, *19*, 178–182. [[CrossRef](#)]
50. Aini, M.S.; Fakhru-Razi, A.; Lad, S.M.; Hashim, A.H. Practices, Attitudes and Motives for Domestic Waste Recycling. *Int. J. Sustain. Dev. World Ecol.* **2002**, *9*, 232–238. [[CrossRef](#)]
51. Geng, D.; Liu, J.; Zhu, Q. Motivating Sustainable Consumption among Chinese Adolescents: An Empirical Examination. *J. Clean. Prod.* **2017**, *141*, 315–322. [[CrossRef](#)]
52. Siebenhüner, B. Kann Die Politik Es Richten? Konsument (Inn) En Als Politische Akteure/Can Politics Solve It? Consumers as Political Actors. *GAIA-Ecol. Perspect. Sci. Soc.* **2011**, *20*, 14. [[CrossRef](#)]
53. Lassassi, M.; Ferrer-I-Carbonell, A.; van den Bergh, J.C.J.M. *A Micro-Econometric Analysis of Determinants of Unsustainable Consumption in The Netherlands*; Springer: Berlin/Heidelberg, Germany, 2004; Volume 27.
54. Mohamed, A.M.A.; Al-Habaibeh, A.; Abdo, H.; Elabar, S. Towards Exporting Renewable Energy from MENA Region to Europe: An Investigation into Domestic Energy Use and Householders' Energy Behaviour in Libya. *Appl. Energy* **2015**, *146*, 247–262. [[CrossRef](#)]
55. Sole, T.; Wagner, C. Understanding Domestic Fuel Use Practices in an Urban Township. *Build. Res. Inf.* **2018**, *46*, 220–230. [[CrossRef](#)]
56. Escoto Castillo, A.; Sánchez Peña, L. Diffusion of Electricity Consumption Practices in Mexico. *Soc. Sci.* **2017**, *6*, 144. [[CrossRef](#)]
57. Claudelin, A.; Järvelä, S.; Uusitalo, V.; Leino, M.; Linnanen, L. The Economic Potential to Support Sustainability through Household Consumption Choices. *Sustainability* **2018**, *10*, 3961. [[CrossRef](#)]
58. Zhang, H.; Lahr, M.L. Households' Energy Consumption Change in China: A Multi-Regional Perspective. *Sustainability* **2018**, *10*, 2486. [[CrossRef](#)]
59. Papargyropoulou, E.; Lozano, R.; Steinberger, J.K.; Wright, N.; bin Ujang, Z. The Food Waste Hierarchy as a Framework for the Management of Food Surplus and Food Waste. *J. Clean Prod.* **2014**, *76*, 106–115. [[CrossRef](#)]
60. Annunziata, A.; Agovino, M.; Ferraro, A.; Mariani, A. Household Food Waste: A Case Study in Southern Italy. *Sustainability* **2020**, *12*, 1495. [[CrossRef](#)]
61. Annunziata, A.; Scarpato, D. Factors Affecting Consumer Attitudes towards Food Products with Sustainable Attributes. *Agric. Econ.* **2014**, *60*, 353–363. [[CrossRef](#)]
62. Gielissen, R.B. Why Do Consumers Buy Socially Responsible Products? *Int. J. Bus. Soc. Sci.* **2011**, *2*, 21–35.
63. Annunziata, A.; Vecchio, R. Consumers' Attitudes towards Sustainable Food: A Cluster Analysis of Italian University Students. *New Mediterr. J. Econ. Agric. Environ. Rev.* **2013**, *12*, 47.
64. Zhao, R.; Zhong, S. Carbon Labelling Influences on Consumers' Behaviour: A System Dynamics Approach. *Ecol. Indic.* **2015**, *51*, 98–106. [[CrossRef](#)]
65. Wakefield, A.; Axon, S. "I'm a Bit of a Waster": Identifying the Enablers of, and Barriers to, Sustainable Food Waste Practices. *J. Clean. Prod.* **2020**, *275*, 122803. [[CrossRef](#)]
66. Chen, T.B.; Chai, L.T. Attitude towards the Environment and Green Products: Consumers' Perspective. *Manag. Sci. Eng.* **2010**, *4*, 27–39.
67. Assarut, N.; Srisuphaolarn, P. Determinants of Green Product Purchase Intentions: The Roles of Environmental Consciousness and Product Attributes. *Chulalongkorn Bus. Rev.* **2010**, *32*, 108–122.
