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The Knowledge, Attitude, and Practice of the Adoption of Green Fashion Innovation

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Abstract: Environmental pollution from garment manufacturing is a major concern due to its widely-felt impact on climate change. Consequently, the researchers set about assessing KAP (Knowledge, Attitude and Practice) and its relationship with, and impact on, green fashion innovation adoption among Jordanian companies. This work examined the relationship between the independent variables, represented by KAP, and the dependent variable, which was Green Fashion Innovation Adoption in Jordan. A quantitative approach utilized a cross-sectional survey to gather primary data from upper and middle-level management in Jordanian garment companies. The sample size was 257 valid questionnaires. The results showed a statistically significant impact of knowledge and attitude toward green fashion innovation adoption, but failed to identify a statistically significant impact of practice on the same. This research contributes positively to the diffusion of awareness about going green in innovative methods and systems in Jordan's garment industry, and provides suggestions to practitioners.

1. Introduction

Becoming environmentally friendly is a fundamental and noteworthy concern of the cutting-edge world [1]. Today, even though environmental awareness is more prevalent among the global community, both in the workplace and at home, many people are ignorant of modern practices used in the garment industry and have precious little knowledge of the ecological impacts of the production of synthetic fiber and concentrated cotton [2]. However, the garment industry in Jordan has expanded rapidly in the recent years, also the percentage of workers in the garment sector who are Jordanian has reached about 20 percent. Moreover, a high percentage of Jordanians with low educational attainment are going towards the garment industry. The industry has enjoyed enormous growth since 1996 when garments manufactured in Jordan were first granted preferential duty free and quota free access to the United States. The garment industry typically has its biggest economic impact in developing countries transitioning from an agrarian society to low-level manufacturing [3]. Furthermore, the garment sector has attracted Jordanian female labor forces.

Also, the most frequently used definition of sustainable fashion is "clothing, shoes, and accessories that are manufactured, marketed, and used in the most sustainable manner. In practice, this implies continuous work to improve all stages of a product's life cycle, from design, raw material production,

manufacturing, transport, storage, marketing, and final sale, to use, reuse, repair, remake, and recycling of the product and its components" [4]. The ultimate goal is to decrease the unwanted environmental consequences of all manufacturing processes by ensuring that natural resources are used efficiently and responsibly (soil, water, biodiversity, animals, energy, ecosystems, plants, land, among others) while maximizing the utilization of renewable energy sources such as solar and wind energy, and increasing recycling of product components.

According to Caniato et al. [5] environmental sustainability has become a key issue to managers. Also, practitioners face a challenge of achieving a balance between a business needs and the environment. The fashion industry is one of the industries that is most exposed to the public. Therefore, fashion companies are held responsible for environmental problems that caused by themselves and by their suppliers. Accordingly, companies are encouraged to adopt green practices that can improve environmental sustainability. Also, green supply chain practices provide a practical approach when combined with industry practices to prevent pollution and waste. Firms can improve their economic performance with green supply chain practices through establishing a recovering and recycling system [6]. A study conducted by Li et al. [7] focuses on assisting companies to enhance environmental awareness and green manufacturing practices. The study found that corporate stakeholders can have a positive impact on practice performance through green manufacturing. In addition, companies should improve their green manufacturing technology to ensure smooth implementation of green manufacturing practices. According to Wu et al. [8] a selected stand-alone practice of green, lean, and Corporate Social Responsibility (CSR) management systems has a positive impact on firm sustainability performance. Furthermore, consumers often have positive attitudes about green marketing. Thus, marketers can use communication techniques to set up their tone for sustainable fashion marketing. Based on balance theory, environmental priming can increase consumer preferences for fashion products with green logos. Based on the study that was conducted by Lee et al. [9], the green logo effect causes significant activations in the anterior cingulate cortex (ACC).

All employees and stakeholders should cooperate in developing a work environment that aligns their company's green strategy with all factory processes and evolving a code of conduct and good ethics. The onus is on all companies working in the garment manufacturing area to promote green behavior by paying attention to every stage of the process, including how fabrics are washed and how the water used in the manufacturing process is disposed of Green Strategy [4]. Most garment manufacturing companies have realized that they can set themselves apart in the market by introducing green fashion items, and sustainable fashion requires constant innovation. Innovation could include 3D printing, biotechnology, artificial intelligence, and wearables. Thus, sustainable fashion innovation can thrive with the help of biology and research on technology for sustainable materials. Developments in wearable electronic systems have fostered sustainable fashion innovations that enable creative designers to integrate them into stunning fashion designs and clothes that interact with the wearer.

Green fashion innovation adoption has the potential to protect the environment. All around us, social structures are being reshaped as people are becoming more socially conscious and responsible consumers. As part of this process, the fashion landscape has already witnessed a rapid increase in the number of innovative fashion designers using science, biology, and technology to design sustainable fashion clothes. Garment designers are creating innovative clothing, which helps to protect and nurture nature and the environment, as well as looking good.

In green fashion, innovation prompts the taking of raw materials from nature, which are then returned to nature. Vehmas et al. [2] asserted that environmental effects could be decreased by switching from currently used processes to new ones which focus on the reuse and recycling of materials. If old products can be recycled, composted, or reused, then the short life cycle of stylish clothing can be mitigated. Furthermore, if products are properly developed, then they can help to feed the ecosystem at the end of their useful lives rather than polluting and destroying that ecosystem [2].

Contributing to environmental sustainability requires more than merely reducing the production and consumption of fashion goods. Indeed, reducing production might cause social unrest should

goods become less available. The adoption of green fashion innovations must, therefore, focus on real, sustainable growth and development, and the creation of innovative products that will furnish a fashion consumer with a multitude of environmentally friendly choices.

For all these reasons, KAP (Knowledge, Attitude, and Practice) in the Jordanian garment industry must be assessed alongside the relationship with the adoption of green fashion innovations. The research problems focus on assessing knowledge, attitude, and practice toward sustainable innovation adoption in the garment industry in Jordan. This research seeks to answer the question:

"What is the impact of KAP on the adoption of green fashion innovations?"

2. Theoretical Framework and Hypotheses Development

2.1. Knowledge, Attitude, and Practice (KAP)

The KAP model encompasses three pillars, which are knowledge, attitude, and practice. The first pillar, knowledge, is one of the fundamental means that an individual uses to make sense of his/her own self and the world in which he/she lives. Knowledge allows him/her to understand, compare, analyze, interact, relate to, act upon, and interpret the ego, nature, and fellow human beings. In the 21st century, knowledge impacts all areas of an organization [10,11].

In a business context, Usai et al. [12] argued that knowledge was a major asset for a company. Knowledge becomes the capability of an entity when that knowledge is incorporated and stored in a company. Kagaari et al. [13] asserted that skills based on the company's knowledge, which are developed over time, are based on the experiences and structure of the labor force and become a valuable asset.

Knowledge of green products and their impacts on sustainability have become critical issues today. Several new green business management concepts, in the areas of manufacturing, advertising, accounting, innovation, and design, are being developed to allow businesses to exploit environmental opportunities [14,15]. In addition, Rogers [16] debated how managers and leaders of an organization are important and essential to the diffusion of knowledge that influences the attitudes and practices of their subordinates. Thus, when managers remain informed about green innovation, this knowledge will minimize surprises and enhance the credibility of a change [17].

Attitude is the second part of the KAP model. Allport [18] defined an attitude as: "A mental and neural state of readiness, which exerts a directing influence upon the individual's response to all objects and situations to which it is related." Also, Chen and Chai [19] argued that attitudes are the most coherent reason for anticipating the readiness of users to pay for green products. Ho and Choi [20] noted that as the range of green projects expands to cover multiple types of products, this presents both opportunities and difficulties. Long-term objectives and obligations should be calibrated to achieve optimal and sustainable short- and long-term advantages of both a tangible and intangible nature.

Hartmann et al. [21] asserted that positioning strategy should still be focused on a product's relevant environmental benefits, particularly in comparison to conventional products. This could include manufacturing processes, product utilization, and/or product elimination. Their results showed an overall favorable impact on the brand attitude of the green brand positioning [22]. In an experimental study examining green advertisements, Fernando et al. [23] found that consumers responded to messages that evoked an element of concern for the state of the environment. This information helped advertisers to create messages that prompted greater consumer involvement. There is a knock-on effect as a call to action in one green behavioral environment invariably prompts a person with powerful green behavioral standards to branch out into other areas [24].

Practice is the last part of the KAP model. The Theory of Reasoned Action states that notion influences practice. Our notions on any given topic are built upon personal norms and learned or inherited attitudes [25]. However, concerning business practices, Strategic Direction [26] noted that whether in the manufacturing, financial, or service industries in the contemporary worldwide economy, businesses depend on ongoing innovations that result in changes in practice to remain viable in a

competitive market. A business may well generate creative thoughts, but a significant problem arises should it lack efficiency in implementing those thoughts, because the marketing of an idea is what innovation is all about [26]. Therefore, as Craig and Allen [27] argued, the success of any innovation is related to management change.

Specialized green manufacturers and distributors have appeared and competed with several mainstream businesses to promote this sector, who have also initiated green consumer initiatives [28]. However, Haden et al. [29] asserted that if a product is manufactured and supplied in an eco-friendly way, then a consumer must be persuaded of its increased value and quality [2].

Haden et al. [29] noted that green management involves engaging in practices that generate products that are environmentally-friendly, minimize negative impacts on the environment, and practicing green manufacturing, green research and development, and green marketing. Indeed, many successful companies, like 3M and Body Shop, have integrated environmental sustainability into their strategic plans and implemented sustainable ideas in their routine work [14].

Going green has also become an integral part of marketing strategies. For example, Chen and Chai [19] argued that many companies gained an advantage in their markets by exploiting green marketing. According to Cervellon and Wernerfelt [30], some companies had recognized the need for greener practices as part of a strategy to reach environmentally aware consumer groups. As a result, companies should continually build on these groups and prove the existence of transparency in their sustainability practices [24,31].

2.2. Green Fashion Innovation Adoption

Hur [32] noted that "These environmental and social impacts occur at every stage of the product life cycle including cultivation and processing of the textiles (manufacturing yarn, fabric, dyeing, and finishing), clothing production, distribution, maintaining the product during use or reuse, and final disposal".

In order to remain in business, sustainable fashion companies must make their clothing lines their top priority. However, they should also apply efforts to ensure they have a supply chain which is environmentally sustainable. Companies can gain a competitive advantage through the adoption of innovations related to sustainability, and innovation has drawn significant interest for enhancing the competitive advantage of many organizations in recent years [25]. The demands of progressively competitive markets and the need to gain competitive advantage have driven this explosion in interest [33]. As a result, fashion and textile fairs often focus on green opportunities and benefits [20]. Furthermore, Cervellon and Wernerfelt [30] argued that consumers that actively seek to purchase from the sector of the fashion industry that seeks to be environmentally friendly base their decisions on a desire to preserve the environment and improve the welfare of society.

Previously, some fashion house managers held a view that greening may be a passing phase that would not find sustained success in the market. However, the desire of some consumers to be socially responsible and utilize green fashion channels has put pressure on the more traditional fashion houses and, as a result, companies are now engaging in sustainable strategies [30,34]. Also, Kozlowski et al. [35] noted that, despite a recent increase in the volume of research surrounding sustainable fashion, there remains a gap in knowledge regarding how the notion of sustainability can be integrated into the design and marketing practices of a successful fashion company, and how it affects consumer expenditure.

Traditionally, fashion items live a short life in the market before being replaced by the latest trend, a fact which inevitably results in wasted materials. Green fashion, on the other hand, implicitly demands that products be durable, made from sustainable resources, and open to recycling [36]. Interestingly, when Cervellon and Wernerfelt [30] monitored fashion blogs, they found that as time passed, knowledge content became more objective and interest grew in knowing about the entire supply chain. Such bloggers wanted information about where the materials were sourced,

how manufacturing was carried out, and the mechanism by which goods were transported and distributed. An important issue was whether products could be either reused or recycled.

Ho and Choi [20] emphasized that sustainability is possible if certain methods are applied to operational and manufacturing procedures. All efforts should be made to reduce energy use and waste production, and reusable or recyclable materials should be used whenever possible. It is desirable that companies target both achievable and beneficial environmental goals.

Among other methods, the fashion industry can ensure sustainability through recycling. The Hong Kong Trade Development Council (HKTDC) [37] defines recycling as "the process by which materials are collected, processed into reusable forms and subsequently used as raw materials for new products." New technologies can be introduced to promote recycling.

The process of recycling can be facilitated when materials and components can be easily separated and taken apart [38]. By following the Design for Environment (DFE) guidelines, designers can initially create environmentally-friendly products. This is more cost-efficient than trying to redesign an already existing product that is harmful to the environment [39]. Built upon this information gained from the literature review, the study poses the following hypothesis:

Hypothesis 1. (H1) *There is no statistically significant impact of (KAP) knowledge, attitude, and practice toward green fashion innovation adoption.*

2.3. Knowledge toward Green Fashion Innovation Adoption

The last decade has witnessed increased research on sustainable clothing manufacture, thus supplying new knowledge about sustainable clothing and the consequences of clothes production [32]. However, reviews that are accurate, concrete, and have objective knowledge of sourcing, manufacturing, logistics, classifying, and delivery provide value. In the final analysis of Ewing [40], intense activity among online blog participants could be a real source of ideas and innovation for fashion manufacturers. A study by Fisher et al. [41] suggested that participants in such communities have the tendency to consider their behavior and show a willingness to amend it in the face of knowledge. This is particularly true when they obtain a true picture of the implications to the environment and society of clothing production and laundering.

The nature of shared knowledge is multiple. In general, the layperson holds a very naive and simplistic view of green fashion and its importance [30]. Vehmas et al. [2] asserted that most individuals possess little knowledge about garment production or the environmental implications of artificial fibers and intensive cotton manufacturing. Even many retailers are unaware of the definition of green fashion and remain uncertain about the precise meanings of environmental or organic claims [35].

Anderson [42] suggested a multi-step process for any company that aims to engage in green garment manufacturing. This process begins with establishing zero waste, requires an organization to examine the manufacturing process itself to find methods of eliminating damaging emissions, generating and using renewable energy and redesigning goods, developing recycling procedures, and transporting raw materials from production facilities and finished products to the market. In this process, a business will undoubtedly need to make some major changes to its strategy, procedures, and structure.

Some studies have examined the spread of information via online communities. For example, Cervellon and Wernerfelt's research [30] revealed that the broad and effective spread of knowledge about green fashion online could help to develop an understanding of the positive conceptions of green fashion in some areas. Few studies have focused on behavioral aspects of green fashion, which are concerned with providing information on supply chain activities, specific data of environmental protection arguments, and labels that provide these environmentally-friendly arguments. However, Cervellon and Wernerfelt [30] found that green fashion labels did facilitate consumer choice and gave them information.

Luzio and Lemke [43] stressed that product design requires an understanding of the consumption cycle of products, their use, and their disposal. The lack of specific information on the country of origin or supply chains from manufacturers and retailers sometimes leads to confusion. Thus, accountability for the origin of environmentally friendly goods from distribution channels must exist [30].

Kozar and Hiller [44] used an environmental apparel knowledge scale starting with knowledge assessments of chemical emissions contained in fabric. They also take into account the extent to which garments are recyclable and biodegradable before looking at regulations governing clean air and water. The participants in the study did not show a high level of interest regarding choosing to purchase clothing manufactured under a green policy. However, those who did choose to go green were found to possess better knowledge and attitudes on the topic. The study urged companies to work on removing obstacles that may prevent consumers from making a conscious decision to buy green fashions, such as perceived higher prices of such goods when compared to traditionally produced items [45].

However, the fashion industry seems to be indirectly discouraged from spreading knowledge about sustainable practices, which could affect the attitudes and behaviors of community members. Wu and Sukoco [46] argued that studies have also shown that the diffusion of knowledge strongly influences changes in attitude and behavior. They noted that online communities can create a co-production of information. An individual sharing the knowledge that he/she has gained via the community can provide valuable feedback to the producer regarding making a product more user-friendly or improving its quality [46–48].

According to Kozar and Hiller [44], that fact that consumers possess knowledge and a concern for the environment and society does not necessarily mean that they will choose to buy green products. This becomes clear when one takes a closer look at the relationship between knowledge held about the impact of the fashion industry on the environment and buying practice. The first sub-hypothesis in this research was derived from the literature review:

Hypothesis 1a. (H1a) *There is no statistically significant impact of knowledge on the adoption of green fashion innovation.*

2.4. Attitude toward Green Fashion Innovation Adoption

Chi (2015) determined that the most important factors influencing purchasing decisions among consumers are the price and quality of garments. Emotional and social values were found to be of lesser importance. Interestingly, a growing number of Chinese consumers are altering their purchasing behaviors hoping to promote environmental protection. Furthermore, they believe that they can find social approval through their decision to buy environmentally-friendly [49,50].