68. Zhu, Q.; Li, Y.; Geng, Y.; Qi, Y. Green Food Consumption Intention, Behaviors and Influencing Factors among Chinese Consumers. *Food Qual. Prefer.* **2013**, *28*, 279–286. [[CrossRef](#)]
69. Van de Ven, D.J.; González-Eguino, M.; Arto, I. The Potential of Behavioural Change for Climate Change Mitigation: A Case Study for the European Union. *Mitig. Adapt. Strateg. Glob. Chang.* **2018**, *23*, 853–886. [[CrossRef](#)]
70. Nguyen, N.; Greenland, S.; Lobo, A.; Nguyen, H.V. Demographics of Sustainable Technology Consumption in an Emerging Market: The Significance of Education to Energy Efficient Appliance Adoption. *Soc. Responsib. J.* **2019**, *15*, 803–818. [[CrossRef](#)]
71. Berry, S.; Whaley, D.; Saman, W.; Davidson, K. Finding Faults and Influencing Consumption: The Role of in-Home Energy Feedback Displays in Managing High-Tech Homes. *Energy Effic.* **2017**, *10*, 787–807. [[CrossRef](#)]
72. Ajzen, I. The Theory of Planned Behavior. *Organ. Behav. Hum. Decis. Process.* **1991**, *50*, 179–211. [[CrossRef](#)]
73. Ajzen, I. From Intentions to Actions: A Theory of Planned Behavior. In *Action Control*; Springer: Berlin/Heidelberg, Germany, 1985; pp. 11–39.
74. Wang, B.; Li, J.; Sun, A.; Wang, Y.; Wu, D. Residents' Green Purchasing Intentions in a Developing-Country Context: Integrating PLS-SEM and MGA Methods. *Sustainability* **2020**, *12*, 30. [[CrossRef](#)]
75. Vining, J.; Ebreo, A. Predicting Recycling Behavior from Global and Specific Environmental Attitudes and Changes in Recycling Opportunities 1. *J. Appl. Soc. Psychol* **1992**, *22*, 1580–1607. [[CrossRef](#)]

76. Tölkes, C.; Butzmann, E. Motivating Pro-Sustainable Behavior: The Potential of Green Events-A Case-Study from the Munich Streetlife Festival. *Sustainability* **2018**, *10*, 3731. [[CrossRef](#)]
77. Bauer, D.; Arnold, J.; Kremer, K. Consumption-Intention Formation in Education for Sustainable Development: An Adapted Model Based on the Theory of Planned Behavior. *Sustainability* **2018**, *10*, 3455. [[CrossRef](#)]
78. Penz, E.; Hartl, B.; Hofmann, E. Explaining Consumer Choice of Low Carbon Footprint Goods Using the Behavioral Spillover Effect in German-Speaking Countries. *J. Clean. Prod.* **2019**, *214*, 429–439. [[CrossRef](#)]
79. UNEP. *HERE and NOW! Education for Sustainable Consumption Recommendations and Guidelines*; UNEP: Rome, Italy, 2010.
80. Klöckner, C.A. A Comprehensive Model of the Psychology of Environmental Behaviour—A Meta-Analysis. *Glob. Environ. Chang.* **2013**, *23*, 1028–1038. [[CrossRef](#)]
81. Morren, M.; Grinstein, A. Explaining Environmental Behavior across Borders: A Meta-Analysis. *J. Environ. Psychol.* **2016**, *47*, 91–106. [[CrossRef](#)]
82. Hertwich, E.G.; Peters, G.P. Carbon Footprint of Nations: A Global, Trade-Linked Analysis. *Env. Sci. Technol.* **2009**, *43*, 6414–6420. [[CrossRef](#)]
83. Liobikiėnė, G.; Poškus, M.S. The Importance of Environmental Knowledge for Private and Public Sphere Pro-Environmental Behavior: Modifying the Value-Belief-Norm Theory. *Sustainability* **2019**, *11*, 3324. [[CrossRef](#)]
84. Michelsen, G.; Fischer, D. Sustainability and Education 1. In *Sustainable Development Policy: A European Perspective*; Taylor and Francis: London, UK, 2017; pp. 135–158.
85. Otto, S.; Pensini, P. Nature-Based Environmental Education of Children: Environmental Knowledge and Connectedness to Nature, Together, Are Related to Ecological Behaviour. *Glob. Environ. Change* **2017**, *47*, 88–94. [[CrossRef](#)]
86. Salehi, S.; Pazuki Nejad, Z.; Mahmoudi, H.; Knierim, A. Gender, Responsible Citizenship and Global Climate Change. *Women's Stud. Int. Forum* **2015**, *50*, 30–36. [[CrossRef](#)]
87. Barth, M.; Adomßent, M.; Fischer, D.; Richter, S.; Rieckmann, M. Learning to Change Universities from within: A Service-Learning Perspective on Promoting Sustainable Consumption in Higher Education. *J. Clean. Prod.* **2014**, *62*, 72–81. [[CrossRef](#)]
88. Kopnina, H. An Exploratory Case Study of Dutch Children's Attitudes toward Consumption: Implications for Environmental Education. *J. Environ. Educ.* **2013**, *44*, 128–144. [[CrossRef](#)]
89. Zsóka, Á.; Szerényi, Z.M.; Széchy, A.; Kocsis, T. Greening Due to Environmental Education? Environmental Knowledge, Attitudes, Consumer Behavior and Everyday pro-Environmental Activities of Hungarian High School and University Students. *J. Clean. Prod.* **2013**, *48*, 126–138.