Hartmann and Apaolaza–Ibáñez [51] argued that the purchasing of green fashion items can be encouraged if companies appeal to consumers' psychology, offering experiential and symbolic, as well as utilitarian benefits. Sales may rise as companies strive to address issues such as brand image, quality, sustainable pricing, and labeling. Additional trends towards sustainable purchase behavior have emerged over time. Some people are choosing to make their own fashion items rather than buy mass produced garments. There is an interesting development known as Trashion, whereby people are using discarded items to create fashion pieces and other objects. Others opt to seek out and buy vintage fashion, and yet others have made a return to local traditional fashions [52]. Luxury brands are investing their efforts in producing CE marked products. CE is a stamp used within the European Economic Area to indicate that goods conform to health, safety, and environmental protection standards. For example, Stella McCartney has put together a shoe collection manufactured using recycled and biodegradable plastic. There is a cultural aspect to how different people perceive ethical fashion [53]. In the United Kingdom, for example, garments with a more expensive price tag are deemed to be of better quality. French people, on the other hand, see a higher price as a status symbol. Individuals who enjoy a more elevated status are able to buy more expensive apparel.

The time has come to examine what consumers' desires and expectations are when it comes to eco-fashion [54]. Fashion houses aiming to move forward with their green product lines in a sustainable manner need to focus on consumer values and work on increasing consumer satisfaction [55,56]. Niinimäki and Hassi [55] talked about creating emotional, cultural, and social value, beyond the traditional concept of product value. This can be achieved by demonstrating that the product promotes sustainable development and will continue to be of value into the future. The second sub-hypothesis of this research was derived from this literature as:

Hypothesis 1b. (H1b) *There is no statistically significant impact of attitude toward the adoption of green fashion innovation.*

2.5. Practice toward the Adoption of Green Fashion

Lee [25] argued that, generally, innovations are adopted after an initial assessment. Upon the assessment meeting approval, the innovation will subsequently be applied on a regular basis. Moreover, Mele and Russo–Spena [57] argued that practice is an inward and outer-linked way of doing things. Moreover, the application of the terms ethics and fashion sustainability to the fast-fashion industry seems to be an oxymoron [58]. Strategic Direction [26] argued that real innovation is still something that usually happens by chance for most businesses. Few organizations have overcome the barriers and created omnipresent and sustainable processes for innovation [59].

The aim of the fashion industry has historically been to continuously create fresh styles and designs that appear briefly in the shops at low prices [2]. Consequently, textile manufacturing has earned a reputation as being one of the world's worst polluters. Nowadays, the green fashion houses are striving to bring about change, using sustainable resources and manufacturing items that can be used or recycled to fresh fibers. The latter is something of a fresh phenomenon [60].

Dahlbo et al. [61] looked to the reuse and recycling of textiles as a way to reduce the quantity of fresh fabric being manufactured from virgin materials. They also saw the need to minimize the amount of water, energy, and chemicals used in the manufacturing of fabrics. It is anticipated that, in the near future, companies will be required to provide sustainability reports. The labeling on garments will indicate the level of harm that their manufacture causes; for instance, the labels show how much water is consumed in the production of regular t-shirts in comparison with their environmental-responsive counterparts [2]. Some brand names are already making great strides. Viktor and Rolf have designed an entire collection using fabrics from previous collections. G-Star RAW is making jeans using unwashed, untreated denim, and Adidas are manufacturing training shoes using plastic that has been retrieved from the oceans of the world [2].

Ho and Choi [20] argued that fashion and textile suppliers are working on making the green practices of recycling and reuse standard procedure. Shedroff [38] pointed out that although it is a natural fiber, cotton is not a candidate for being recycled in compost or recycling bins, and the same can be said of artificial fibers such as rayon. The widespread use of these fabrics forms a challenge to the industry. Ho and Choi [20] focused on reuse, defining it as the repeat usage of items in their original form. Rather than discarding unwanted items, one can extended their useful life by reusing them. Items that are open to reuse include dress pins, sewing needles, and packaging materials. Within the garment industry, there is a possibility of reusing various fastening parts, such as buttons [38]. The third sub-hypothesis of the current research was prompted by this literature review:

Hypothesis 1c. (H1c) *There is no statistically significant impact of practice on the adoption of green fashion innovation.*

3. Research Model

This study explored the impact of KAP (knowledge, attitude, and practice) on the adoption of green fashion innovation. This study builds its model on the previous literatures of Zhu and Sarkis (2004), Zhu and Sarkis (2007), Sarkis et al. (2011), Zhu et al. (2011), Dubey et al. (2015), de Camargo Fiorini and Jabbour (2017), and Dubey et al. (2017) [62–68]. According to Sarkis et al. [64] green supply chain management (GSCM) has gained increasing attention in recent years. Green supply chain management (GSCM) has become an emergent ecological modernization tool. Also, ecological modernization at the society level is influenced by restructuring policies and regulations. Some of these policies and regulations are focusing on enhancing energy savings and pollution reduction, which supports the KAP model [65]. A study conducted by Zhu and Sarkis [62] supports the green movement in supply chain management. Green supply chain management (GSCM) is emerging to be an important approach to improve environmental performance.

The model in Figure 1 shows the dependent and independent variables and the main and sub hypotheses mentioned in the literature review.
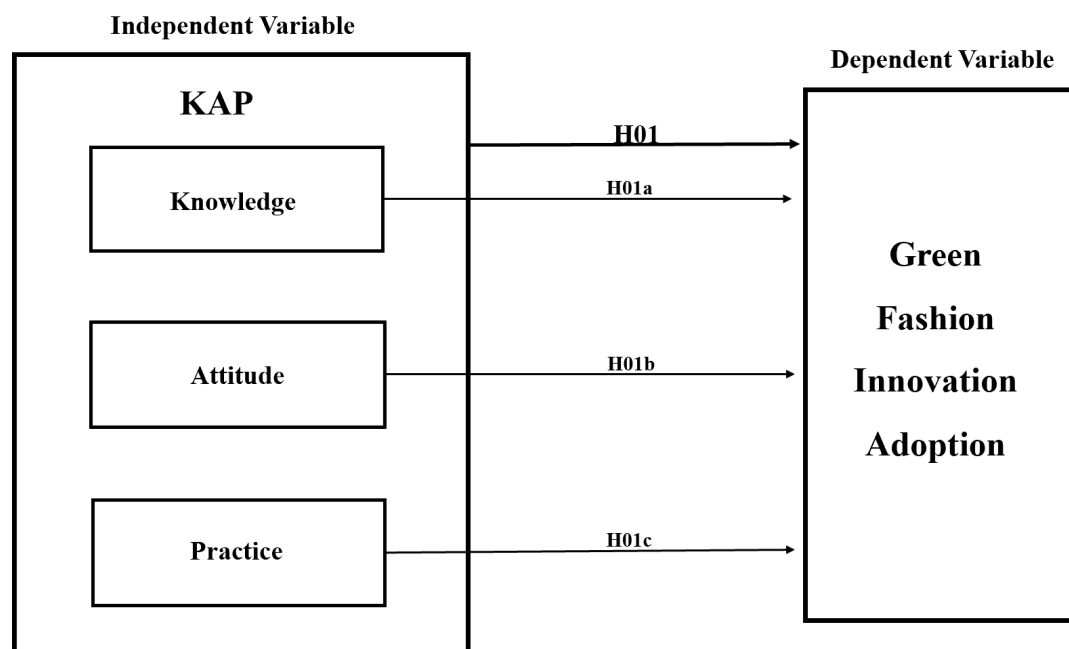
Figure 1. Research Model. Source: Developed based on the research by Launiala (2009) and Bano et al. (2013) [69,70].

4. Research Methods

The research relied on a descriptive-analytical method using convenience sampling to analyze and classify the data to achieve the objectives of the study and to identify the variables of the study.

4.1. Research Population

The research population consisted of members of upper and middle management of garment companies in Jordan's three major cities: Amman, Irbid, and Zarqa. The research population included 524 garment manufacturing companies in Jordan. Therefore, the sample included 408 individuals who held the various positions of Factory Manager, Production Manager, Sales & Marketing Manager, Line Supervisor, Logistics Manager, and Product Manager (Design & Quality Assurance). The survey was distributed to the entire research population, but due to a large amount of missing data, only 257 (62.9%) of the surveys were suitable for analysis.

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4.2. Reliability

The researchers developed a questionnaire to cover all dimensions of the independent and dependent study variables in a way that enabled hypothesis testing. Hence, to increase the degree of reliability and validity of the data collected, the researcher relied, as much as possible, on measuring the variables of the current study drawn from previous research, which proved their validity and reliability. Indeed, the research measures were adapted from Launiala [69] and Bano et al. [70]. The responses of the study sample were distributed according to a 5-point Likert-type scale, which indicates the extent of a respondent's agreement with the questionnaire statements (5 = Strongly agree, 4 = Agree, 3 = No strong opinion, 2 = Disagree, and 1 = Strongly disagree).

Cronbach's alpha was used to measure internal consistency to ensure that the questionnaire was valid as a data collection tool for the study and to measure the level of internal consistency of the resolution statements. Table 1 shows that:

Table 1. Internal Consistency Coefficients (Cronbach Alpha).

Variables	Stability Coefficient
Knowledge	0.910
Attitude	0.823
Practice	0.872
Green Fashion Innovation Adoption	0.910
Total	**0.956**

As shown in the above Table, reliability testing was done and the value of Cronbach Alpha was 0.956. Table 1 shows the Cranach's alpha values, which were used to determine the internal consistency reliability of the elements. Reliability should be (0.60) or higher to indicate adequate convergence or internal consistency [71].

4.3. Validity

In statistics, normality tests are used to determine if a data set is well-modeled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed [72,73].

Table 2 shows that the data were normally distributed.

Table 2. Normal Distribution of Data.

		Knowledge	Attitude	Practice	Independent
N		257	257	257	257
Normal Parameters	Mean	3.8303	3.9864	1.7243	3.1803
	Std. Deviation	0.73533	0.56988	0.36325	0.37910
Most Extreme Differences	Absolute	0.113	0.109	0.112	0.127
	Positive	0.082	0.094	0.075	0.071
	Negative	−0.113	−0.109	−0.112	−0.127
Test Statistic		0.113	0.109	0.112	0.127
Asymp. Sig. (2-tailed)		0.000	0.000	0.000	0.000

4.4. Goodness-of-Fit Statistics

The correlation coefficients were positive and significant at the 0.05 level for all variable pairings. Table 3 provides a summary of the goodness-of-fit statistics and all of the indices fall within the

recommended ranges, which support a claim of good fit for the model. In particular, the relative normed χ^2 value of 2.423 is less than the recommended maximum value of 3.00 [74], which represents a good fit.

Table 3. Model Fit indices.

Indicator	Recommended Value	Value
χ^2	$p \leq 0.05$	$p = 0.000$
RMSEA	$p \leq 0.08$	$p = 0.062$
GFI	$p \geq 0.90$	$p = 0.909$
AGFI	$p \geq 0.90$	$p = 0.853$
NFI	$p \geq 0.90$	$p = 0.906$
IFI	$p \geq 0.90$	$p = 0.927$
CFI	$p \geq 0.90$	$p = 0.926$
Normed χ^2	1–2	1.423

The RMSEA value of 0.062, which is below the recommended maximum of 0.080 suggested by Bollen and Long [75], also suggests that the measurement model fits well. The GFI value of 0.909 and the AGFI value of 0.853 are both acceptable according to Byrne [76]. This research also used IFI and CFI to measure the goodness-of-fit of the models; the IFI (0.927) and CFI (0.926) index values for the measurement model both exceed the recommended level of 0.900 [76], which suggests adequate fit of the model [77]. The NFI value of 0.906 also suggests a reasonable fit.

4.5. Characteristics of Study Sample

This section shows the characteristics of the sample, including nationality, age, years of work experience, educational level, and job position). See Table 4 below for further details.

Table 4. Description of the Study Sample According to the Demographic Variables.

Variable	Level/Category	Number	Percentage %
Nationality	Jordanian	149	58.0%
	Non-Jordanian	108	42.0%
	Total	257	100%
Age	Less than 25	49	19.1%
	From 25 to less than 35	70	27.2%
	From 35 to less than 45	52	20.2%
	From 45 to less than 55	48	18.7%
	More than 55 Years	38	14.8%
	Total	257	100%
Years of Experience	Less than 5	98	38.1%
	From 5 to less than 10	86	33.5%
	From 10 to less than 15	39	15.2%
	More than 15 years	34	13.2%
	Total	257	100%
Educational Level	Vocational Training	12	4.7%
	Diploma	52	20.2%
	Bachelor's	169	65.8%
	Post Graduate	24	9.3%
	Total	257	100%

Table 4. *Cont..*

Variable	Level/Category	Number	Percentage %
	Factory Manager	10	3.8%
	Production Manager	42	16.4%
Job Position	Sales & Marketing Manager	33	12.8%
	Line Supervisor	87	33.9%
	Logistics Manager	41	15.9%
	Product Manager (Design & Quality Assurance)	44	17.2%
	Total	**257**	**100%**

5. Research Analysis and Results

5.1. Mean and Standard Deviation

Table 5 shows the results and statistical analysis, including the results of the descriptive statistics, which are the mean and the standard deviations.

Table 5. Mean and Standard Deviations of Independent and dependent Variables.

Variables	Mean	Standard Deviation	Importance	Ranks
Knowledge	3.830	0.735	High	2
Attitude	3.986	0.569	High	1
Practice	1.724	0.963	Low	3
Green Fashion Innovation	2.122	0.975	Low	4

Table 5 shows the averages of the respondents' answers to the "independent variables". The first variable is Attitude with an average of 3.986 and a high rating, then Knowledge with an average of 3.83 and a high rating. Finally, Practice had an average of 1.72 and a low rating. On the other hand, the dependent variable represented by green fashion innovation resulted in an average of 2.122. However, Table 6 indicates the mean and standard deviations of research items.

Table 6. Mean and Standard Deviations of Research Items.

Variables	Mean	Standard Deviation	Importance	Ranks
Knowledge: I have good knowledge about:				
The green fashion concept	4.10	0.692	High	1
Recycling	3.78	0.853	High	5
Electricity consumption	3.81	1.017	High	3
Government regulations for CO_2 emissions, pollution, and non-biodegradable materials	3.74	1.027	High	8
The fact that adopting green innovation will give your company a sustainable competitive advantage	3.78	0.939	High	6
That water and soil pollution from toxic chemicals used to produce and dye fabrics have serious consequences for communities located near production sites	3.77	1.003	High	7
Green machines and equipment for assembly lines that are environmentally-friendly	3.80	1.040	High	4
Green raw materials that contain organic components and decompose safely	3.86	0.880	High	2

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Table 6. *Cont.*

Variables	Mean	Standard Deviation	Importance	Ranks
Attitude: I prefer to				
Be a pioneer in green fashion innovation	3.89	0.893	High	4
Have awareness of green and innovative ideas for saving the environment and atmosphere	3.92	0.907	High	3
Have special chimneys and solar energy to minimize environmental pollution	3.77	0.967	High	8
Use innovative ways to get rid of materials resulting from the manufacturing process	3.89	0.921	High	5
Be a pioneer in using green methods in designs, transportation, manufacturing, distribution, and waste management	3.81	0.944	High	7
Use green equipment in the manufacturing process to support the environment	3.82	0.928	High	6
Use organic raw materials to nurture the environment instead of using synthetic fibers and concentrated cotton generation	4.47	0.523	High	1
Recycle vintage clothes and remaining fabrics	4.32	0.618	High	2
Practice: Our practices				
Train employees for better environmental performance	1.60	0.545	low	14
Have visible communication about green practices	1.60	0.578	low	15
Involve participating in environmental campaigns	1.67	0.563	low	9
Use solar energy resources as a substitute for the electricity in intermittent use areas	1.66	0.550	low	12
Establish a system for prompt disposal of packaging materials and crates to reduce wastage	1.75	0.595	low	4
Establish an active recycling program for materials in all sections of the factory	1.69	0.568	low	8
Utilize environmentally responsible cleaners throughout the property	1.79	0.577	low	3
Include having energy-saving bulbs in all rooms	1.74	0.576	low	5
Include putting green labels information on each product	1.67	0.576	low	10
Provide environmentally friendly products (i.e., low toxicity, organic, or locally grown\made)	1.73	0.620	low	6