90. Nässén, J. Determinants of Greenhouse Gas Emissions from Swedish Private Consumption: Time-Series and Cross-Sectional Analyses. *Energy* **2014**, *66*, 98–106. [[CrossRef](#)]
91. Yang, S.; Zhang, Y.; Zhao, D. Who Exhibits More Energy-Saving Behavior in Direct and Indirect Ways in China? The Role of Psychological Factors and Socio-Demographics. *Energy Policy* **2016**, *93*, 196–205. [[CrossRef](#)]
92. Tanner, C.; Kast, S.W. Promoting Sustainable Consumption: Determinants of Green Purchases by Swiss Consumers. *Psychol. Mark.* **2003**, *20*, 883–902. [[CrossRef](#)]
93. Chekima, B.; Chekima, S.; Wafa, S.A.W.S.K.; Igaua, O.A.; Sondoh, S.L. Sustainable Consumption: The Effects of Knowledge, Cultural Values, Environmental Advertising, and Demographics. *Int. J. Sustain. Dev. World Ecol.* **2016**, *23*, 210–220. [[CrossRef](#)]
94. Kollmuss, A.; Agyeman, J. Mind the Gap: Why Do People Act Environmentally and What Are the Barriers to pro-Environmental Behavior? *Env. Educ. Res.* **2002**, *8*, 239–260. [[CrossRef](#)]
95. Shittu, O. Emerging Sustainability Concerns and Policy Implications of Urban Household Consumption: A Systematic Literature Review. *J. Clean. Prod.* **2020**, *246*, 119034. [[CrossRef](#)]
96. Longo, C.; Shankar, A.; Nuttall, P. "It's Not Easy Living a Sustainable Lifestyle": How Greater Knowledge Leads to Dilemmas, Tensions and Paralysis. *J. Bus. Ethics* **2019**, *154*, 759–779. [[CrossRef](#)]
97. Collins, A.; Galli, A.; Hipwood, T.; Murthy, A. Living within a One Planet Reality: The Contribution of Personal Footprint Calculators. *Environ. Res. Lett.* **2020**, *15*, 025008. [[CrossRef](#)]
98. Álvarez-Suárez, P.; Vega-Marcote, P.; Garcia Mira, R. Sustainable Consumption: A Teaching Intervention in Higher Education. *Int. J. Sustain. High. Educ.* **2013**, *15*, 3–15. [[CrossRef](#)]
99. Arbuthnott, K.D. Education for Sustainable Development beyond Attitude Change. *Int. J. Sustain. High. Educ.* **2009**, *10*, 152–163. [[CrossRef](#)]
100. Thomas, R.E.W.; Teel, T.; Bruyere, B.; Laurence, S. Metrics and Outcomes of Conservation Education: A Quarter Century of Lessons Learned. *Environ. Educ. Res.* **2019**, *25*, 172–192. [[CrossRef](#)]
101. Vicente-Molina, M.A.; Fernández-Sáinz, A.; Izagirre-Olaizola, J. Environmental Knowledge and Other Variables Affecting Pro-Environmental Behaviour: Comparison of University Students from Emerging and Advanced Countries. *J. Clean. Prod.* **2013**, *61*, 130–138. [[CrossRef](#)]
102. Boca, G.D.; Saraçlı, S. Environmental Education and Student's Perception, for Sustainability. *Sustainability* **2019**, *11*, 1553. [[CrossRef](#)]
103. Petry, R.A.; Fadeeva, Z.; Fadeeva, O.; Hasslöf, H.; Hellström, Å.; Hermans, J.; Mochizuki, Y.; Sonesson, K. Educating for Sustainable Production and Consumption and Sustainable Livelihoods: Learning from Multi-Stakeholder Networks. *Sustain. Sci.* **2011**, *6*, 83–96. [[CrossRef](#)]

104. Gombert-Courvoisier, S.; Sennes, V.; Ricard, M.; Ribeyre, F. Higher Education for Sustainable Consumption: Case Report on the Human Ecology Master's Course (University of Bordeaux, France). *J. Clean. Prod.* **2014**, *62*, 82–88. [[CrossRef](#)]
105. Albareda-Tiana, S.; García-González, E.; Jiménez-Fontana, R.; Solís-Espallargas, C. Implementing Pedagogical Approaches for ESD in Initial Teacher Training at Spanish Universities. *Sustainability* **2019**, *11*, 4927. [[CrossRef](#)]
106. Valor, C.; Antonetti, P.; Merino, A. The Relationship between Moral Competences and Sustainable Consumption among Higher Education Students. *J. Clean. Prod.* **2020**, *248*, 119161. [[CrossRef](#)]
107. Barth, M.; Fischer, D. Key Competencies for Sustainable Consumption. In Proceedings of the 2nd PERL International Conference—Beyond Consumption: Pathways to Responsible Living, Berlin, Germany, 19–20 March 2012; pp. 65–79.
108. Barth, M.; Godemann, J.; Rieckmann, M.; Stoltenberg, U. Developing Key Competencies for Sustainable Development in Higher Education. *Int. J. Sustain. High. Educ.* **2007**, *8*, 416–430. [[CrossRef](#)]
109. Frisk, E.; Larson, K. Educating for Sustainability: Competencies & Practices for Transformative Action. *J. Sustain. Educ.* **2011**, *2*, 3.
110. Rieckmann, M. Future-Oriented Higher Education: Which Key Competencies Should Be Fostered through University Teaching and Learning? *Futures* **2012**, *44*, 127–135. [[CrossRef](#)]
111. Segalàs, J.; Ferrer-Balas, D.; Mulder, K.F. What Do Engineering Students Learn in Sustainability Courses? The Effect of the Pedagogical Approach. *J. Clean. Prod.* **2010**, *18*, 275–284. [[CrossRef](#)]
112. Wiek, A.; Withycombe, L.; Redman, C.L. Key Competencies in Sustainability: A Reference Framework for Academic Program Development. *Sustain. Sci.* **2011**, *6*, 203–218. [[CrossRef](#)]
113. Bransford, J.D.; Brown, A.L.; Cocking, R.R. *How People Learn*; National Academy Press: Washington, DC, USA, 2000; Volume 11.
114. Kolb, A.Y.; Kolb, D.A. Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education. *Acad. Manag. Learn. Educ.* **2005**, *4*, 193–212. [[CrossRef](#)]
115. Schön, D.A. *The Reflective Practitioner: How Professionals Think in Action*; Routledge: London, UK, 2017; ISBN 1315237474.
116. Ferrer-Balas, D. Global Environmental Planning at the Technical University of Catalonia. *Int. J. Sustain. High. Educ.* **2004**, *5*, 48–62. [[CrossRef](#)]
117. Herrmann, M. The Practice of Sustainable Education through a Participatory and Holistic Teaching Approach. *Commun. Coop. Particip. Res. Pract. Sustain. Future* **2007**, *1*, 72–87.
118. Lipscombe, B.P. Exploring the Role of the Extra-curricular Sphere in Higher Education for Sustainable Development in the United Kingdom. *Environ. Educ. Res.* **2008**, *14*, 455–468. [[CrossRef](#)]
119. Winter, J.; Cotton, D. Making the Hidden Curriculum Visible: Sustainability Literacy in Higher Education. *Environ. Educ. Res.* **2012**, *18*, 783–796. [[CrossRef](#)]
120. Leroux, J.A.; Lafleur, S. Employability Skills: The Demands of the Workplace. *Vocat. Asp. Educ.* **1995**, *47*, 189–196. [[CrossRef](#)]
121. Bringle, R.G.; Hatcher, J.A. Institutionalization of Service Learning in Higher Education. *J. High. Educ.* **2000**, *71*, 273–290. [[CrossRef](#)]
122. Hartlieb, S.; Jones, B. Humanising Business through Ethical Labelling: Progress and Paradoxes in the UK. *J. Bus. Ethics* **2009**, *88*, 583–600. [[CrossRef](#)]
123. Zen, I.S.; Subramaniam, D.; Sulaiman, H.; Saleh, A.L.; Omar, W.; Salim, M.R. Institutionalize Waste Minimization Governance towards Campus Sustainability: A Case Study of Green Office Initiatives in Universiti Teknologi Malaysia. *J. Clean. Prod.* **2016**, *135*, 1407–1422. [[CrossRef](#)]
124. Gilbert, R.; Stevenson, D.; Girardet, H.; Stren, R. *Making Cities Work: Role of Local Authorities in the Urban Environment*; Routledge: London, UK, 2013; ISBN 1315066432.
125. Adger, W.N.; Jordan, A. *Governing Sustainability*; Cambridge University Press: Cambridge, UK, 2009; ISBN 1316104168.
126. Velazquez, L.; Munguia, N.; Ojeda, M. Optimizing Water Use in the University of Sonora, Mexico. *J. Clean. Prod.* **2013**, *46*, 83–88. [[CrossRef](#)]