Table 6. *Cont.*

Variables	Mean	Standard Deviation	Importance	Ranks
Encourage conducting business with environmentally friendly service providers	1.73	0.640	low	7
During the transport process, unleaded fuel is used	1.67	0.623	low	11
Use green ideas while designing garments	1.63	0.630	low	13
Use green raw materials (i.e., low toxicity, organic, or locally grown\made) in production	2.00	0.702	low	1
Use waste management in the company to recycle materials resulting from the manufacturing process	1.94	0.691	low	2
Green Fashion Innovation: We adopt Green Fashion Innovation to				
Reduce institutional pressure (e.g., from the Ministry of the Environment)	2.80	1.040	Medium	4
Help achieve a better future	2.86	0.880	Medium	3
Build a relative advantage	2.89	0.893	Medium	2
Improve our economic performance	2.92	0.907	Medium	1
Improve our environment performance	1.74	1.027	Low	7
Achieve our social responsibility	1.78	0.939	Low	5
Achieve market satisfaction.	1.77	1.003	Low	6

Table 6 shows that averages of respondents' answers to the "Knowledge" were in the range 3.74–4.10, with the first being statement (1), which states: "Our company has a good level of knowledge about the green fashion concept" with an average of 4.10 and a high rating, while the last statement (4), which stated "Our company has a good level of knowledge about government regulations for CO_2 emissions, pollution, and non-biodegradable materials" with an average of 3.74 and a high rating. Table 6 shows that averages of respondents' answers for "Attitude" were 3.77–4.47, the first being statement (15), which states: "I prefer to use organic raw materials to nurture the environment instead of using synthetic fibers and concentrated cotton generation" with an average of 4.47 and a high rating, while the last statement (11), which stated "I like to have special chimneys and solar energy to minimize environmental pollution" had an average of 3.77 and a high rating. Table 6 shows that averages of respondents' answers to the "Practice" were in the range 1.60–2.00, the first being statement (30), which states: "Our company is using green raw materials (i.e., low toxicity, organic or locally grown\made materials) in production" with an average of 2.00 and a low rating. The last statements (17,18) said "Our company trains employees to achieve a better environmental performance" and "Our company has visible communication about green practices" with an average of 1.60 and a low rating. Table 6 shows that averages of respondents' answers to the "Green Fashion Innovation Adoption" were in the range of 1.74–2.92, the first being statement (35), which states: "We adopted green fashion innovation to improve our economic performance" with an average of 2.92 and a medium rating. The last statement (36) stated "We adopted green fashion innovation to improve our environment performance" with an average of 1.74 and a low rating.

5.2. Hypotheses Testing

Hypothesis 1. (H1) *There is no statistically significant impact of (KAP) knowledge, attitude, and practice on the adoption of green fashion innovation at α ≤ 0.05.*

A simple linear regression test was conducted to investigate hypotheses H1a–H1c, and the results of the test are shown in Table 7. From the Table, the R-value represents the simple correlation and is 0.347, which indicates that the relationship between two variables is generally considered a good

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impact size. The R^2 value indicates how much of the total variation in the success of Green Fashion Innovation Adoption can be explained by KAP. In this case, 12% can be explained; other variables which can explain the remaining proportion (88%) are not included in the regression model.

Table 7. Simple Linear Regression Analysis to Ensure the Impact of KAP on the Adoption of Green Fashion Innovation.

Dependent Variable	Model Summary		ANOVA			Coefficient		
	R	R^2	F	df	Sig.	β	t	Sig.
Adoption of Green Fashion Innovation	0.347	0.120	22.314	1	0.000	0.347	3.188	0.001

The ANOVA table provides an F-test to determine whether the model is a good fit for the data. According to this *p*-value, it is. Because F (1256 degrees of freedom) = 22.314 ($p \leq 0.05$), this indicates that, overall, the regression model is statistically significant (a good fit for the relationship between KAP and the Adoption of Green Fashion Innovation).

The coefficients table provides the necessary information to predict the Adoption of Green Fashion Innovation from various KAP, as well as to determine whether KAP contribute statistically significantly to the model. Besides, Beta values for Green Fashion Innovation Adoption reached 0.347, which indicates the prediction of 34.7% of the Green Fashion Innovation Adoption from KAP. In other words, the results can be interpreted as for every unit increase in KAP, there is a prediction of a 34.7% unit increase in the Green Fashion Innovation Adoption.

Based on these results, the null hypothesis should be rejected and the alternative hypothesis accepted.

This general hypothesis includes three sub-hypotheses:

Hypothesis 1a. (H1a) *There is no statistically significant impact of knowledge on the adoption of green fashion innovation at α ≤ 0.05.*

Hypothesis 1b. (H1b) *There is no statistically significant impact of attitude on the adoption of green fashion innovation at α ≤ 0.05.*

Hypothesis 1c. (H1c) *There is no statistically significant impact of practice on the adoption of green fashion innovation at α ≤ 0.05.*

To test these hypotheses, the researchers used multiple regression analysis to assess the impact of KAP (knowledge, attitude, and practices) on the Adoption of Green Fashion Innovation, as shown in Table 8.

Table 8. The Multiple Regression Coefficients.

Dependent Variable	(R)	(R^2)	F	DF	Sig	β		T	Sig
Adoption of Green Fashion Innovation	0.319	0.032	14.234	1.256	0.001	Knowledge	0.855	24.808	0.000
						Attitude	0.210	4.727	0.000
						Practice	0.039	1.043	0.298

Table 8 shows the impact of KAP (Knowledge, Attitude, and Practices) on the Adoption of Green Fashion Innovation. The regression model achieved a high degree of fit, as reflected by the R and R^2 values 0.319, 0.032, which asserted that 32% of the explained variation in Green Fashion Innovation Adoption could be accounted for by KAP (Knowledge, Attitude, and Practices). The Table shows

that Knowledge and Attitude have a statistically significant impact (0.00), which is less than the 0.05 toward the achievement of green fashion innovation adoption. The research accepted the alternative hypotheses and rejected the null hypotheses. In contrast, Practice had no statistically significant impact. The research rejected the alternative hypothesis and accepted the null hypothesis.

6. Discussion, Conclusions, and Recommendations

6.1. Discussion: KAP and Open Innovation

The results of the general hypothesis found a statistically significant impact of KAP (knowledge, attitude, and practice) on the adoption of green fashion innovation. The value of the correlation coefficient of KAP and the variable (green fashion innovation adoption) was 34.7%. Additionally, the value of Beta was 0.347, which means that there was an impact of KAP on the adoption of green fashion innovation. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

Jansson [78] revealed that parent's knowledge, attitude, and practices were beneficial when those structural factors were favorable for family and community groups, such as social status, employment, capacity or inability to contribute and participate, and vice versa. The same idea can, therefore, be translated here that KAP has a positive impact on the adoption of green fashion innovation.

The present study also matched the findings of Chaturvedi and Singh [79], which revealed that knowledge, attitude, and practices were significantly changed before and after the CAD incident. A strong association exists between awareness and attitudes. Such an association has been statistically established between knowledge and smoking in male subjects, as has the association between attitudes and weight loss in female patients.

For the first sub-hypothesis, the results show that there is a statistically significant impact of knowledge on the adoption of green fashion innovation. The present research agreed with Cervellon and Wernerfelt's [30] study which found a change in the quality of knowledge between the two cycles of sustainability and style. As communities mature, they are keen to scrutinize the sustainable supply chain and publish accurate information about it by covering various different aspects. New members of the community receive encouragement from established members and thus the trend towards green fashion grows. There is also an alignment between the findings of the current study and those of Husain et al. [80] in that intervention improved knowledge. Moreover, Craig and Allen [27] found that further information was actively sought by those who see sustainability to be a highly influential issue if their businesses are to remain successful over the long haul.

For the second sub-hypothesis, the results show that there is a statistically significant impact of attitude on the adoption of green fashion innovation. Correlation was found with the work of Vehmas et al. [2] in that there has been a rise in consumer interest in recycling and green solutions. Consumers are trying to gain more tangible and realistic data on the environmental aspects of textile manufacturing and how their actions have influenced them. In addition to consumers, top management has an interest in and an attitude towards recycling and green solutions. Moreover, Suki's study [81] found that green brand awareness influenced the attitude of customers towards green products. Furthermore, Mohiuddin et al. [82] examined how the level of environmental knowledge and awareness among business students influences their positive attitudes to green vehicles, and found that there was a significant correlation. The results of this current study align with these findings.

For the third sub-hypothesis, the results found no statistically significant impact of practice on the adoption of the adoption green fashion innovation adoption. The researchers likened these findings to those of Songlar et al. [11] who conducted a study concerning the impact of emergency situation training. They found that participants had a good knowledge of and attitude toward earthquake safety and security. Nevertheless, their practices regarding earthquake preparation was inadequate due to low levels of training. The same situation was present in this study in that

manufacturers have high relevant knowledge and positive attitudes, but exhibit low or no relevant practices. Furthermore, Bano et al. [70] found that promoting awareness and developing proper attitudes was necessary for a change in practice, in contrast to the current study which found that manufacturers in Jordan lagged in practice. For example, more than 70% of manufacturing firms claim that they are manufacturing sustainable products, promoting environmental cleanup ventures, and trying to reduce energy use during manufacturing.

6.2. Conclusions

This research explored the concept of green fashion innovation adoption in Jordan, and investigated the impact of knowledge, attitude, and practice on the adoption of such innovation. This correlation of these variables was the first such study in Jordan.

This research concluded that garment companies in Jordan possess a good knowledge of the green fashion concept, green raw materials that contain organic components and decompose safely, how to manage electricity consumption in efficient and effective ways, green machines and equipment for assembly line that is environmentally-friendly, and recycling. They are aware that there is a problem with water and soil pollution from toxic chemicals that are used to produce and dye fabrics. The release of these chemicals into the environment has severe consequences for the communities that are located near production sites. Finally, they are fully acquainted with the government regulations regarding CO_2 emissions and the control of pollution by non-biodegradable materials. Importantly, they know that the adoption of green practices can give them a competitive advantage in the fast-moving fashion market.

Moreover, the research found that garment companies in Jordan prefer to use organic raw materials to nurture the environment, instead of using synthetic fibers and concentrated cotton generation. They are prepared to adopt the concepts of recycling vintage clothes and leftover fabrics, and are aware of green and innovative ideas to save the environment and atmosphere. In a country like Jordan, with a warm and sunny climate, solar power is an obvious solution when seeking to reduce the use of fossil fuels and minimize environmental pollution.

Unfortunately, this research found that, up until the present time, the green practices actually adopted by Jordanian garment companies remain limited. Low toxicity organic or locally grown/produced raw materials could be used in production, but currently their use is minimal because such materials are not readily available. There is a lack of waste management in companies to recycle materials resulting from the manufacturing process. Efforts need to be made to utilize environmentally responsible cleaners throughout a property, establish a system for prompt disposal of packaging materials and crates to reduce wastage, have energy-saving bulbs in all rooms, establish active recycling programs for materials in all sections of a factory, participate in environmental campaigns, put green label information on each product, use solar energy resources as a substitute for other electricity, introduce green ideas during the design phase, and train employees for better environmental performance.

Alongside the other factors, the study shows that the adoption of green fashion innovation was influenced by the desire to improve economic performance and achieve market satisfaction among consumers, as well as building a relative advantage while taking into consideration future consequences. Companies also seek to reduce institutional pressure (e.g., from the Ministry of Environment), while they also see the necessity of shouldering social responsibility by improving their environmental performance. Furthermore, a study was conducted by de Araújo Burcharth et al. [83] stated that open innovation practices are related to employees' attitudes to knowledge. Thus, negative attitudes to sharing knowledge negatively influence the use of open innovation practices. Therefore, company's policy can be set to provide specific types of training programs in order to increase the impact of positive attitudes toward open innovation practices. Additionally, Management can specify an important intraorganizational antecedent of openness, by indicating that employees' attitudes indeed contribute to the understanding of the variance in the adoption of open innovation. Also, a company's culture for open innovation dynamics can reduce the barriers to openness. Entrepreneurial cyclical dynamics of

open innovation can enhance their development activities such as employee training, which have the potential to mitigate the impact of undesirable attitudes via learning mechanisms and the adoption of new technology. The management paradigm of open innovation may decrease the role of negative attitudes as barriers to the implementation of management strategies, specifically open innovation strategies in the context of garment sectors in order to praise openness in general.

6.3. Recommendations

This study proffers the following recommendations for top management of Jordanian garment companies. Each company should conduct additional research company to address the specific issues related to going green in the manufacturing process. Also, companies should participate in environmental campaigns to increase awareness about environmentally-friendly fashion among their employees and society at large. All organizations should recognize the importance of knowledge management, and in particular those that undertake green projects need to carefully monitor their employees' information sources. It is necessary to increase the interest of corporate management leaders in studying and understanding the characteristics and dimensions of effective knowledge management processes, through which companies develop and grow, as well as how to manage these dimensions in a manner that achieves their development and growth. In addition, flexible strategies should be adopted to harmonize the internal activities of the company with the variables of its business environment. Alternative plans and programs that can be used in the event of any change in the environment should be developed.

Training programs should be developed for employees to give them a complete picture of practices involved with the adoption of green fashion innovation and environmental conservation. This will contribute to improving the organizational structure, and thus ensure a company's continuity in keeping up with developments and increasing market share. Waste management programs should be established to recycle materials resulting from the manufacturing process.

6.4. Research Limitations

One of the limitations of this study is geographic, as the research was limited to companies in only three Jordanian cities, namely Amman, Zarqa, and Irbid. More comprehensive results would be achieved if the study sample was expanded to include garment companies based in other cities. Furthermore, this research only considered the situation in Jordan, whereas the achieved findings might differ in other countries. In addition, only the three variables of knowledge, attitude, and practice were assessed. There is a possibility of introducing numerous other variables and investigating them in the field of adoption of green fashion innovation.

References

1. Birchi, B.A. Assessing university students' attitude toward green computing practices. In Proceedings of the International Conference on Future Computational Technologies, Singapore, 29–30 March 2015.
2. Vehmas, K.; Raudaskoski, A.; Heikkilä, P.; Harlin, A.; Mensonen, A. Consumer attitudes and communication in circular fashion. *J. Fash. Mark. Manag. Int. J.* **2018**, *22*, 286–300. [CrossRef]

3. Neak, S.; Robertson, R. Globalization and Working Conditions: Evidence from Cambodia. In *Globalization, Wages, and the Quality of Jobs: Five Country Studies*; Robertson, R., Brown, D., Pierre, G., Sanchez-Puerta, M., Eds.; World Bank: Washington, DC, USA, 2009.

4. Green Strategy. What Is Sustainable Fashion? 2019. Available online: http://www.greenstrategy.se/sustainable-fashion/what-is-sustainable-fashion (accessed on 3 October 2020).

5. Caniato, F.; Caridi, M.; Crippa, L.; Moretto, A. Environmental sustainability in fashion supply chains: An exploratory case based research. *Int. J. Prod. Econ.* **2012**, *135*, 659–670. [CrossRef]

6. Wu, K.-J.; Liao, C.-J.; Tseng, M.-L.; Chiu, A. Exploring decisive factors in green supply chain practices under uncertainty. *Int. J. Prod. Econ.* **2015**, *159*, 147–157. [CrossRef]

7. Li, G.; Lim, M.K.; Wang, Z. Stakeholders, green manufacturing, and practice performance: Empirical evidence from Chinese fashion businesses. *Ann. Oper. Res.* **2019**, *290*, 961–982. [CrossRef]

8. Wu, L.; Subramanian, N.; Abdulrahman, M.D.; Liu, C.; Lai, K.-H.; Pawar, K.S. The Impact of Integrated Practices of Lean, Green, and Social Management Systems on Firm Sustainability Performance—Evidence from Chinese Fashion Auto-Parts Suppliers. *Sustainability* **2015**, *7*, 3838–3858. [CrossRef]

9. Lee, E.J.; Choi, H.; Han, J.; Kim, D.H.; Ko, E.; Kim, K.H. How to "Nudge" your consumers toward sustainable fashion consumption: An fMRI investigation. *J. Bus. Res.* **2020**, *117*, 642–651. [CrossRef]

10. Bose, R. Knowledge management metrics. *Ind. Manag. Data Syst.* **2004**, *104*, 457–468. [CrossRef]

11. Songlar, T.; Laor, P.; Chomchoe, C.; Khunthason, S. Knowledge, attitude and practice (KAP) of earthquake preparedness amongst the elderly in risk areas. *J. Health Res.* **2019**, *33*, 2–13. [CrossRef]

12. Usai, A.; Scuotto, V.; Murray, A.; Fiano, F.; Dezi, L. Do entrepreneurial knowledge and innovative attitude overcome "imperfections" in the innovation process? Insights from SMEs in the UK and Italy. *J. Knowl. Manag.* **2018**, *22*, 1637–1654. [CrossRef]

13. Kagaari, J.; Munene, J.C.; Ntayi, J.M. Performance management practices, employee attitudes and managed performance. *Int. J. Educ. Manag.* **2010**, *24*, 507–530. [CrossRef]

14. Chang, C.; Chen, Y. Green organizational identity and green innovation. *Manag. Decis.* **2013**, *51*, 1056–1070. [CrossRef]

15. Shahzad, M.; Qu, Y.; Javed, S.A.; Zafar, A.U.; Rehman, S.U. Relation of environment sustainability to CSR and green innovation: A case of Pakistani manufacturing industry. *J. Clean. Prod.* **2020**, *253*, 119938. [CrossRef]

16. Rogers, E.M. *Diffusion of Innovations*, 5th ed.; Free Press: New York, NY, USA, 2003.

17. Cruz, L.B.; Boehe, D. CSR in the global marketplace. *Manag. Decis.* **2008**, *46*, 1187–1209. [CrossRef]

18. Allport, G.W. Attitudes. In *A Handbook of Social Psychology*; Clark University Press: Worcester, MA, USA, 1935.

19. Chen, T.B.; Chai, L.T. Attitude towards the environment and green products: Consumers' perspective. *Manag. Sci. Eng.* **2010**, *4*, 27–39.

20. Ho, H.P.-Y.; Choi, T.-M. A Five-R analysis for sustainable fashion supply chain management in Hong Kong: A case analysis. *J. Fash. Mark. Manag. Int. J.* **2012**, *16*, 161–175.

21. Hartmann, P.; Ibáñez, V.A.; Sainz, F.J.F. Green branding effects on attitude: Functional versus emotional positioning strategies. *Mark. Intell. Plan.* **2005**, *23*, 9–29. [CrossRef]

22. Abu Zayyad, H.M.; Obeidat, Z.M.; Alshurideh, M.T.; Abuhashesh, M.; Maqableh, M.; Masa'Deh, R. Corporate social responsibility and patronage intentions: The mediating effect of brand credibility. *J. Mark. Commun.* **2020**, 1–24. [CrossRef]

23. Fernando, A.G.; Sivakumaran, B.; Suganthi, L. Message involvement and attitude towards green advertisements. *Mark. Intell. Plan.* **2016**, *34*, 863–882. [CrossRef]

24. Moser, A.K. Thinking green, buying green? Drivers of pro-environmental purchasing behavior. *J. Consum. Mark.* **2015**, *32*, 167–175. [CrossRef]

25. Lee, B. The determinants of consumer attitude toward service innovation—The evidence of ETC system in Taiwan. *J. Serv. Mark.* **2012**, *26*, 9–19. [CrossRef]

26. Strategic Direction. Barriers to innovation: The right attitude and metrics. *Strateg. Dir.* **2007**, *23*, 33–35. [CrossRef]

27. Craig, C.A.; Allen, M.W. Sustainability information sources: Employee knowledge, perceptions, and learning. *J. Commun. Manag.* **2013**, *17*, 292–307. [CrossRef]

28. Hartmann, P.; Ibáñez, V.A. Green value added. *Mark. Intell. Plan.* **2006**, *24*, 673–680. [CrossRef]

29. Haden, S.; Oyler, J.; Humphreys, J. Historical, practical, and theoretical perspectives on green management: An exploratory analysis. *Manag. Decis.* **2009**, *47*, 1041–1055. [CrossRef]

30. Cervellon, M.; Wernerfelt, A. Knowledge sharing among green fashion communities online: Lessons for the sustainable supply chain. *J. Fash. Mark. Manag.* **2012**, *16*, 176–192. [CrossRef]

31. Keskin, D.; Wevesr, R.; Brezet, H. Product innovation processes in sustainability-oriented ventures: A study of effectuation and causation. *J. Clean. Prod.* **2020**, *263*, 121210. [CrossRef]

32. Hur, E.S. Design and Optimisation of a User-Engaged System for Sustainable Fashion. Ph.D. Thesis, The University of Leeds School of Design, Leeds, UK, 2014. Available online: https://core.ac.uk/download/pdf/42604193 (accessed on 3 October 2020).

33. Roffe, I. Innovation and creativity in organisations: A review of the implications for training and development. *J. Eur. Ind. Train.* **1999**, *23*, 224–241. [CrossRef]

34. Cervellon, M.; Carey, L. Consumers' perceptions of 'green': Why and how consumers use eco-fashion and green beauty products. *Crit. Stud. Fash. Beauty* **2011**, *2*, 77–98. [CrossRef]

35. Kozlowski, A.; Searcy, C.; Bardecki, M. Innovation for a sustainable fashion industry: A design focused approach toward the development of new business models. In *Green Fashion. Environmental Footprints and Eco-Design of Products and Processes*; Muthu, S.S., Gardetti, M., Eds.; Springer: Singapore, 2016; pp. 151–170.

36. Morgan, L.R.; Birtwistle, G. An investigation of young fashion consumers' disposal habits. *Int. J. Consum. Stud.* **2009**, *33*, 190–198. [CrossRef]

37. HKTDC. Green in vogue. Hong Kong Trader: International Edition. Retrieved. 2009. Available online: www.hktdc.com/info/mi/a/hkti/en/1X00QZAT/1/Hong-Kong-Trader---InternationalEdition/Green-in-Vogue.htm (accessed on 3 October 2020).

38. Shedroff, N. *Design Is the Problem*; Rosenfeld Media, LLC: New York, NY, USA, 2009.

39. Powell, I.; Prostko-Bell, C. *Leveraging EHS Data and Tools for a Safer and Greener Supply Chain*; EHS Today: Cleveland, OH, USA, 2010; pp. 27–29.

40. Ewing, T. Forum—Participation Cycles and Emergent Cultures in an Online Community. *Int. J. Mark. Res.* **2008**, *50*, 575–590. [CrossRef]

41. Fisher, T.; Cooper, T.; Woodward, S.; Hiller, A.; Goworek, H. *Public Understanding of Sustainable Clothing. Report to the Department for Environment Food and Rural Affairs*; Nottingham Trent University: Nottingham, UK; Sheffield Hallam University: Sheffield, UK, 2008.

42. Anderson, R.A. Climbing mount sustainability. *Qual. Prog.* **2004**, *37*, 32–37. [CrossRef]

43. Luzio, J.P.P.; Lemke, F. Exploring green consumers' product demands and consumption processes. *Eur. Bus. Rev.* **2013**, *25*, 281–300. [CrossRef]

44. Kozar, J.M.; Connell, K.Y.H. Socially and environmentally responsible apparel consumption: Knowledge, attitudes, and behaviors. *Soc. Responsib. J.* **2013**, *9*, 315–324. [CrossRef]

45. Abuhashesh, M.; Al-Khasawneh, M.; Al-Dmour, R.; Masa'Deh, R. The Impact of Facebook on Jordanian Consumers' Decision Process in the Hotel Selection. *IBIMA Bus. Rev.* **2019**, 1–16. [CrossRef]

46. Wu, W.-Y.; Sukoco, B.M. Why should I share? Examining consumers' motives and trust on knowledge sharing. *J. Comput. Inf. Syst.* **2010**, *50*, 11–19.

47. Albourini, F.; Ahmad, A.M.K.; Abuhashesh, M.; Nusairat, N.M. The effect of networking behaviors on the success of entrepreneurial startups. *Manag. Sci. Lett.* **2020**, *10*, 2521–2532. [CrossRef]

48. Solaja, O.M.; Adetola, O.B.; Badejo, B.A.; Okafor, E.E. Knowledge of Green Practices Adoption and Infusion among Employees' of Selected Manufacturing Firms in Ogun State, Nigeria. *Sriwij. J. Environ.* **2019**, *4*, 146–156. [CrossRef]

49. Chi, T. Consumer perceived value of environmentally friendly apparel: An empirical study of Chinese consumers. *J. Text. Inst.* **2015**, *106*, 1038–1050. [CrossRef]

50. Marjanovic, S.; Altenhofer, M.; Hocking, L.; Chataway, J.; Ling, T. Innovating for improved healthcare: Sociotechnical and innovation systems perspectives and lessons from the NHS. *Sci. Public Policy* **2020**, *47*, 283–297. [CrossRef]

51. Hartmann, P.; Apaolaza-Ibáñez, V. Consumer attitude and purchase intention toward green energy brands: The roles of psychological benefits and environmental concern. *J. Bus. Res.* **2012**, *65*, 1254–1263. [CrossRef]

52. Harris, F.; Roby, H.; Dibb, S. Sustainable clothing: Challenges, barriers and interventions for encouraging more sustainable consumer behavior. *Int. J. Consum. Stud.* **2016**, *40*, 309–318. [CrossRef]

53. Carey, L.; Cervellon, M. Ethical fashion dimensions: Pictorial and auditory depictions through three cultural perspectives. *J. Fash. Mark. Manag.* **2014**, *18*, 483–506. [CrossRef]

54. Niinimäkia, K. Eco-clothing, consumer identity and ideology. *Sustain. Dev.* **2010**, *18*, 150–162. [CrossRef]

55. Niinimäkia, K.; Hassi, L. Emerging design strategies in sustainable production and consumption of textiles and clothing. *J. Clean. Prod.* **2011**, *19*, 1876–1883. [CrossRef]

56. Abuhashesh, M.; Al-Dmour, R.; Masa'deh, R. Factors that impact job satisfaction and performance among employees in the Jordanian industrial sector. In Proceedings of the 32nd International Business Information Management Association Conference, IBIMA, IBIMA, Seville, Spain, 15–16 November 2018; pp. 4285–4305.

57. Mele, C.; Russo-Spena, T. Eco-innovation practices. *J. Organ. Chang. Manag.* **2015**, *28*, 4–25. [CrossRef]

58. Rutter, C.; Armstrong, K.; Cano, M.B. The epiphanic sustainable fast fashion epoch. In *Sustainability in fashion: A Cradle to Upcycle Approach*; Henninger, C.E., Alevizou, P.J., Goworek, H., Ryding, D., Eds.; Springer: Berlin/Heidelberg, Germany, 2017; pp. 11–30.

59. Ramanathan, R.; Ko, L.W.L.; Chen, H.; Ramanathan, U. A Study on Green Characteristics of RFID using Innovation Diffusion Theory. In *Information Diffusion Management and Knowledge Sharing: Breakthroughs in Research and Practice*; IGI Global: Hershey, PA, USA, 2020; pp. 1–12. Available online: https://www.researchgate.net/publication/338313411_A_Study_on_Green_Characteristics_of_RFID_using_Innovation_Diffusion_Theory (accessed on 3 October 2020).

60. Niinimäki, K. Fashion in a circular economy. In *Sustainability in Fashion*; Henninger, C.E., Alevizou, P.J., Goworek, H., Eds.; Springer: Cham, Switzerland, 2017; pp. 151–169.

61. Dahlbo, H.; Aalto, K.; Eskelinen, H.; Salmenperä, H. Increasing textile circulation—Consequences and requirements. *Sustain. Prod. Consum.* **2017**, *9*, 44–57. [CrossRef]

62. Zhu, Q.; Sarkis, J. Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *J. Oper. Manag.* **2004**, *22*, 265–289. [CrossRef]

63. Zhu, Q.; Sarkis, J. The moderating effects of institutional pressures on emergent green supply chain practices and performance. *Int. J. Prod. Res.* **2007**, *45*, 4333–4355. [CrossRef]

64. Sarkis, J.; Zhu, Q.; Lai, K.-H. An organizational theoretic review of green supply chain management literature. *Int. J. Prod. Econ.* **2011**, *130*, 1–15. [CrossRef]

65. Zhu, Q.; Geng, Y.; Sarkis, J.; Lai, K.-H. Evaluating green supply chain management among Chinese manufacturers from the ecological modernization perspective. *Transp. Res. Part. E Logist. Transp. Rev.* **2011**, *47*, 808–821. [CrossRef]

66. Dubey, R.; Gunasekaran, A.; Ali, S.S. Exploring the relationship between leadership, operational practices, institutional pressures and environmental performance: A framework for green supply chain. *Int. J. Prod. Econ.* **2015**, *160*, 120–132. [CrossRef]

67. De Camargo Fiorini, P.; Jabbour, C.J.C. Information systems and sustainable supply chain management towards a more sustainable society: Where we are and where we are going. *Int. J. Inf. Manag.* **2017**, *37*, 241–249. [CrossRef]

68. Dubey, R.; Gunasekaran, A.; Childe, S.J.; Papadopoulos, T.; Hazen, B.T.; Giannakis, M.; Roubaud, D. Examining the effect of external pressures and organizational culture on shaping performance measurement systems (PMS) for sustainability benchmarking: Some empirical findings. *Int. J. Prod. Econ.* **2017**, *193*, 63–76. [CrossRef]

69. Launiala, A. How much can a KAP survey tell us about people's knowledge, attitudes and practices? Some observations from medical anthropology research on malaria in pregnancy in Malawi. *Anthr. Matters* **2009**, *11*, 1–13. [CrossRef]

70. Bano, R.; Al-Shammari, E.; Fatima, S.B.; Al-Shammari, N.A. A comparative study of Knowledge, Attitude, Practice of nutrition and non-nutrition student towards a balanced diet in Hail University. *J. Nurs. Health Sci.* **2013**, *2*, 29–36.

71. Sekaran, U.; Bougie, R. (Eds.) *Research for Business—A Skill Building Approach*; John Wiley & Sons Inc.: Hoboken, NJ, USA, 2010.

72. Chen, I.J.; Paulraj, A. Towards a theory of supply chain management: The constructs and measurements. *J. Oper. Manag.* **2004**, *22*, 119–150. [CrossRef]

73. Dubey, R.; Gunasekaran, A.; Childe, S.J.; Blome, C.; Papadopoulos, T. Big Data and Predictive Analytics and Manufacturing Performance: Integrating Institutional Theory, Resource-Based View and Big Data Culture. *Br. J. Manag.* **2019**, *30*, 341–361. [CrossRef]

74. Bagozzi, R.P. Structural equation models in marketing research: Basic principles. *Princ. Mark. Res.* **1994**, *3*, 7–385.

75. Bollen, K.A.; Long, J.S. *Testing Structural Equation Models*; Sage Publications: Thousand Oaks, CA, USA, 1993.
76. Byrne, B.M. *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*; Lawrence Erlbaum Associated: Mahwah, NJ, USA, 2001.
77. Hu, L.T.; Bentler, P.M. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model. Multidiscip. J.* **1999**, *6*, 1–55. [CrossRef]
78. Jansson, J. Consumer eco-innovation adoption: Assessing attitudinal factors and perceived product characteristics. *Bus. Strat. Environ.* **2011**, *20*, 192–210. [CrossRef]
79. Chaturvedi, R.; Singh, N. Changes in knowledge, attitudes and practices among coronary artery disease patients. *Nutr. Food Sci.* **2012**, *42*, 41–47. [CrossRef]
80. Husain, N.R.N.; Muda, W.A.M.B.W.; Jamil, N.I.N.; Hanafi, N.N.N.; Rahman, R.A. Effect of food safety training on food handlers' knowledge and practices. *Br. Food J.* **2016**, *118*, 795–808. [CrossRef]
81. Suki, N.M. Green product purchase intention: Impact of green brands, attitude, and knowledge. *Br. Food J.* **2016**, *118*, 2893–2910. [CrossRef]
82. Mohiuddin, M.; Al Mamun, A.; Syed, F.A.; Masud, M.M.; Su, Z. Environmental Knowledge, Awareness, and Business School Students' Intentions to Purchase Green Vehicles in Emerging Countries. *Sustainability* **2018**, *10*, 1534. [CrossRef]
83. De Araújo Burcharth, A.L.; Knudsen, M.P.; Søndergaard, H.A. Neither invented nor shared here: The impact and management of attitudes for the adoption of open innovation practices. *Technovation* **2014**, *34*, 149–161. [CrossRef]